SPEC CPU®2017 Integer Speed Result

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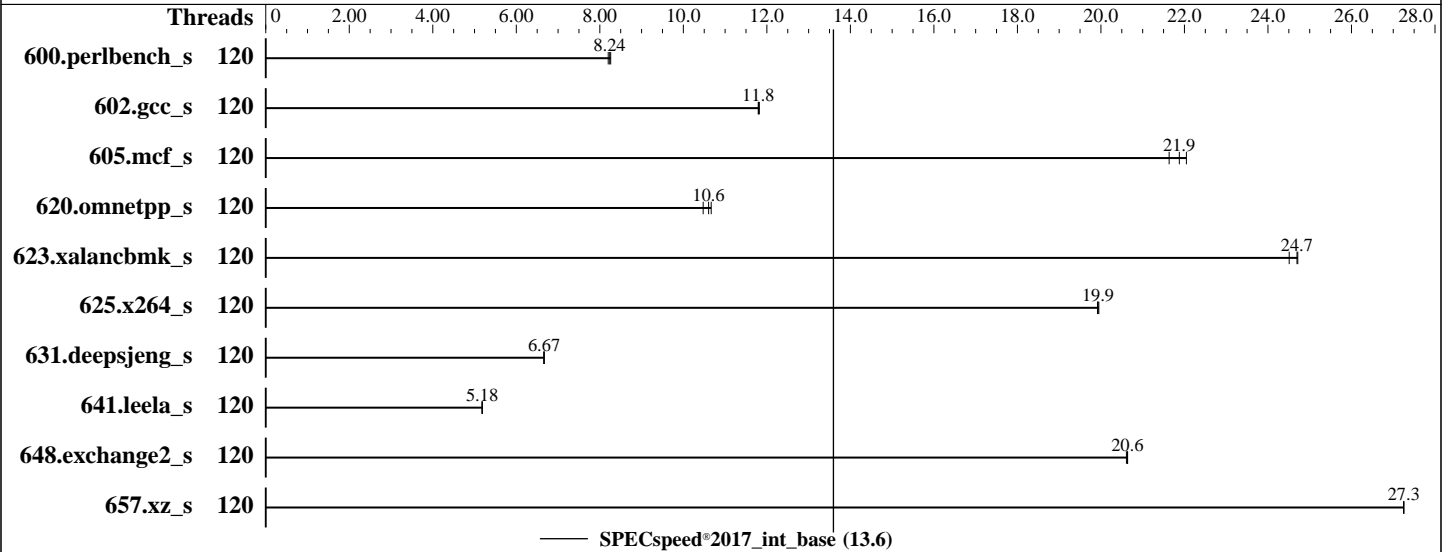## xFusion

FusionServer 2288H V7 (Intel Xeon Platinum 8490H)

$SPECspeed®2017\_int\_base = \quad 13.6$

$SPECspeed®2017_int_peak = $ Not Run

CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

Test Date: Dec-2022
Hardware Availability: Jan-2023
Software Availability: May-2022

Threads

Benchmark	Threads	Value
600.perlbench_s	120	8.24
602.gcc_s	120	11.8
605.mcf_s	120	21.9
620.omnetpp_s	120	10.6
623.xalancbmk_s	120	24.7
625.x264_s	120	19.9
631.deepsjeng_s	120	6.67
641.leela_s	120	5.18
648.exchange2_s	120	20.6
657.xz_s	120	27.3

SPECspeed®2017_int_base (13.6)

Hardware

CPU Name: Intel Xeon Platinum 8490H
 Max MHz: 3500
 Nominal: 1900
Enabled: 120 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 112.5 MB I+D on chip per chip
 Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x 1920 GB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux release 9.0 (Plow)
 5.14.0-70.13.1.el9_0.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: Yes
Firmware: Version 2.00.35 Released Nov-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: OS set to prefer performance at the cost of
 additional power usage

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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	120	**216**	**8.24**	215	8.26	216	8.20							
602.gcc_s	120	337	11.8	338	11.8	**338**	**11.8**							
605.mcf_s	120	218	21.6	214	22.0	**216**	**21.9**							
620.omnetpp_s	120	153	10.7	**154**	**10.6**	156	10.5							
623.xalancbmk_s	120	57.3	24.7	**57.4**	**24.7**	57.8	24.5							
625.x264_s	120	**88.5**	**19.9**	88.4	19.9	88.6	19.9							
631.deepsjeng_s	120	215	6.66	215	6.67	**215**	**6.67**							
641.leela_s	120	329	5.18	**329**	**5.18**	329	5.19							
648.exchange2_s	120	142	20.6	143	20.6	**142**	**20.6**							
657.xz_s	120	227	27.2	227	27.3	**227**	**27.3**							
SPECspeed®2017_int_base =	**13.6**													
SPECspeed®2017_int_peak =	**Not Run**													

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.
```

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/speccpu/lib/intel64:/home/speccpu/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"
```

General Notes

```
Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using Redhat Enterprise Linux 8.0
Transparent Huge Pages enabled by default
Prior to runcpu invocation
```

(Continued on next page)

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

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Hardware Availability: Jan-2023
Software Availability: May-2022

