# SPEC CPU®2017 Integer Rate Result

Dell Inc.

PowerEdge R750 (Intel Xeon Platinum 8358, 2.60 GHz)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 484</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak = Not Run</td>
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<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>Test Date: Nov-2022</th>
</tr>
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<tbody>
<tr>
<td>Test Sponsor: Dell Inc.</td>
<td>Hardware Availability: May-2021</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
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## Hardware

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
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<tbody>
<tr>
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<tr>
<td>525.x264_r</td>
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### SPECrate®2017_int_base (484)

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## Software

**OS:** Red Hat Enterprise Linux 8.6 (Ootpa)
4.18.0-372.9.1.el8.x86_64

**Compiler:**
C/C++: Version 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2022.1 of Intel Fortran Compiler for Linux;

**Parallel:** No

**Firmware:** Version 1.7.5 released Sep-2022

**File System:** tmpfs

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

**Base Pointers:** 64-bit

**Peak Pointers:** Not Applicable

**Other:** None

**Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage.

---

**Dell Inc.**

PowerEdge R750 (Intel Xeon Platinum 8358, 2.60 GHz)

**CPU Name:** Intel Xeon Platinum 8358

**Max MHz:** 3400

**Nominal:** 2600

**Enabled:** 64 cores, 2 chips, 2 threads/core

**Orderable:** 1.2 chips

**Cache L1:** 32 KB I + 48 KB D on chip per core

**L2:** 1.25 MB I+D on chip per core

**L3:** 48 MB I+D on chip per chip

**Other:** None

**Memory:** 512 GB (16 x 32 GB 2Rx8 PC4-3200AA-R)

**Storage:** 80 GB on tmpfs

**Other:** None
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SPECrate®2017_int_base = 484
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**Results Table**

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<th>Ratio</th>
<th>Seconds</th>
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<td>613</td>
<td>332</td>
<td>613</td>
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<td>353</td>
<td>513</td>
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<tr>
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<td>128</td>
<td>273</td>
<td>758</td>
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<td>755</td>
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<tr>
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<tr>
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<td></td>
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<tr>
<td>531.deepsjeng_r</td>
<td>128</td>
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<td>541.leela_r</td>
<td>128</td>
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<td>540</td>
<td>256</td>
<td>540</td>
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<td></td>
<td></td>
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</table>

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

**Compiler Notes**

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalancbmk_r / 623.xalancbmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

