SPEC CPU®2017 Integer Speed Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkEdge SR860 V2
(2.90 GHz, Intel Xeon Platinum 8380H)

$SPECspeed^{®}2017\_int\_base =$ 12.6
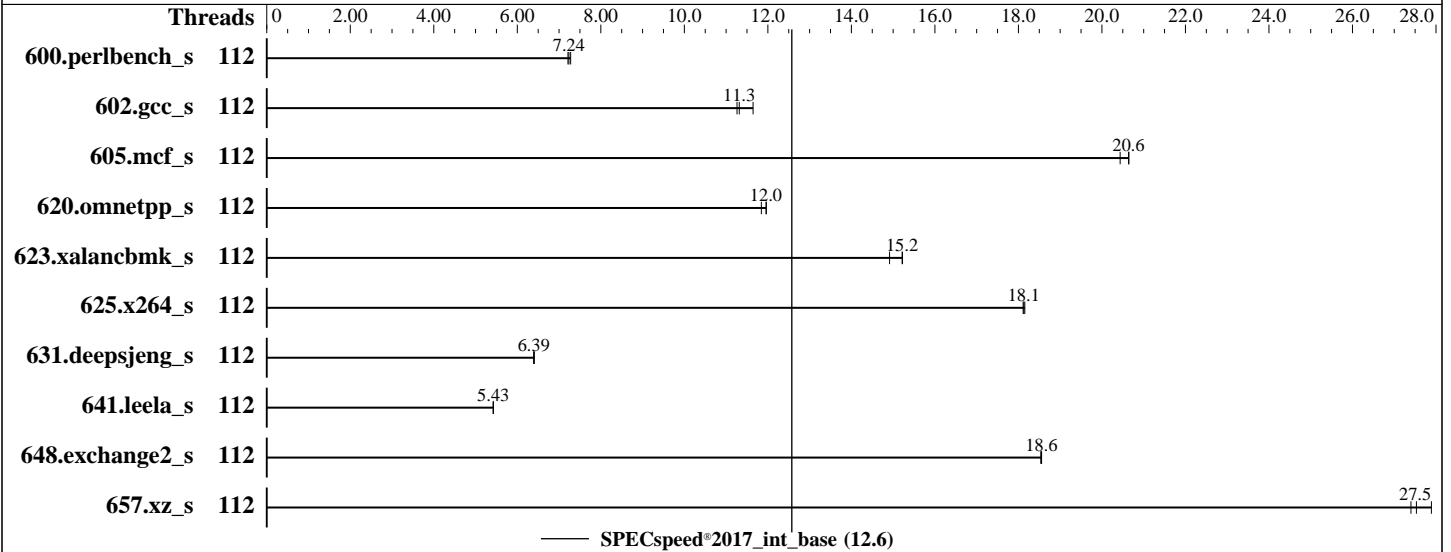
$SPECspeed^{®}2017\_int\_peak =$ Not Run

CPU2017 License: 9017	**Test Date:** Jun-2022
Test Sponsor: Lenovo Global Technology	**Hardware Availability:** Nov-2020
Tested by: Lenovo Global Technology	**Software Availability:** Nov-2021

Threads

Benchmark	Threads	Result
600.perlbench_s	112	7.24
602.gcc_s	112	11.3
605.mcf_s	112	20.6
620.omnetpp_s	112	12.0
623.xalancbmk_s	112	15.2
625.x264_s	112	18.1
631.deepsjeng_s	112	6.39
641.leela_s	112	5.43
648.exchange2_s	112	18.6
657.xz_s	112	27.5

SPECspeed®2017_int_base (12.6)

Hardware

CPU Name: Intel Xeon Platinum 8380H
 Max MHz: 4300
 Nominal: 2900
Enabled: 112 cores, 4 chips
Orderable: 2,4 chips
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 38.5 MB I+D on chip per chip
Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC4-3200AA-R)
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: Yes
Firmware: Lenovo BIOS Version M5E117I 1.51 released May-2022
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost
 of additional power usage

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SPECspeed®2017_int_peak = Not Run

CPU2017 License: 9017	**Test Date:** Jun-2022
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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	112	244	7.28	**245**	**7.24**	246	7.21							
602.gcc_s	112	**352**	**11.3**	342	11.6	354	11.3							
605.mcf_s	112	229	20.6	231	20.4	**229**	**20.6**							
620.omnetpp_s	112	138	11.8	**136**	**12.0**	136	12.0							
623.xalancbmk_s	112	95.0	14.9	**93.1**	**15.2**	93.1	15.2							
625.x264_s	112	97.2	18.2	**97.3**	**18.1**	97.4	18.1							
631.deepsjeng_s	112	224	6.39	224	6.41	**224**	**6.39**							
641.leela_s	112	**314**	**5.43**	314	5.43	314	5.42							
648.exchange2_s	112	**158**	**18.6**	159	18.5	158	18.6							
657.xz_s	112	222	27.9	**225**	**27.5**	226	27.4							

SPECspeed®2017_int_base =	12.6
SPECspeed®2017_int_peak =	Not Run

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"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH =
      "/home/cpu2017-1.1.8-ic2021.1-revB/lib/intel64:/home/cpu2017-1.1.8-ic202
      1.1-revB/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes

 Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
 memory using Redhat Enterprise Linux 8.0
 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
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.

