SPEC CPU®2017 Integer Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6242R, 3.10 GHz)

$SPECspeed^{®}2017\_int\_base = 11.7$

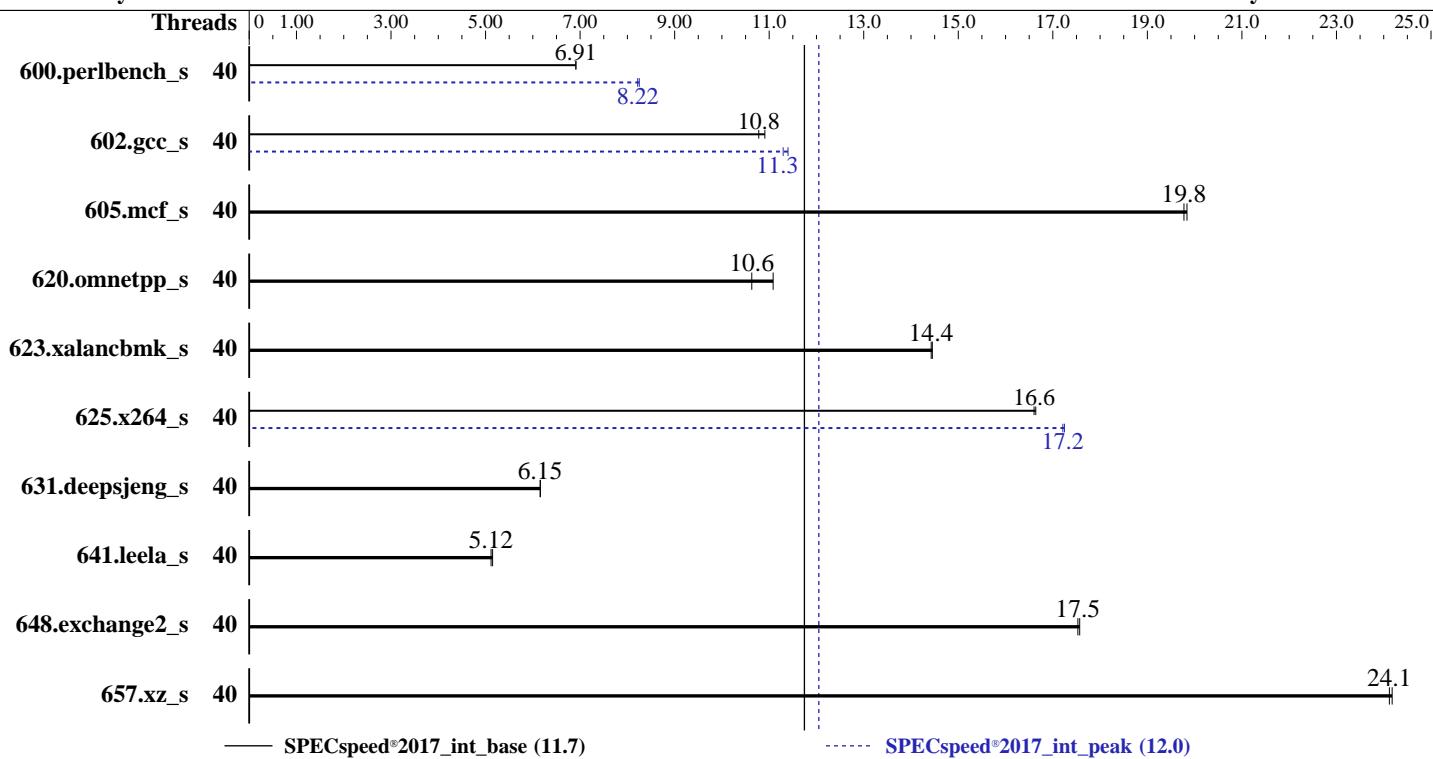$SPECspeed^{®}2017\_int\_peak = 12.0$

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

Test Date: Nov-2021
Hardware Availability: Apr-2019
Software Availability: Dec-2020

Threads	0 1.00 3.00 5.00 7.00 9.00 11.0 13.0 15.0 17.0 19.0 21.0 23.0 25.0
600.perlbench_s 40	6.91 / 8.22
602.gcc_s 40	10.8 / 11.3
605.mcf_s 40	19.8
620.omnetpp_s 40	10.6
623.xalancbmk_s 40	14.4
625.x264_s 40	16.6 / 17.2
631.deepsjeng_s 40	6.15
641.leela_s 40	5.12
648.exchange2_s 40	17.5
657.xz_s 40	24.1

SPECspeed®2017_int_base (11.7)   SPECspeed®2017_int_peak (12.0)

Hardware

CPU Name: Intel Xeon Gold 6242R
 Max MHz: 4100
 Nominal: 3100
Enabled: 40 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 35.75 MB I+D on chip per chip
 Other: None
Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)
Storage: 1 x 1.6 TB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux 8.3 (Ootpa)
 4.18.0-240.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;
 C/C++: Version 2021.1 of Intel C/C++ Compiler
 Classic Build 20201112 for Linux
Parallel: Yes
Firmware: Version 2.13.1 released Nov-2021
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance
 at the cost of additional power usage.

