Dell Inc.

PowerEdge R740 (Intel Xeon Gold 6137, 3.90GHz)

**SPECspeed2017_int_base = 9.46**  
**SPECspeed2017_int_peak = 9.27**

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

**Threads**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
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</thead>
<tbody>
<tr>
<td>perlbench_s</td>
<td>16</td>
<td>8.12</td>
<td>10.0</td>
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<tr>
<td>gcc_s</td>
<td>16</td>
<td>6.65</td>
<td>6.88</td>
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<tr>
<td>mcf_s</td>
<td>16</td>
<td>10.4</td>
<td>10.2</td>
</tr>
<tr>
<td>omnetpp_s</td>
<td>16</td>
<td>11.7</td>
<td>11.8</td>
</tr>
<tr>
<td>xalancbmk_s</td>
<td>16</td>
<td>12.3</td>
<td>11.5</td>
</tr>
<tr>
<td>x264_s</td>
<td>16</td>
<td>5.54</td>
<td>5.48</td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td>16</td>
<td>4.82</td>
<td>4.82</td>
</tr>
<tr>
<td>leela_s</td>
<td>16</td>
<td>14.7</td>
<td>12.3</td>
</tr>
<tr>
<td>exchange2_s</td>
<td>16</td>
<td>9.52</td>
<td>21.3</td>
</tr>
<tr>
<td>xz_s</td>
<td>16</td>
<td>21.8</td>
<td>21.8</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Gold 6137  
- **Max MHz.:** 4100  
- **Nominal:** 3900  
- **Enabled:** 16 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:** 24.75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 12 SP2  
- **kernel 4.4.126-94.22-default**  
- **Compiler:** C/C++: Version 18.0.2.20180210 of Intel C/C++ Compiler for Linux;  
  Fortran: Version 18.0.2.20180210 of Intel Fortran Compiler for Linux  
- **Parallel:** Yes  
- **Firmware:** Version 1.4.5 released May-2018 tested as Mar-2018  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** jemalloc memory allocator v5.0.1
Dell Inc.
PowerEdge R740 (Intel Xeon Gold 6137, 3.90GHz)

SPECspeed2017_int_base = 9.46
SPECspeed2017_int_peak = 9.27

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Threads</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Threads</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>16</td>
<td>257</td>
<td>6.90</td>
<td>16</td>
<td>219</td>
<td>8.11</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>16</td>
<td>399</td>
<td>9.98</td>
<td>16</td>
<td>393</td>
<td>10.1</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>16</td>
<td>405</td>
<td>11.7</td>
<td>16</td>
<td>402</td>
<td>11.8</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>16</td>
<td>255</td>
<td>6.39</td>
<td>16</td>
<td>259</td>
<td>5.54</td>
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<tr>
<td>623.xalanchmk_s</td>
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<td>136</td>
<td>10.4</td>
<td>16</td>
<td>135</td>
<td>10.5</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>16</td>
<td>143</td>
<td>12.3</td>
<td>16</td>
<td>143</td>
<td>12.3</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>16</td>
<td>258</td>
<td>5.54</td>
<td>16</td>
<td>259</td>
<td>5.54</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>16</td>
<td>354</td>
<td>5.82</td>
<td>16</td>
<td>354</td>
<td>5.82</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>16</td>
<td>200</td>
<td>14.7</td>
<td>16</td>
<td>311</td>
<td>9.46</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>16</td>
<td>290</td>
<td>21.3</td>
<td>16</td>
<td>284</td>
<td>21.8</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"

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.0-32:/home/cpu2017/je5.0.0-64"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4
Yes: 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
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 7.4, and the system compiler gcc 4.8.5
## Dell Inc.

