



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_int_base = 427

PowerEdge R750 (Intel Xeon Gold 6338, 2.00 GHz)

SPECrate®2017_int_peak = Not Run

CPU2017 License: 55

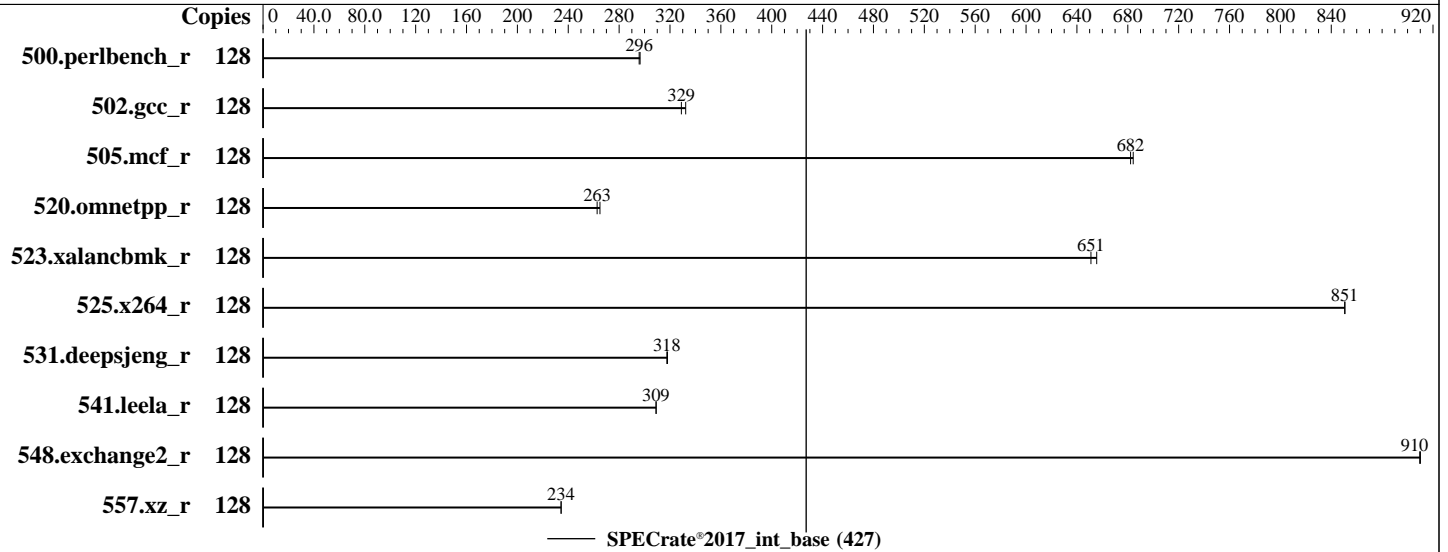
Test Date: Nov-2022

Test Sponsor: Dell Inc.

Hardware Availability: May-2021

Tested by: Dell Inc.

Software Availability: May-2022



Hardware

CPU Name: Intel Xeon Gold 6338
 Max MHz: 3200
 Nominal: 2000
 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

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.



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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	128	689	296	687	296									
502.gcc_r	128	545	332	551	329									
505.mcf_r	128	303	682	302	684									
520.omnetpp_r	128	639	263	634	265									
523.xalancbmk_r	128	206	656	208	651									
525.x264_r	128	264	851	263	851									
531.deepsjeng_r	128	461	318	462	318									
541.leela_r	128	686	309	686	309									
548.exchange2_r	128	368	910	369	910									
557.xz_r	128	590	234	590	234									

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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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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 localhost.localdomain Mon Nov 14 15:54:21 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) Gold 6338 CPU @ 2.00GHz
 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

```

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Platform Notes (Continued)

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) Gold 6338 CPU @ 2.00GHz
BIOS Model name:       Intel(R) Xeon(R) Gold 6338 CPU @ 2.00GHz
Stepping:               6
CPU MHz:                3200.000
CPU max MHz:            3200.0000
CPU min MHz:            800.0000
BogoMIPS:               4000.00
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):     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
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 cpuid
aperfperf pni pclmulqdq dtes64 monitor ds_cpl smx est tm2 sse3 sdbg fma cx16 xtpr
pdc m pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx
f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single
intel_ppin ssbd 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_ni avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves
cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local split_lock_detect wbnoinvd dtherm
ida arat pln pts avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq
avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid fsrm md_clear pconfig
flush_lld arch_capabilities

```

/proc/cpuinfo cache data
cache size : 49152 KB

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

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Platform Notes (Continued)

```

100 104 108 112 116 120 124
node 0 size: 128153 MB
node 0 free: 124035 MB
node 1 cpus: 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
node 1 size: 129016 MB
node 1 free: 126680 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: 128975 MB
node 2 free: 126651 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: 128216 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

```

```

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

```

```

From /etc/*release* /etc/*version*
os-release:
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 localhost.localdomain 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

```

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Platform Notes (Continued)

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

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 14 15:52

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-ic2022.1

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
tmpfs	tmpfs	8G	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

=====
 C | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)

 Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
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=====
 C++ | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)

 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.

=====
 Fortran | 548.exchange2_r(base)

 Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
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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

-flto -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

http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.html
<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.2.html>

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.xml
<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.2.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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