General Notes (Continued)

```
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.
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:
Performance Profile Set to Load Balance
Enable LP [Global] Set to Single LP

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on localhost.localdomain Mon Dec  5 00:59:41 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 8490H
      2  "physical id"s (chips)
      120 "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 : 60
      siblings  : 60
      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 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 56 57 58 59
      physical 1: 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 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 56 57 58 59

From lscpu from util-linux 2.37.4:
   Architecture:            x86_64
   CPU op-mode(s):          32-bit, 64-bit
   Address sizes:           46 bits physical, 57 bits virtual
   Byte Order:              Little Endian
   CPU(s):                  120
   On-line CPU(s) list:     0-119
   Vendor ID:               GenuineIntel
   BIOS Vendor ID:          Intel(R) Corporation
   Model name:              Intel(R) Xeon(R) Platinum 8490H
   BIOS Model name:         Intel(R) Xeon(R) Platinum 8490H
   CPU family:              6
   Model:                   143
   Thread(s) per core:      1
   Core(s) per socket:      60
   Socket(s):               2
   Stepping:                6
   Frequency boost:         enabled
```

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CPU2017 License: 6488

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Tested by: xFusion

Test Date: Dec-2022

Hardware Availability: Jan-2023

Software Availability: May-2022

Platform Notes (Continued)

```
        CPU max MHz:                        1901.0000
        CPU min MHz:                        800.0000
        BogoMIPS:                           3800.00
        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 tsc_known_freq 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 cat_l2 cdp_l3 invpcid_single intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp
        ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad 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 avx_vnni
        avx512_bf16 wbnoinvd dtherm ida arat pln pts avx512vbmi umip pku ospke waitpkg
        avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq
        la57 rdpid bus_lock_detect cldemote movdiri movdir64b enqcmd fsrm md_clear serialize
        tsxldtrk pconfig arch_lbr avx512_fp16 amx_tile flush_l1d arch_capabilities
        Virtualization:                     VT-x
        L1d cache:                          5.6 MiB (120 instances)
        L1i cache:                          3.8 MiB (120 instances)
        L2 cache:                           240 MiB (120 instances)
        L3 cache:                           225 MiB (2 instances)
        NUMA node(s):                       2
        NUMA node0 CPU(s):                  0-59
        NUMA node1 CPU(s):                  60-119
        Vulnerability Itlb multihit:        Not affected
        Vulnerability L1tf:                 Not affected
        Vulnerability Mds:                  Not affected
        Vulnerability Meltdown:             Not affected
        Vulnerability Spec store bypass:    Mitigation; Speculative Store Bypass disabled via
        prctl
        Vulnerability Spectre v1:           Mitigation; usercopy/swapgs barriers and __user
        pointer sanitization
        Vulnerability Spectre v2:           Mitigation; Enhanced IBRS, IBPB conditional, RSB
        filling
        Vulnerability Srbds:                Not affected
        Vulnerability Tsx async abort:      Not affected

    From lscpu --cache:
        NAME ONE-SIZE ALL-SIZE WAYS TYPE          LEVEL    SETS PHY-LINE COHERENCY-SIZE
        L1d       48K     5.6M   12 Data              1      64        1             64
        L1i       32K     3.8M    8 Instruction       1      64        1             64
        L2         2M     240M   16 Unified           2    2048        1             64
        L3     112.5M     225M   15 Unified           3  122880        1             64

    /proc/cpuinfo cache data
       cache size : 115200 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 14 15 16 17 18 19 20 21 22 23 24 25 26 27
      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 56
      57 58 59
      node 0 size: 257060 MB
      node 0 free: 255083 MB
      node 1 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 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
      110 111 112 113 114 115 116 117 118 119
```

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CPU2017 License: 6488
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Platform Notes (Continued)

```
  node 1 size: 258024 MB
  node 1 free: 257611 MB
  node distances:
  node   0   1
    0:  10  21
    1:  21  10

From /proc/meminfo
   MemTotal:       527447148 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

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

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux"
      VERSION="9.0 (Plow)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="9.0"
      PLATFORM_ID="platform:el9"
      PRETTY_NAME="Red Hat Enterprise Linux 9.0 (Plow)"
      ANSI_COLOR="0;31"
   redhat-release: Red Hat Enterprise Linux release 9.0 (Plow)
   system-release: Red Hat Enterprise Linux release 9.0 (Plow)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:9::baseos

uname -a:
   Linux localhost.localdomain 5.14.0-70.13.1.el9_0.x86_64 #1 SMP PREEMPT Thu Apr 14
   12:42:38 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
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 Dec 4 21:24

SPEC is set to: /home/speccpu
   Filesystem            Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   372G  7.9G  364G   3% /home

From /sys/devices/virtual/dmi/id
    Product:         2288H V7
    Product Family: Eagle Stream

 Additional information from dmidecode 3.3 follows.  WARNING: Use caution when you
```

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Platform Notes (Continued)

```
 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:
     16x Samsung M321R4GA3BB6-CQKDG 32 GB 2 rank 4800

 BIOS:
    BIOS Vendor:
    BIOS Version:        2.00.35
    BIOS Date:           11/30/2022
    BIOS Revision:       0.35

 (End of data from sysinfo program)
```

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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------


==============================================================================================
Fortran | 648.exchange2_s(base)
----------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
 icx

C++ benchmarks:
 icpx

Fortran benchmarks:
 ifx

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

C++ benchmarks:
-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:
-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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/xFusion-Platform-Settings-SPR-V1.0-revB.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/xFusion-Platform-Settings-SPR-V1.0-revB.xml

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

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