**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 = "/mnt/ramdisk/cpu2017-1.1.8-ic2022.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.8-ic2022.1/lib/ia32:/mnt/ramdisk/cpu2017-1.1.8-ic2022.1/je5.0.1-32"
MALLOC_CONF = "retain:true"
```
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SPECrace®2017_int_peak = Not Run

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

Test Date: Nov-2022
Hardware Availability: May-2021
Software Availability: May-2022

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Red Hat Enterprise Linux 8.4
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>

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.

Benchmark run from a 80 GB ramdisk created with the cmd: "mount -t tmpfs -o size=80G tmpfs /mnt/ramdisk"

Platform Notes

BIOS settings:
- DIMM Self Healing on
- Uncorrectable Memory Error : Disabled
- Virtualization Technology : Disabled
- Sub NUMA Cluster : 2-way Clustering
- DCU Streamer Prefetcher : Disabled
- LLC Prefetch : Disabled
- Dead Line LLC Alloc : Disabled
- Optimizer Mode : Enabled
- System Profile : Custom
- CPU Power Management : Maximum Performance
- C1E : Disabled
- C States : Autonomous
- Memory Patrol Scrub : Disabled
- Energy Efficiency Policy : Performance
- PCI ASPM L1 Link
- Power Management : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.8-ic2022.1/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on auvcetillem1m1.corp.emc.com Sun Nov 13 04:16:19 2022

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 8358 CPU @ 2.60GHz
- 2 "physical id"s (chips)
- 128 "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 : 32
  - siblings : 64
  - physical 0: cores 0 1 2 3 4 5 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
  - 28 29 30 31
  - physical 1: cores 0 1 2 3 4 5 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

(Continued on next page)
28 29 30 31

From lscpu from util-linux 2.32.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 128
On-line CPU(s) list: 0-127
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8358 CPU @ 2.60GHz
BIOS Model name: Intel(R) Xeon(R) Platinum 8358 CPU @ 2.60GHz
Stepping: 6
CPU MHz: 3400.000
CPU max MHz: 3400.0000
CPU min MHz: 800.0000
BogoMIPS: 5200.00
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 49152K

NUMA node0 CPU(s):
0,4,8,12,16,20,24,28,32,36,40,44,48,52,56,60,64,68,72,76,80,84,88,92,96,100,104,108,112,116,120,124

NUMA node1 CPU(s):
2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62,66,70,74,78,82,86,90,94,98,102,106,110,114,118,122,126

NUMA node2 CPU(s):
1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61,65,69,73,77,81,85,89,93,97,101,105,109,113,117,121,125

NUMA node3 CPU(s):

Flags: fpu vme de pse tsc msr pae mce cmovpat 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 cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat_i3 invpcid_single intel_pipn sibd mba ibrs ibpb stibp ibrs_enhanced fsgsbase tsc_adjust bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_nl avx512bw avx512vl xsaveopt xsavec xsetbv1 xsaves cmqm_llc cmqm_occupa_llc cmqm_mbb_total cmqm_mbb_local split_lock_detect wbinvd dtherm ida arat pin pts avx512vmbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_vbitalg tme avx512_vpopcntdq lfsr td pcrs md_clear pconf
flush_lid arch_capabilities

/cache/data

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80 84 88 92 96

(Continued on next page)
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Platform Notes (Continued)

100 104 108 112 116 120 124
node 0 size: 128153 MB
node 0 free: 124942 MB
102 106 110 114 118 122 126
node 1 size: 128975 MB
node 1 free: 125083 MB
node 2 cpus: 1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97
101 105 109 113 117 121 125
node 2 size: 129016 MB
node 2 free: 127284 MB
node 3 cpus: 3 7 11 15 19 23 27 31 35 39 43 47 51 55 59 63 67 71 75 79 83 87 91 95 99
103 107 111 115 119 123 127
node 3 size: 129014 MB
node 3 free: 128014 MB
node distances:
node 0 1 2 3
0: 10 11 20 20
1: 11 10 20 20
2: 20 20 10 11
3: 20 20 11 10

From /proc/meminfo
MemTotal: 527523228 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sbin/tuned-adm active
Current active profile: throughput-performance

/sbin/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

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

NAME="Red Hat Enterprise Linux"
VERSION="8.6 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.6"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.6 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.6 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.6 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8::baseos
uname -a:
Linux auvcetillem1l.corp.emc.com 4.18.0-372.9.1.el8.x86_64 #1 SMP Fri Apr 15 22:12:19 EDT 2022 x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
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

(Continued on next page)
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Platform Notes (Continued)

CVE-2017-5753 (Spectre variant 1):
Mitigation: usercopy/swapgs barriers and __user pointer sanitation

CVE-2017-5715 (Spectre variant 2):
Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

CVE-2020-0543 (Special Register Buffer Data Sampling):
Not affected

CVE-2019-11135 (TSX Asynchronous Abort):
Not affected

run-level 3 Nov 13 04:06
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-ic2022.1
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 80G 3.6G 77G 5% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
Vendor: Dell Inc.
Product: PowerEdge R750
Product Family: PowerEdge
Serial: SLR7598

Additional information from dmidecode 3.3 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:
8x 002C00B3002C 18ASF4G72PDZ-3G2E1 32 GB 2 rank 3200
2x 002C0632002C 18ASF4G72PDZ-3G2E1 32 GB 2 rank 3200
1x 00AD063200AD HMAA4GR7AJR8N-XN 32 GB 2 rank 3200
5x 00CE063200CE M393A4G43AB3-CWE 32 GB 2 rank 3200

BIOS:
BIOS Vendor: Dell Inc.
BIOS Version: 1.7.5
BIOS Date: 09/14/2022
BIOS Revision: 1.7

(End of data from sysinfo program)

Compiler Version Notes

<table>
<thead>
<tr>
<th>C</th>
<th>500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)</th>
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<tr>
<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316 Copyright (C) 1985-2022 Intel Corporation. All rights reserved.</td>
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Compiler Version Notes (Continued)

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Base Portability Flags

500.perlbench_r: --DSPEC_LP64 --DSPEC_LINUX_X64
502.gcc_r: --DSPEC_LP64
505.mcf_r: --DSPEC_LP64
520.omnetpp_r: --DSPEC_LP64
523.xalancbmk_r: --DSPEC_LP64 --DSPEC_LINUX
525.x264_r: --DSPEC_LP64
531.deepsjeng_r: --DSPEC_LP64
541.leela_r: --DSPEC_LP64
548.exchange2_r: --DSPEC_LP64
557.xz_r: --DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math
-fflto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto

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## Base Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/intel64_lin
-lqkmalloc
```

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:


---

**Notes:**

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.

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