SPEC CPU®2017 Integer Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

$SPECrate^{®}2017\_int\_base = \quad 182$

ThinkEdge SE450
(2.00 GHz, Intel Xeon Gold 6330)
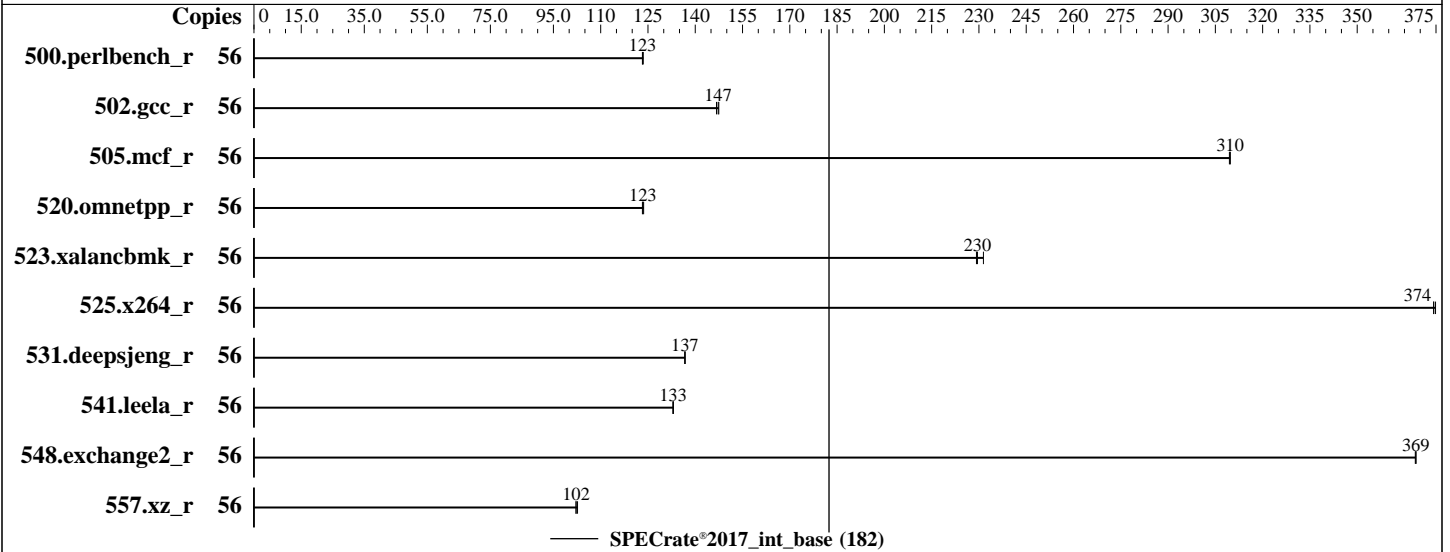
$SPECrate^{®}2017\_int\_peak = Not\ Run$

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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

Benchmark	Copies	Result
500.perlbench_r	56	123
502.gcc_r	56	147
505.mcf_r	56	310
520.omnetpp_r	56	123
523.xalancbmk_r	56	230
525.x264_r	56	374
531.deepsjeng_r	56	137
541.leela_r	56	133
548.exchange2_r	56	369
557.xz_r	56	102

SPECrate®2017_int_base (182)

Hardware

CPU Name: Intel Xeon Gold 6330
  Max MHz: 3100
  Nominal: 2000
Enabled: 28 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1: 32 KB I + 48 KB D on chip per core
  L2: 1.25 MB I+D on chip per core
  L3: 42 MB I+D on chip per chip
Other: None
Memory: 256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R, running at 2933)
Storage: 1 x 960 GB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux 8.5
  (Ootpa)
  Kernel 4.18.0-348.el8.x86_64
Compiler: C/C++: Version 2021.1 of Intel oneAPI DPC++/C++
  Compiler Build 20201113 for Linux;
  Fortran: Version 2021.1 of Intel Fortran Compiler
  Classic Build 20201112 for Linux
Parallel: No
Firmware: Lenovo BIOS Version CME104I 1.01 released Mar-2022
File System: xfs
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

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkEdge SE450
(2.00 GHz, Intel Xeon Gold 6330)

SPECrate®2017_int_base =   182

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017		**Test Date:** May-2022
Test Sponsor: Lenovo Global Technology		**Hardware Availability:** Apr-2022
Tested by: Lenovo Global Technology		**Software Availability:** Nov-2021

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	56	722	124	723	123	**723**	**123**							
502.gcc_r	56	**538**	**147**	538	147	540	147							
505.mcf_r	56	292	309	**292**	**310**	292	310							
520.omnetpp_r	56	596	123	594	124	**595**	**123**							
523.xalancbmk_r	56	256	231	258	229	**258**	**230**							
525.x264_r	56	**262**	**374**	262	374	262	375							
531.deepsjeng_r	56	469	137	470	137	**469**	**137**							
541.leela_r	56	**697**	**133**	698	133	697	133							
548.exchange2_r	56	398	368	398	369	**398**	**369**							
557.xz_r	56	592	102	**592**	**102**	589	103							
SPECrate®2017_int_base =	**182**													
SPECrate®2017_int_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"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
      "/home/cpu2017-1.1.8-ic2021.1-revB/lib/intel64:/home/cpu2017-1.1.8-ic202
      1.1-revB/lib/ia32:/home/cpu2017-1.1.8-ic2021.1-revB/je5.0.1-32"
MALLOC_CONF = "retain:true"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Red Hat Enterprise Linux 8.1
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

