Dell Inc.

PowerEdge XR4520c (Intel Xeon D-2712T, 1.90 GHz)

SPECrater®2017_int_base = 28.0
SPECrater®2017_int_peak = 28.6

Dell Inc.

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

Test Date: Aug-2022
Hardware Availability: Dec-2022
Software Availability: Jul-2022

Copies | 0 | 3.0 | 6.0 | 9.0 | 12.0 | 15.0 | 18.0 | 21.0 | 24.0 | 27.0 | 30.0 | 33.0 | 36.0 | 39.0 | 42.0 | 45.0 | 48.0 | 51.0 | 54.0
500.perlbench_r 8 | | | | | | | | | | | | | | | | | | | | 20.2 |
502.gcc_r 8 | | | | | | | | | | | | | | | | | | | | 25.4 |
505.mcf_r 8 | | | | | | | | | | | | | | | | | | | | 27.1 |
520.omnetpp_r 8 | | | | | | | | | | | | | | | | | | | | 21.8 |
523.xalancbmk_r 8 | | | | | | | | | | | | | | | | | | | | 47.7 |
525.x264_r 8 | | | | | | | | | | | | | | | | | | | | 49.6 |
531.deepsjeng_r 8 | | | | | | | | | | | | | | | | | | | | 51.9 |
541.leela_r 8 | | | | | | | | | | | | | | | | | | | | 53.6 |
548.exchange2_r 8 | | | | | | | | | | | | | | | | | | | | 53.6 |
557.xz_r 8 | | | | | | | | | | | | | | | | | | | | 50.0 |

SPECrater®2017_int_base (28.0)
SPECrater®2017_int_peak (28.6)

Hardware
CPU Name: Intel Xeon D-2712T
Max MHz: 3000
Nominal: 1900
Enabled: 4 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 1.25 MB I+D on chip per core
L3: 15 MB I+D on chip per chip
Other: None
Memory: 128 GB (4 x 32 GB 2Rx8 PC4-3200AA-R, running at 2666)
Storage: 125 GB on tmpfs
Other: None

Software
OS: Red Hat Enterprise Linux 8.6 (Ootpa)
4.18.0-372.19.1.el8_6.x86_64
Compiler: C/C++: Version 2022.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2021.5 of Intel Fortran Compiler
Classic for Linux;
C/C++: Version 2021.5 of Intel C/C++ Compiler Classic for Linux
Parallel: No
Firmware: Version 0.5.6 released Aug-2022
File System: tmpfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-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>Copies</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>8</td>
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<tr>
<td>557.xz_r</td>
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<td>15.3</td>
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<td>15.3</td>
<td>8</td>
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</tr>
</tbody>
</table>

SPECrater®2017_int_base = 28.0
SPECrater®2017_int_peak = 28.6

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.xalanchmk_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.

Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset commands to bind each copy to a specific processor.
For details, please see the config file.

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:
MALLOC_CONF = "retain:true"
SPEC CPU®2017 Integer Rate Result

Dell Inc.

PowerEdge XR4520c (Intel Xeon D-2712T, 1.90 GHz)

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

Test Date: Aug-2022
Hardware Availability: Dec-2022
Software Availability: Jul-2022

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
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 Red Hat 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:
    Sub NUMA Cluster : 2-Way Clustering
    Virtualization Technology : Disabled
    System Profile : Custom
    CPU Power Management : Maximum Performance
    CLE : 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 /mnt/ramdisk/cpu2017-1.1.8-ic2022.0-DL/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16a0c64d
running on localhost.localdomain Thu Aug 25 17:35:05 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) D-2712T CPU @ 1.90GHz
    1 "physical id"s (chips)
    8 "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 : 4
    siblings : 8
    physical 0: cores 0 1 2 3

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)
### Platform Notes (Continued)

- **CPU(s):** 8
- **On-line CPU(s) list:** 0-7
- **Thread(s) per core:** 2
- **Core(s) per socket:** 4
- **Socket(s):** 1
- **NUMA node(s):** 1
- **Vendor ID:** GenuineIntel
- **BIOS Vendor ID:** Intel
- **CPU family:** 6
- **Model:** 108
- **Model name:** Intel(R) Xeon(R) D-2712T CPU @ 1.90GHz
- **BIOS Model name:** Intel(R) Xeon(R) D-2712T CPU @ 1.90GHz
- **Stepping:** 1
- **CPU MHz:** 2400.000
- **CPU max MHz:** 1901.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 3800.00
- **L1d cache:** 48K
- **L1i cache:** 32K
- **L2 cache:** 1280K
- **L3 cache:** 15360K
- **NUMA node0 CPU(s):** 0-7
- **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 pse  syscall nx pdpe1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperf perfetto tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl nx smt cmov cx16 sterc dtes64_64bit tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault ebvp cat_l3 invvpclmeng clflushopt窄版 invclmeng lga64 tsc_age damd tsc_cuckoo clflush divremrc p cpuid_fault unlockcpu resets intel_pmeasure avx2 f16c rdrand lahf_lm namemt avx2 ida arat pln pts avx512vmbi umip pkt ospe avx512_vm flexible apvcr mitochondrialdetection

From /proc/cpuinfo cache data

- **cache size:** 15360 KB

From numa

- numactl 'node' might or might not correspond to a physical chip.