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

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$SPECspeed®2017\_int\_base =$ 12.6

$SPECspeed®2017\_int\_peak =$ Not Run

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

Test Date: Jun-2022
Hardware Availability: Nov-2020
Software Availability: Nov-2021

General Notes (Continued)

```
 jemalloc, a general purpose malloc implementation
 built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
 sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
MONITOR/MWAIT set to Enabled
CPU P-state Control set to Cooperative with Legacy
Hyper-Threading set to Disabled
Adjacent Cache Prefetch set to Disabled
Workload Configuration set to I/O sensitive

 Sysinfo program /home/cpu2017-1.1.8-ic2021.1-revB/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on localhost.localdomain Sat Jun 23 06:26:09 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) Platinum 8380H CPU @ 2.90GHz
       4  "physical id"s (chips)
       112 "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  : 28
       physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
       physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
       physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
       physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30

 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):              112
       On-line CPU(s) list: 0-111
       Thread(s) per core:  1
```

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SPECspeed®2017_int_base =   12.6

SPECspeed®2017_int_peak = Not Run

Platform Notes (Continued)

```
        Core(s) per socket:   28
        Socket(s):            4
        NUMA node(s):         4
        Vendor ID:            GenuineIntel
        BIOS Vendor ID:       Intel(R) Corporation
        CPU family:           6
        Model:                85
        Model name:           Intel(R) Xeon(R) Platinum 8380H CPU @ 2.90GHz
        BIOS Model name:      Intel(R) Xeon(R) Platinum 8380H CPU @ 2.90GHz
        Stepping:             11
        CPU MHz:              2900.000
        CPU max MHz:          4300.0000
        CPU min MHz:          1000.0000
        BogoMIPS:             5800.00
        Virtualization:       VT-x
        L1d cache:            32K
        L1i cache:            32K
        L2 cache:             1024K
        L3 cache:             39424K
        NUMA node0 CPU(s):    0-27
        NUMA node1 CPU(s):    28-55
        NUMA node2 CPU(s):    56-83
        NUMA node3 CPU(s):    84-111
        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 monitor 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 cdp_l3
    invpcid_single intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
    flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms
    invpcid cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt
    avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
    cqm_mbm_total cqm_mbm_local avx512_bf16 dtherm ida arat pln pts hwp hwp_act_window
    hwp_epp hwp_pkg_req pku ospke avx512_vnni md_clear flush_l1d arch_capabilities


 /proc/cpuinfo cache data
    cache size : 39424 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 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
   node 0 size: 386655 MB
   node 0 free: 385253 MB
   node 1 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
   53 54 55
```

(Continued on next page)

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SPECspeed®2017_int_base =   12.6

SPECspeed®2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
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Test Date: Jun-2022
Hardware Availability: Nov-2020
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Platform Notes (Continued)

```
   node 1 size: 387065 MB
   node 1 free: 386602 MB
   node 2 cpus: 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
   81 82 83
   node 2 size: 387028 MB
   node 2 free: 386208 MB
   node 3 cpus: 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105
   106 107 108 109 110 111
   node 3 size: 387065 MB
   node 3 free: 386716 MB
   node distances:
   node   0   1   2   3
     0:  10  20  20  20
     1:  20  10  20  20
     2:  20  20  10  20
     3:  20  20  20  10

 From /proc/meminfo
    MemTotal:       1584962036 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="8.5 (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:
```

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Platform Notes (Continued)

```
 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 Jun 22 19:11

 SPEC is set to: /home/cpu2017-1.1.8-ic2021.1-revB
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda4      xfs   819G   37G  782G   5% /home

 From /sys/devices/virtual/dmi/id
     Vendor:          Lenovo
     Product:         ThinkSystem SR860 V2
     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:
      24x Samsung M393A8G40AB2-CWE 64 GB 2 rank 3200


 BIOS:
    BIOS Vendor:       Lenovo
    BIOS Version:      M5E117I-1.51
    BIOS Date:         05/02/2022
    BIOS Revision:     1.51
    Firmware Revision: 2.0


 (End of data from sysinfo program)
 System date/time for this result was not updated to right time
 and actual testing date can be referred to "spec.cpu2017.test_date"
```

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Compiler Version Notes

```
==============================================================================
C        | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base)
         | 625.x264_s(base) 657.xz_s(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++      | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
         | 641.leela_s(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 | 648.exchange2_s(base)
------------------------------------------------------------------------------
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

600.perlbench_s: `-DSPEC_LP64` `-DSPEC_LINUX_X64`
602.gcc_s: `-DSPEC_LP64`
605.mcf_s: `-DSPEC_LP64`
620.omnetpp_s: `-DSPEC_LP64`

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Base Portability Flags (Continued)

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`

Base Optimization Flags

C benchmarks:
```
-DSPEC_OPENMP -std=c11 -m64 -fiopenmp -Wl,-z,muldefs -xCORE-AVX512
-O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

C++ benchmarks:
```
-DSPEC_OPENMP -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
```

Fortran benchmarks:
```
-m64 -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.html
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-ICElake-J.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-ICElake-J.xml

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

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