## SPEC CPU®2017 Integer Speed Result

**Dell Inc.**  
PowerEdge FC640 (Intel Xeon Silver 4214R, 2.40 GHz)  

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.66</td>
<td>9.90</td>
</tr>
</tbody>
</table>

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

**Threads**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Exit Value</th>
<th>Exit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_s</td>
<td>24</td>
<td>5.82</td>
</tr>
<tr>
<td>gcc_s</td>
<td>24</td>
<td>6.94</td>
</tr>
<tr>
<td>mcf_s</td>
<td>24</td>
<td>9.19</td>
</tr>
<tr>
<td>omnetpp_s</td>
<td>24</td>
<td>9.63</td>
</tr>
<tr>
<td>xalancbmk_s</td>
<td>24</td>
<td>6.70</td>
</tr>
<tr>
<td>x264_s</td>
<td>24</td>
<td>17.4</td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td>24</td>
<td>12.2</td>
</tr>
<tr>
<td>leela_s</td>
<td>24</td>
<td>13.7</td>
</tr>
<tr>
<td>exchange2_s</td>
<td>24</td>
<td>5.27</td>
</tr>
<tr>
<td>xz_s</td>
<td>24</td>
<td>4.29</td>
</tr>
</tbody>
</table>

**Software**

- **OS:** Red Hat Enterprise Linux 8.4 (Ootpa) 4.18.0-305.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 2.12.2 released Jul-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.

**Hardware**

- **CPU Name:** Intel Xeon Silver 4214R  
- **Max MHz:** 3500  
- **Nominal:** 2400  
- **Enabled:** 24 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:** 16.5 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R, running at 2400)  
- **Storage:** 1 x 1.6 TB SATA SSD  
- **Other:** None  

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Standard Performance Evaluation Corporation (info@spec.org)  
https://www.spec.org/
SPEC CPU®2017 Integer Speed Result
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CPU2017 License: 55
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SPECspeed®2017_int_base = 9.66
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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<tr>
<td>600.perlbench_s</td>
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<td>5.83</td>
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<td>272</td>
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<td>623.xalancbmk_s</td>
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<td>12.2</td>
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<td>12.3</td>
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<td>116</td>
<td>12.2</td>
<td>115</td>
<td>12.3</td>
<td></td>
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<tr>
<td>625.x264_s</td>
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<td>13.7</td>
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<td>13.7</td>
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<td>124</td>
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<td>5.27</td>
<td>272</td>
<td>5.27</td>
<td>24</td>
<td>272</td>
<td>5.27</td>
<td>272</td>
<td>5.27</td>
<td></td>
</tr>
<tr>
<td>641.leela_s</td>
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<td>397</td>
<td>4.29</td>
<td>398</td>
<td>4.29</td>
<td>24</td>
<td>397</td>
<td>4.29</td>
<td>398</td>
<td>4.29</td>
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<tr>
<td>648.exchange2_s</td>
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<td>192</td>
<td>15.3</td>
<td>193</td>
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<td>657.xz_s</td>
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<td>315</td>
<td>19.6</td>
<td>312</td>
<td>19.8</td>
<td></td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 9.66
SPECspeed®2017_int_peak = 9.90

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 = "/root/cpu2017-1.1.8-ic2021.1/lib/intel64:/root/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

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)
**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 /root/cpu2017-1.1.8-ic2021.1/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e6acaf64d
running on localhost.localdomain Wed Dec  1 05:17:05 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) Silver 4214R CPU @ 2.40GHz
  - 2 "physical id"s (chips)
  - 24 "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: 12
- siblings: 12
- physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
- physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13

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)
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Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Hardware Availability: Apr-2019
Software Availability: May-2021

Test Date: Dec-2021

Platform Notes (Continued)