- **available:** 1 nodes (0)
  - node 0 cpus: 0 1 2 3 4 5 6 7
  - node 0 size: 128152 MB
  - node 0 free: 118422 MB
  - node distances:
    - node 0: 0
  - 0: 10

From /proc/meminfo

- **MemTotal:** 131228296 KB
- **HugePages_Total:** 0
- **Hugepagesize:** 2048 KB

From /sbin/tuned-adm active

- Current active profile: throughput-performance

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

(Continued on next page)
Platform Notes (Continued)

From /etc/*release* /etc/*version*

```
NAME="Red Hat Enterprise Linux"
VERSION="8.6 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.6"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.6 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.6 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.6 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8::baseos
```

```
uname -a:
Linux localhost.localdomain 4.18.0-372.19.1.el8_6.x86_64 #1 SMP Mon Jul 18 11:14:02 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 and seccomp
- **CVE-2017-5753 (Spectre variant 1):** Mitigation: usercopy/swapgs barriers and __user pointer sanitation
- **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

```
runtime 3 Aug 25 17:34 last-5
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-ic2022.0-DL
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 125G 3.7G 122G 3% /mnt/ramdisk
```

```
Vendor: Dell Inc.
Product: PowerEdge XR4520c
Product Family: PowerEdge
Serial: 1234567
```

Additional information from dmidecode 3.3 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:** 4x 002C069D002C 18ASF4G72PDZ-3GZE1 32 GB 2 rank 3200, configured at 2666

```
BIOS:
BIOS Vendor: Dell Inc.
BIOS Version: 0.5.6
BIOS Date: 08/22/2022
BIOS Revision: 0.5
```
Dell Inc.

PowerEdge XR4520c (Intel Xeon D-2712T, 1.90 GHz)

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

SPECrate®2017_int_base = 28.0
SPECrate®2017_int_peak = 28.6

Test Date: Aug-2022
Hardware Availability: Dec-2022
Software Availability: Jul-2022

Platform Notes (Continued)

(End of data from sysinfo program)

Compiler Version Notes

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<tr>
<td>Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.5.0 Build 20211109_000000</td>
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## Dell Inc.

PowerEdge XR4520c (Intel Xeon D-2712T, 1.90 GHz)

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---

### Base Compiler Invocation

**C benchmarks:**
- icx

**C++ benchmarks:**
- icpx

**Fortran benchmarks:**
- ifort

---

### Base Portability Flags

- 500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
- 502.gcc_r: -DSPEC_LP64
- 505.mcf_r: -DSPEC_LP64
- 520.omnetpp_r: -DSPEC_LP64
- 523.xalanchmk_r: -DSPEC_LP64 -DSPEC_LINUX
- 525.x264_r: -DSPEC_LP64

(Continued on next page)
SPEC CPU®2017 Integer Rate Result

Dell Inc.

PowerEdge XR4520c (Intel Xeon D-2712T, 1.90 GHz)

SPECrated®2017_int_base = 28.0

SPECrated®2017_int_peak = 28.6

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

Test Date: Aug-2022
Hardware Availability: Dec-2022
Software Availability: Jul-2022

Base Portability Flags (Continued)

531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
- w -std=c11 -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/2022.0.1/linux/compiler/lib/intel64_lin
- lqkmalloc

C++ benchmarks:
- w -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/2022.0.1/linux/compiler/lib/intel64_lin
- lqkmalloc

Fortran benchmarks:
- w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
- qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
- auto -mbranches-within-32B-boundaries
- L/opt/intel/oneapi/compiler/2022.0.1/linux/compiler/lib/intel64_lin
- lqkmalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icx

500.perlbench_r: icc

C++ benchmarks:
icpx

Fortran benchmarks:
ifort
## SPEC CPU®2017 Integer Rate Result

**Dell Inc.**

PowerEdge XR4520c (Intel Xeon D-2712T, 1.90 GHz)

**SPECrate®2017_int_base = 28.0**

**SPECrate®2017_int_peak = 28.6**

**CPU2017 License:** 55

**Test Sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test Date:** Aug-2022

**Hardware Availability:** Dec-2022

**Software Availability:** Jul-2022

### Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

### Peak Optimization Flags

**C benchmarks:**

500.perlbench_r: -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/opt/intel/oneapi/compiler/2022.0.1/linux/compiler/lib/intel64_lin
-lqkmalloc

502.gcc_r: -m32
-L/usr/local/intel/compiler/2022.0.0/linux/compiler/lib/ia32_lin
-std=gnu89 -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/jemalloc32-5.0.1/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl, -z, muldefs -xCORE-AVX512 -flto
-O3 -ffast-math -qopt-mem-layout-trans=4 -fno-alias
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2022.0.1/linux/compiler/lib/intel64_lin
-lqkmalloc

557.xz_r: basepeak = yes

**C++ benchmarks:**

520.omnetpp_r: basepeak = yes

(Continued on next page)
## SPEC CPU®2017 Integer Rate Result

### Dell Inc.

**PowerEdge XR4520c (Intel Xeon D-2712T, 1.90 GHz)**

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### Peak Optimization Flags (Continued)

523.xalancbmk_r: basepeak = yes

531.deepsjeng_r: basepeak = yes

541.leela_r: basepeak = yes

Fortran benchmarks:

548.exchange2_r: 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/Dell-ic2022-linux64-v1.0.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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