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkEdge SE450
(2.00 GHz, Intel Xeon Gold 6330)

SPECrate®2017_int_base =   182

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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

General Notes (Continued)

```
 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.
```

Platform Notes

```
BIOS configuration:
Choose Operating Mode set to Maximum Performance
SNC set to Enabled

 Sysinfo program /home/cpu2017-1.1.8-ic2021.1-revB/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on localhost.localdomain Fri May 20 19:09:57 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 6330 CPU @ 2.00GHz
       1  "physical id"s (chips)
       56 "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 : 28
       siblings  : 56
       physical 0: cores 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

 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):              56
      On-line CPU(s) list: 0-55
      Thread(s) per core:  2
      Core(s) per socket:  28
      Socket(s):           1
      NUMA node(s):        2
      Vendor ID:           GenuineIntel
      BIOS Vendor ID:      Intel(R) Corporation
```

(Continued on next page)

Lenovo Global Technology

ThinkEdge SE450
(2.00 GHz, Intel Xeon Gold 6330)

SPECrate®2017_int_base =   182

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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

Platform Notes (Continued)

```
       CPU family:            6
       Model:                 106
       Model name:            Intel(R) Xeon(R) Gold 6330 CPU @ 2.00GHz
       BIOS Model name:       Intel(R) Xeon(R) Gold 6330 CPU @ 2.00GHz
       Stepping:              6
       CPU MHz:               2000.000
       BogoMIPS:              4000.00
       Virtualization:        VT-x
       L1d cache:             48K
       L1i cache:             32K
       L2 cache:              1280K
       L3 cache:              43008K
       NUMA node0 CPU(s):     0-13,28-41
       NUMA node1 CPU(s):     14-27,42-55
       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
    aperfmperf pni pclmulqdq dtes64 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
    rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single intel_ppin
    ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad
    fsgsbase tsc_adjust sgx bmi1 hle 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 sgx_lc fsrm md_clear pconfig flush_l1d arch_capabilities

 /proc/cpuinfo cache data
    cache size : 43008 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 28 29 30 31 32 33 34 35 36 37 38 39 40 41
   node 0 size: 128608 MB
   node 0 free: 128200 MB
   node 1 cpus: 14 15 16 17 18 19 20 21 22 23 24 25 26 27 42 43 44 45 46 47 48 49 50 51 52
   53 54 55
   node 1 size: 128978 MB
   node 1 free: 128375 MB
   node distances:
   node   0   1
     0:  10  11
     1:  11  10

 From /proc/meminfo
```

(Continued on next page)

Lenovo Global Technology

ThinkEdge SE450
(2.00 GHz, Intel Xeon Gold 6330)

SPECrate®2017_int_base =   182

SPECrate®2017_int_peak = Not Run

Platform Notes (Continued)

```
    MemTotal:        263768692 kB
    HugePages_Total:         0
    Hugepagesize:        2048 kB

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

 From /etc/*release* /etc/*version*
    os-release:
       NAME="Red Hat Enterprise Linux"
       VERSION="8.5 (Ootpa)"
       ID="rhel"
       ID_LIKE="fedora"
       VERSION_ID="8.5"
       PLATFORM_ID="platform:el8"
       PRETTY_NAME="Red Hat Enterprise Linux 8.5 (Ootpa)"
       ANSI_COLOR="0;31"
    redhat-release: Red Hat Enterprise Linux release 8.5 (Ootpa)
    system-release: Red Hat Enterprise Linux release 8.5 (Ootpa)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:8::baseos

 uname -a:
    Linux localhost.localdomain 4.18.0-348.el8.x86_64 #1 SMP Mon Oct 4 12:17:22 EDT 2021
    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
 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 May 20 19:08

 SPEC is set to: /home/cpu2017-1.1.8-ic2021.1-revB
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda4       xfs   819G   26G  793G   4% /home
```

(Continued on next page)

Lenovo Global Technology

SPECrate®2017_int_base =   182

ThinkEdge SE450
(2.00 GHz, Intel Xeon Gold 6330)

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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

Platform Notes (Continued)

```
  From /sys/devices/virtual/dmi/id
       Vendor:          Lenovo
       Product:         ThinkEdge SE450
       Product Family:  ThinkSystem
       Serial:          1234567890

  Additional information from dmidecode 3.2 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 Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200, configured at 2933

  BIOS:
     BIOS Vendor:      Lenovo
     BIOS Version:     CME104I-1.01
     BIOS Date:        03/17/2022
     BIOS Revision:    1.1
     Firmware Revision: 1.10

  (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 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
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 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


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

(Continued on next page)

Lenovo Global Technology

ThinkEdge SE450
(2.00 GHz, Intel Xeon Gold 6330)

SPECrate®2017_int_base =   182

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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

Compiler Version Notes (Continued)

```
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
  Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

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
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/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

(Continued on next page)

Lenovo Global Technology

ThinkEdge SE450
(2.00 GHz, Intel Xeon Gold 6330)

SPECrate®2017_int_base = 182

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017		**Test Date:**	May-2022
Test Sponsor:	Lenovo Global Technology	**Hardware Availability:**	Apr-2022
Tested by:	Lenovo Global Technology	**Software Availability:**	Nov-2021

Base Optimization Flags (Continued)

C++ benchmarks (continued):
```
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-auto -mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/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/Lenovo-Platform-SPECcpu2017-Flags-V1.2-ICElake-J.html
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.html

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

http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-ICElake-J.xml
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.8 on 2022-05-20 07:09:56-0400.
Report generated on 2022-06-21 17:30:33 by CPU2017 PDF formatter v6442.
Originally published on 2022-06-21.