CPU(s): 24
On-line CPU(s) list: 0-23
Thread(s) per core: 1
Core(s) per socket: 12
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4214R CPU @ 2.40GHz
BIOS Model name: Intel(R) Xeon(R) Silver 4214R CPU @ 2.40GHz
Stepping: 7
CPU MHz: 3000.162
CPU max MHz: 3500.0000
CPU min MHz: 1000.0000
BogoMIPS: 4800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 16896K
NUMA node0 CPU(s): 0,2,4,6,8,10,12,14,16,18,20,22
NUMA node1 CPU(s): 1,3,5,7,9,11,13,15,17,19,21,23
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 abmov cdscntcl pdcm ctssmpcss clflushopt clwb intel_pt x邝xpm xsaveopt xsaves cmqm_llc cmqm_occup_llc cmqm_mbb_total cmqm_mbb_local dtherm ida arat pln pts pku ospke

/cacheinfo cache data
cache size : 16896 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
node 0 size: 192037 MB
node 0 free: 183019 MB
node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23
node 1 size: 193532 MB

(Continued on next page)
### Platform Notes (Continued)

node 1 free: 193213 MB  
node distances:  
node 0 1  
0: 10 21  
1: 21 10  

From /proc/meminfo  
MemTotal: 394824212 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="8.4 (Ootpa)"  
ID="rhel"  
ID_LIKE="fedora"  
VERSION_ID="8.4"  
PLATFORM_ID="platform:el8"  
PRETTY_NAME="Red Hat Enterprise Linux 8.4 (Ootpa)"  
ANSI_COLOR="0;31"  
redhat-release: Red Hat Enterprise Linux release 8.4 (Ootpa)  
system-release: Red Hat Enterprise Linux release 8.4 (Ootpa)  
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.4:ga  
uname –a:  
Linux localhost.localdomain 4.18.0-305.el8.x86_64 #1 SMP Thu Apr 29 08:54:30 EDT 2021  
x86_64 x86_64 x86_64 GNU/Linux  

Kernel self-reported vulnerability status:  
CVE-2018-12207 (iTLB Multihit):  
CVE-2018-3620 (L1 Terminal Fault):  
Microarchitectural Data Sampling:  
CVE-2017-5754 (Meltdown):  
CVE-2018-3639 (Speculative Store Bypass):  
CVE-2017-5753 (Spectre variant 1):  

KVM: Mitigation: Split huge pages Not affected  
Not affected  
Not affected  
Mitigation: Speculative Store Bypass disabled via prctl and seccomp  
Mitigation: userscopy/swapgs barriers and __user pointer sanitation  

(Continued on next page)
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</table>

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

**Platform Notes (Continued)**

CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling  
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected  

run-level 3 Dec 1 05:14  
SPEC is set to: /root/cpu2017-1.1.8-ic2021.1  
Filesystem | Type | Size | Used | Avail | Use% | Mounted on |
--- | --- | --- | --- | --- | --- | --- |
/dev/sda2 | xfs | 931G | 32G | 900G | 4% | / |

From /sys/devices/virtual/dmi/id  
Vendor: Dell Inc.  
Product: PowerEdge FC640  
Product Family: PowerEdge  
Serial: 1234567  

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:  
3x 00AD00B300AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2400  
6x 00AD063200AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2400  
3x 00AD069D00AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2400  

BIOS:  
BIOS Vendor: Dell Inc.  
BIOS Version: 2.12.2  
BIOS Date: 07/12/2021  
BIOS Revision: 2.12  

(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)
```

(Continued on next page)
### Compiler Version Notes (Continued)

<table>
<thead>
<tr>
<th>625.x264_s(base, peak)</th>
<th>657.xz_s(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113</td>
<td></td>
</tr>
<tr>
<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
<td></td>
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<tr>
<td>600.perlbench_s(base)</td>
<td>602.gcc_s(base, peak)</td>
</tr>
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<td>641.leela_s(base, peak)</td>
</tr>
<tr>
<td>648.exchange2_s(base, peak)</td>
<td></td>
</tr>
<tr>
<td>Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000</td>
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</tr>
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### Base Compiler Invocation

C benchmarks:

`icx`
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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
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 -fopenmp -Wl,-z,muldefs -xCORE-AVX2
   -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-AVX2 -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-AVX2 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
   -nostandard-realloc-lhs -align array32byte -auto
   -mbranches-within-32B-boundaries
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Software Availability: May-2021

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: -W1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX2 -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 -W1,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX2 -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 -fopenmp -std=c11 -m64 -W1,-z,muldefs
-xCORE-AVX2 -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)
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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

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-rev1.5.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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