**Dell Inc.**

**PowerEdge C6520 (Intel Xeon Gold 6346, 3.10 GHz)**

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<tr>
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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Apr-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Feb-2021

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**Threads**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<tbody>
<tr>
<td>perlbench_s</td>
<td>32</td>
<td>8.50</td>
<td>12.4</td>
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<tr>
<td>gcc_s</td>
<td>32</td>
<td>11.2</td>
<td>12.4</td>
</tr>
<tr>
<td>mcf_s</td>
<td>32</td>
<td>11.7</td>
<td>12.4</td>
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<tr>
<td>omnetpp_s</td>
<td>32</td>
<td>11.6</td>
<td>12.4</td>
</tr>
<tr>
<td>xalancbmk_s</td>
<td>32</td>
<td>14.0</td>
<td>12.4</td>
</tr>
<tr>
<td>x264_s</td>
<td>32</td>
<td>17.5</td>
<td>12.4</td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td>32</td>
<td>6.09</td>
<td>12.4</td>
</tr>
<tr>
<td>leela_s</td>
<td>32</td>
<td>5.00</td>
<td>12.4</td>
</tr>
<tr>
<td>exchange2_s</td>
<td>32</td>
<td>19.8</td>
<td>12.4</td>
</tr>
<tr>
<td>xz_s</td>
<td>32</td>
<td>23.5</td>
<td>12.4</td>
</tr>
</tbody>
</table>

---

**Hardware**

- **CPU Name:** Intel Xeon Gold 6346  
- **Max MHz:** 3600  
- **Nominal:** 3100  
- **Enabled:** 32 cores, 2 chips  
- **Orderable:** 1.2 chips  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **L2:** 1.25 MB I+D on chip per core  
- **L3:** 36 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)  
- **Storage:** 125 GB on tmpfs  
- **Other:** None

---

**Software**

- **OS:** Red Hat Enterprise Linux 8.2 (Ootpa)  
  4.18.0-193.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 1.1.2 released Apr-2021  
- **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.
Dell Inc. PowerEdge C6520 (Intel Xeon Gold 6346, 3.10 GHz)

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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</thead>
<tbody>
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<td>600.perlbench_s</td>
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<td>32</td>
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<td>32</td>
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<td>623.xalancbmk_s</td>
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<tr>
<td>625.x264_s</td>
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<td>18.2</td>
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<td>631.deepsjeng_s</td>
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<td>235</td>
<td>6.09</td>
<td>32</td>
<td>235</td>
<td>6.09</td>
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<tr>
<td>641.leela_s</td>
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<td>341</td>
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<td>5.00</td>
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<tr>
<td>648.exchange2_s</td>
<td>32</td>
<td>148</td>
<td>19.8</td>
<td>32</td>
<td>148</td>
<td>19.9</td>
<td></td>
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<tr>
<td>657.xz_s</td>
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<td>263</td>
<td>23.5</td>
<td>32</td>
<td>263</td>
<td>23.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 = "/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/jdé5.0.1-64"
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

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.

Transparent Huge Pages enabled by default
Prior to runcpu invocation

(Continued on next page)
Dell Inc. PowerEdge C6520 (Intel Xeon Gold 6346, 3.10 GHz)

SPEC CPU®2017 Integer Speed Result
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Test Sponsor: Dell Inc. Tested by: Dell Inc.
CPU2017 License: 55 Test Date: Apr-2021
Hardware Availability: Apr-2021
Software Availability: Feb-2021

General Notes (Continued)

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

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

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

Sysinfo program /mnt/ramdisk/cpu2017-1.1.7-ic2021.1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Fri Apr 23 18:44:14 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 6346 CPU @ 3.10GHz
  2 "physical id"s (chips)
  32 "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 : 16
siblings : 16
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
Architecture: x86_64

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

**Dell Inc.**

PowerEdge C6520 (Intel Xeon Gold 6346, 3.10 GHz)

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

---

**Platform Notes (Continued)**

- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 32
- On-line CPU(s) list: 0-31
- Thread(s) per core: 1
- Core(s) per socket: 16
- Socket(s): 2
- NUMA node(s): 2
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 106
- Model name: Intel® Xeon® Gold 6346 CPU @ 3.10GHz
- Stepping: 6
- CPU MHz: 801.311
- BogoMIPS: 6200.00
- Virtualization: VT-x
- L1d cache: 48K
- L1i cache: 32K
- L2 cache: 1280K
- L3 cache: 36864K
- NUMA node0 CPU(s): 0-15
- NUMA node1 CPU(s): 16-31
- 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 cpuid oid gnu_mul gnu_gfcl flushlop
- Flags: (Continued on next page)
Platform Notes (Continued)

node 1 free: 515496 MB
node distances:
  node  0   1
  0: 10  20
  1: 20  10

From /proc/meminfo
  MemTotal:     1056305536 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

/sbin/tuned-adm active
  Current active profile: throughput-performance

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux"
    VERSION="8.2 (Ootpa)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="8.2"
    PLATFORM_ID="platform:el8"
    PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
    ANSI_COLOR="0;31"
  redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
  system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

uname -a:
  Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020
     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 sanitization
CVE-2017-5715 (Spectre variant 2):
  Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling):
  No status reported

(Continued on next page)
Dell Inc.
PowerEdge C6520 (Intel Xeon Gold 6346, 3.10 GHz)

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Test Date: Apr-2021
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Platform Notes (Continued)

CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Apr 23 18:42

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.7-ic2021.1
Filesystem Type Size Used Avail Use% Mounted on
	tmpfs tmpfs 125G 4.4G 121G 4% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
Vendor: Dell Inc.
Product: PowerEdge C6520
Product Family: PowerEdge
Serial: SDPT078

Additional information from dmidecode 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 HMAA8GR7AJR4N-XN 64 GB 2 rank 3200

BIOS:
BIOS Vendor: Dell Inc.
BIOS Version: 1.1.2
BIOS Date: 04/09/2021
BIOS Revision: 1.1

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)
-------------|------------------------|------------------------|
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.
SPEC CPU®2017 Integer Speed Result

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PowerEdge C6520 (Intel Xeon Gold 6346, 3.10 GHz)

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Compiler Version Notes (Continued)

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
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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
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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
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Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort
SPEC CPU®2017 Integer Speed Result

Dell Inc.
PowerEdge C6520 (Intel Xeon Gold 6346, 3.10 GHz)

SPECspeed®2017_int_base = 12.1
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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:
-DSPEC_OPENMP -std=c11 -m64 -fopenmp -Wl,-z,muldefs -xCORE-AVX512
-03 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundsaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-DSPEC_OPENMP -m64 -Wl,-z,muldefs -xCORE-AVX512 -03 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundsaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin/
-1qkmalloc

Fortran benchmarks:
-m64 -xCORE-AVX512 -03 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundsaries

Peak Compiler Invocation

C benchmarks (except as noted below):
icx

600.perlbench_s: icc

C++ benchmarks:
icpx

(Continued on next page)
## Peak Compiler Invocation (Continued)

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`


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

### C++ benchmarks:

- `620.omnetpp_s`: `basepeak = yes`

- `623.xalancbmk_s`: `basepeak = yes`

- `631.deepsjeng_s`: `basepeak = yes`

(Continued on next page)
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### Peak Optimization Flags (Continued)

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:


---

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

Tested with SPEC CPU®2017 v1.1.7 on 2021-04-23 18:44:12-0400.  
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