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6242R, 3.10 GHz)

$SPECspeed®2017\_int\_base = 11.7$

$SPECspeed®2017\_int\_peak = 12.0$

CPU2017 License: 55	**Test Date:** Nov-2021
Test Sponsor: Dell Inc.	**Hardware Availability:** Apr-2019
Tested by: Dell Inc.	**Software Availability:** Dec-2020

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	40	**257**	**6.91**	257	6.91			40	**216**	**8.22**	215	8.25		
602.gcc_s	40	365	10.9	**369**	**10.8**			40	**353**	**11.3**	349	11.4		
605.mcf_s	40	**239**	**19.8**	238	19.8			40	**239**	**19.8**	238	19.8		
620.omnetpp_s	40	**153**	**10.6**	147	11.1			40	**153**	**10.6**	147	11.1		
623.xalancbmk_s	40	**98.2**	**14.4**	98.1	14.5			40	**98.2**	**14.4**	98.1	14.5		
625.x264_s	40	106	16.6	**106**	**16.6**			40	102	17.2	**102**	**17.2**		
631.deepsjeng_s	40	**233**	**6.15**	233	6.16			40	**233**	**6.15**	233	6.16		
641.leela_s	40	331	5.15	**333**	**5.12**			40	331	5.15	**333**	**5.12**		
648.exchange2_s	40	167	17.6	**168**	**17.5**			40	167	17.6	**168**	**17.5**		
657.xz_s	40	**256**	**24.1**	256	24.2			40	**256**	**24.1**	256	24.2		
SPECspeed®2017_int_base =		**11.7**												
SPECspeed®2017_int_peak =		**12.0**												

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/lib/intel64:/home/cpu2017-1.1.8-ic2021.1/j
     e5.0.1-64"
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
 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

 NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
 is mitigated in the system as tested and documented.
```

(Continued on next page)

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6242R, 3.10 GHz)

SPECspeed®2017_int_base = 11.7

SPECspeed®2017_int_peak = 12.0

CPU2017 License: 55		**Test Date:**	Nov-2021
Test Sponsor: Dell Inc.		**Hardware Availability:**	Apr-2019
Tested by: Dell Inc.		**Software Availability:**	Dec-2020

General Notes (Continued)

```
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 settings:
              Logical Processor : Disabled
     Virtualization Technology : Disabled

                System Profile : Custom
         CPU Power Management : Maximum Performance
                          C1E : Disabled
                     C States : Autonomous
           Memory Patrol Scrub : Disabled
     Energy Efficiency Policy : Performance
    CPU Interconnect Bus Link
              Power Management : Disabled
           PCI ASPM L1 Link
              Power Management : Disabled


Sysinfo program /home/cpu2017-1.1.8-ic2021.1/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on localhost.localdomain Sat Nov  6 12:20:12 2021

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 6242R CPU @ 3.10GHz
      2  "physical id"s (chips)
      40 "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 : 20
      siblings  : 20
      physical 0: cores 0 1 2 4 5 6 8 9 10 11 12 13 16 17 18 19 21 26 28 29
      physical 1: cores 0 1 3 5 6 8 10 12 13 16 17 18 19 20 21 25 26 27 28 29

From lscpu from util-linux 2.32.1:
      Architecture:        x86_64
      CPU op-mode(s):      32-bit, 64-bit
      Byte Order:          Little Endian
```

(Continued on next page)

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6242R, 3.10 GHz)

SPECspeed®2017_int_base = 11.7

SPECspeed®2017_int_peak = 12.0

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

Test Date: Nov-2021
Hardware Availability: Apr-2019
Software Availability: Dec-2020

Platform Notes (Continued)

```
        CPU(s):              40
        On-line CPU(s) list: 0-39
        Thread(s) per core:  1
        Core(s) per socket:  20
        Socket(s):           2
        NUMA node(s):        2
        Vendor ID:           GenuineIntel
        CPU family:          6
        Model:               85
        Model name:          Intel(R) Xeon(R) Gold 6242R CPU @ 3.10GHz
        Stepping:            7
        CPU MHz:             3591.952
        CPU max MHz:         4100.0000
        CPU min MHz:         1200.0000
        BogoMIPS:            6200.00
        Virtualization:      VT-x
        L1d cache:           32K
        L1i cache:           32K
        L2 cache:            1024K
        L3 cache:            36608K
        NUMA node0 CPU(s):   0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38
        NUMA node1 CPU(s):   1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39
        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 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 dtherm ida arat pln pts pku ospke
    avx512_vnni md_clear flush_l1d arch_capabilities

 /proc/cpuinfo cache data
    cache size : 36608 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 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38
   node 0 size: 184332 MB
   node 0 free: 185620 MB
   node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39
   node 1 size: 184018 MB
   node 1 free: 189602 MB
   node distances:
```

(Continued on next page)

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

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6242R, 3.10 GHz)

$SPECspeed®2017\_int\_base = 11.7$

$SPECspeed®2017\_int\_peak = 12.0$

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

Test Date: Nov-2021
Hardware Availability: Apr-2019
Software Availability: Dec-2020

Platform Notes (Continued)

