## SPEC CPU®2017 Integer Speed Result

### Dell Inc.

**PowerEdge R760 (Intel Xeon Platinum 8468)**

<table>
<thead>
<tr>
<th>SPECspeed 2017 Int Base</th>
<th>SPECspeed 2017 Int Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>= 12.1</td>
<td>= 12.4</td>
</tr>
</tbody>
</table>

**Test Date:** Dec-2022  
**Hardware Availability:** Feb-2023

**CPU2017 License:** 6573  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.

**Threads**

<table>
<thead>
<tr>
<th>Spec Benchmark</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>96</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>96</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>96</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>96</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>96</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>96</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>96</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>96</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>96</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>96</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Platinum 8468  
- **Max MHz:** 3800  
- **Nominal:** 2100  
- **Enabled:** 96 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:** 105 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R)  
- **Storage:** 125 GB on tmpfs  
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 15 SP4  
  5.14.21-150400.22-default  
- **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 0.3.2 released Nov-2022  
- **File System:** tmpfs  
- **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.
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Baseline Threads</th>
<th>Baseline Seconds</th>
<th>Baseline Ratio</th>
<th>Peak Threads</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
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<td>96</td>
<td>236</td>
<td>7.53</td>
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<td>10.1</td>
<td>96</td>
<td>377</td>
<td>10.6</td>
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<td>605.mcf_s</td>
<td>96</td>
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<td>18.8</td>
<td>96</td>
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<td>18.8</td>
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<td>620.omnetpp_s</td>
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<td>10.5</td>
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<td>623.xalancbmk_s</td>
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<td>62.3</td>
<td>22.7</td>
<td>96</td>
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<td>96</td>
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<td>4.61</td>
<td>96</td>
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<td>4.61</td>
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<td>648.exchange2_s</td>
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<td>18.2</td>
<td>96</td>
<td>162</td>
<td>18.2</td>
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<tr>
<td>657.xz_s</td>
<td>96</td>
<td>262</td>
<td>23.6</td>
<td>96</td>
<td>262</td>
<td>23.6</td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 12.1
SPECspeed®2017_int_peak = 12.4

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 = "/mnt/ramdisk/cpu2017-1.1.8-ic2022.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.8-ic2022.1/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

(Continued on next page)
**General Notes (Continued)**

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

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 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G tmpfs /mnt/ramdisk"

**Platform Notes**

BIOS settings:
- ADDDC Setting : Disabled
- DIMM Self Healing on
- Uncorrectable Memory Error : Disabled
- Virtualization Technology : Disabled
- Logical Processor : 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
- CIE : 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 982a61ec0915b55891ef0e16aca64d
running on localhost Tue Dec 13 08:38:40 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 8468
2 "physical id"s (chips)
96 "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 : 48
siblings : 48
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
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
(Continued on next page)```
Dell Inc.

PowerEdge R760 (Intel Xeon Platinum 8468)

SPEC CPU®2017 Integer Speed Result

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TEST SPONSOR: Dell Inc.

TESTED BY: Dell Inc.

CPU2017 License: 6573
Test Date: Dec-2022
Test Sponsor: Dell Inc.
Software Availability: Jun-2022
Tested by: Dell Inc.
Hardware Availability: Feb-2023

SPECspeed®2017_int_base = 12.1
SPECspeed®2017_int_peak = 12.4

Platform Notes (Continued)

From lscpu from util-linux 2.37.2:

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):                96
On-line CPU(s) list:   0-95
Vendor ID:             GenuineIntel
Model name:            Intel(R) Xeon(R) Platinum 8468
CPU family:            6
Model:                 143
Thread(s) per core:    1
Core(s) per socket:    48
Socket(s):             2
Stepping:              8
BogoMIPS:              4200.00

From lscpu --cache:

NAME ONE-SIZE ALL-SIZE WAYS TYPE  LEVEL  SETS  PHY-LINE  COHERENCY-SIZE
L1d  48K  4.5M  12 Data      1  64   1  64
L1i  32K   3M   8 Instruction 1  64   1  64
L2   2M  192M  16 Unified   2 2048  1  64

(Continued on next page)
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SPECspeed®2017_int_base = 12.1
SPECspeed®2017_int_peak = 12.4

Platform Notes (Continued)

L3 105M 210M 15 Unified 3 114688 1 64

/proccpuinfo cache data
    cache size : 107920 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
    node 0 size: 128470 MB
    node 0 free: 127441 MB
    node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
    node 1 size: 129017 MB
    node 1 free: 121203 MB
    node 2 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
    node 2 size: 129017 MB
    node 2 free: 128865 MB
    node 3 cpus: 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
    node 3 size: 128954 MB
    node 3 free: 128800 MB
    node distances:
        node   0   1   2   3
        0:  10  12  21  21
        1:  12  10  21  21
        2:  21  21  10  12
        3:  21  21  12  10

From /proc/meminfo
    MemTotal:      527831732 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
    os-release:
        NAME="SLES"
        VERSION="15-SP4"
        VERSION_ID="15.4"
        PRETTY_NAME="SUSE Linux Enterprise Server 15 SP4"
        ID="sles"
        ID_LIKE="suse"
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:15:sp4"

uname -a:
    Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18
    UTC 2022 (49db222) 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):
    Mitigation: Speculative Store
    Bypass disabled via prctl and
    seccomp
CVE-2018-3639 (Speculative Store Bypass):
    Mitigation: speculative store
    barriers and __user pointer
    sanitization
CVE-2017-5753 (Spectre variant 1):
    Mitigation: Enhanced IBRS, IBPB:

(Continued on next page)
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Software Availability: Jun-2022

Platform Notes (Continued)
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 13 08:22
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-ic2022.1
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 125G 3.6G 122G 3% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
Vendor: Dell Inc.
Product: PowerEdge R760
Product Family: PowerEdge
Serial: SLR7601

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:
16x 00AD063200AD HMCG88MEBA107N 32 GB 2 rank 4800

BIOS:
BIOS Vendor: Dell Inc.
BIOS Version: 0.3.2
BIOS Date: 11/30/2022
BIOS Revision: 0.3

(End of data from sysinfo program)

Compiler Version Notes

C
| 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak)

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, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak)
641.leela_s(base, peak)

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Fortran
| 648.exchange2_s(base, peak)

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Dell Inc. PowerEdge R760 (Intel Xeon Platinum 8468)

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| Tested by: | Dell Inc. |
| Test Date: | Dec-2022 |
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| Software Availability: | Jun-2022 |

**Base Compiler Invocation**

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

**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 -DSPEC_LINUX
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
SPEC CPU®2017 Integer Speed Result

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PoweEdge R760 (Intel Xeon Platinum 8468)

**SPECspeed®2017_int_base = 12.1**

**SPECspeed®2017_int_peak = 12.4**

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<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tr>
<td>Test Sponsor</td>
<td>Dell Inc.</td>
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<tr>
<td>Tested by</td>
<td>Dell Inc.</td>
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<tr>
<td>Tested by</td>
<td>Dell Inc.</td>
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</table>

**Peak Compiler Invocation**

**C benchmarks:**  
icx

**C++ benchmarks:**  
icpx

**Fortran benchmarks:**  
ifx

**Peak Portability Flags**

*Same as Base Portability Flags*

**Peak Optimization Flags**

**C benchmarks:**

600.perlbench_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -O3
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-fno-strict-overflow -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 -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

605.mcfs_s: basepeak = yes

625.x264_s: -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-fno-alias -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

657.xz_s: basepeak = yes

**C++ benchmarks:**

(Continued on next page)
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Software Availability: Jun-2022

Peak Optimization Flags (Continued)

620.omnetpp_s: basepeak = yes
623.xalancbk_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/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/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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