```
    node   0   1
      0:  10  21
      1:  21  10

 From /proc/meminfo
    MemTotal:       394819212 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="8.3 (Ootpa)"
       ID="rhel"
       ID_LIKE="fedora"
       VERSION_ID="8.3"
       PLATFORM_ID="platform:el8"
       PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
       ANSI_COLOR="0;31"
    redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
    system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

 uname -a:
    Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
    x86_64 x86_64 x86_64 GNU/Linux

 Kernel self-reported vulnerability status:

 CVE-2018-12207 (iTLB Multihit):            KVM: Mitigation: Split huge pages
 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
```

(Continued on next page)

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6242R, 3.10 GHz)

SPECspeed®2017_int_base = 11.7

SPECspeed®2017_int_peak = 12.0

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

Test Date: Nov-2021
Hardware Availability: Apr-2019
Software Availability: Dec-2020

Platform Notes (Continued)

```
 CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
 CVE-2019-11135 (TSX Asynchronous Abort):                Mitigation: TSX disabled

 run-level 3 Nov 6 12:16

 SPEC is set to: /home/cpu2017-1.1.8-ic2021.1
    Filesystem              Type  Size  Used Avail Use% Mounted on
    /dev/mapper/rhel-home xfs   390G  9.3G  381G   3% /home

 From /sys/devices/virtual/dmi/id
    Vendor:          Dell Inc.
    Product:         PowerEdge C6420
    Product Family: PowerEdge

 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:
      7x 00AD00B300AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933
      2x 00AD063200AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933
      3x 00AD069D00AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933
      4x Not Specified Not Specified

 BIOS:
    BIOS Vendor:       Dell Inc.
    BIOS Version:      2.13.1
    BIOS Date:         11/03/2021
    BIOS Revision:     2.13

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C        | 600.perlbench_s(peak)
------------------------------------------------------------------------------
Intel(R) C 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.
------------------------------------------------------------------------------


==============================================================================
C        | 600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)
         | 625.x264_s(base, peak) 657.xz_s(base, peak)
------------------------------------------------------------------------------
```

(Continued on next page)

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6242R, 3.10 GHz)

SPECspeed®2017_int_base = 11.7

SPECspeed®2017_int_peak = 12.0

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

Test Date: Nov-2021
Hardware Availability: Apr-2019
Software Availability: Dec-2020

Compiler Version Notes (Continued)

```
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        | 600.perlbench_s(peak)
------------------------------------------------------------------------------
Intel(R) C 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.
------------------------------------------------------------------------------


==============================================================================
C        | 600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)
         | 625.x264_s(base, peak) 657.xz_s(base, peak)
------------------------------------------------------------------------------
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, peak) 623.xalancbmk_s(base, peak)
         | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
------------------------------------------------------------------------------
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, peak)
------------------------------------------------------------------------------
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

(Continued on next page)

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6242R, 3.10 GHz)

SPECspeed®2017_int_base = 11.7

SPECspeed®2017_int_peak = 12.0

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

Test Date: Nov-2021
Hardware Availability: Apr-2019
Software Availability: Dec-2020

Base Compiler Invocation (Continued)

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`
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
```

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6242R, 3.10 GHz)

SPECspeed®2017_int_base = 11.7

SPECspeed®2017_int_peak = 12.0

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

Test Date: Nov-2021
Hardware Availability: Apr-2019
Software Availability: Dec-2020

Peak Compiler Invocation

C benchmarks (except as noted below):
```
icx
```

```
600.perlbench_s: icc
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifort
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

```
600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-strict-overflow
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

```
602.gcc_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

```
605.mcf_s: basepeak = yes
```

```
625.x264_s: -DSPEC_OPENMP -fiopenmp -std=c11 -m64 -Wl,-z,muldefs
-xCORE-AVX512 -flto -O3 -ffast-math
-qopt-mem-layout-trans=4 -fno-alias
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

```
657.xz_s: basepeak = yes
```

(Continued on next page)

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6242R, 3.10 GHz)

SPECspeed®2017_int_base = 11.7

SPECspeed®2017_int_peak = 12.0

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

Test Date: Nov-2021
Hardware Availability: Apr-2019
Software Availability: Dec-2020

Peak Optimization Flags (Continued)

C++ benchmarks:

620.omnetpp_s: `basepeak = yes`

623.xalancbmk_s: `basepeak = yes`

631.deepsjeng_s: `basepeak = yes`

641.leela_s: `basepeak = yes`

Fortran benchmarks:

648.exchange2_s: `basepeak = yes`

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/Dell-Platform-Flags-PowerEdge-Intel-ICX-rev1.4.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/Dell-Platform-Flags-PowerEdge-Intel-ICX-rev1.4.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 2021-11-06 13:20:11-0400.
Report generated on 2021-12-07 17:00:59 by CPU2017 PDF formatter v6442.
Originally published on 2021-12-07.