PowerEdge R740 (Intel Xeon Gold 6137, 3.90GHz)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.46</td>
<td>9.27</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Test Date:** Jun-2018  
**Hardware Availability:** Jun-2018  
**Tested by:** Dell Inc.  
**Software Availability:** Apr-2018

### Platform Notes

- **BIOS settings:**
  - Sub NUMA Cluster disabled
  - Virtualization Technology disabled
  - System Profile set to Custom
  - CPU Performance set to Maximum Performance
  - C States set to Autonomous
  - C1E disabled
  - Uncore Frequency set to Dynamic
  - Energy Efficiency Policy set to Performance
  - Memory Patrol Scrub disabled
  - Logical Processor disabled
  - CPU Interconnect Bus Link Power Management disabled
  - PCI ASPM L1 Link Power Management disabled
  - Sysinfo program /home/cpu2017/bin/sysinfo

- **Rev:** r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
- **running on linux-wwko Thu Jun 14 11:02:08 2018**

**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 6137 CPU @ 3.90GHz
- 2 "physical id"s (chips)
- 16 "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: 8
- siblings: 8
- physical 0: cores 0 2 3 9 16 19 26 27
- physical 1: cores 0 2 3 9 16 19 26 27

**From lscpu:**
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 16
- On-line CPU(s) list: 0-15
- Thread(s) per core: 1
- Core(s) per socket: 8
- Socket(s): 2
- NUMA node(s): 2
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Gold 6137 CPU @ 3.90GHz
- Stepping: 4

(Continued on next page)
SPEC CPU2017 Integer Speed Result

Dell Inc.

PowerEdge R740 (Intel Xeon Gold 6137, 3.90GHz)

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

SPECspeed2017_int_base = 9.46
SPECspeed2017_int_peak = 9.27

CPU MHz: 3890.831
BogoMIPS: 7781.66
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0,2,4,6,8,10,12,14
NUMA node1 CPU(s): 1,3,5,7,9,11,13,15
Flags: fpu vme de pse tsc msr pae mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmpref eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtrt pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abrm 3dnowprefetch ida arat epb invpcid_single pni pmls
dtherm intel_pt rsb_ctxsw spec_ctrl stibp retpoline kaiser tpr_shadow vnmi
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 3dnow invpcid rtm
cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl
xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc pku ospke

From /proc/cpuinfo cache data
  cache size : 25344 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
  node 0 size: 192048 MB
  node 0 free: 191708 MB
  node 1 cpus: 1 3 5 7 9 11 13 15
  node 1 size: 193370 MB
  node 1 free: 193004 MB
  node distances:
    node 0 1
      0: 10 21
      1: 21 10

From /proc/meminfo
  MemTotal: 394669984 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
  SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*
  SuSE-release:

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

SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 2

# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.

```
os-release:
  NAME="SLES"
  VERSION="12-SP2"
  VERSION_ID="12.2"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp2"
```

uname -a:
```
Linux linux-wwko 4.4.126-94.22-default #1 SMP Wed Apr 11 07:45:03 UTC 2018 (9649989)
x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

<table>
<thead>
<tr>
<th>CVE-2017-5754 (Meltdown):</th>
<th>Mitigation: PTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVE-2017-5753 (Spectre variant 1):</td>
<td>Mitigation: __user pointer sanitization</td>
</tr>
<tr>
<td>CVE-2017-5715 (Spectre variant 2):</td>
<td>Mitigation: IBRS+IBPB</td>
</tr>
</tbody>
</table>

run-level 3 Jun 14 11:01

SPEC is set to: /home/cpu2017

```
Filesystem     Type     Size  Used  Avail Use% Mounted on
/dev/sda2      xfs      892G  161G  731G  19%  /
```

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.

BIOS Dell Inc. 1.4.5 03/30/2018
Memory:
```
20x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666
4x 00AD063200AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666
```

(End of data from sysinfo program)

## Compiler Version Notes

```
CC 600.perlibench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base)
    657.xz_s(base)
```

(Continued on next page)
## Dell Inc.

### PowerEdge R740 (Intel Xeon Gold 6137, 3.90GHz)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>9.27</td>
</tr>
<tr>
<td>SPECspeed2017_int_base</td>
<td>9.46</td>
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</tbody>
</table>

### CPU2017 License:
55

### Test Sponsor:
Dell Inc.

### Hardware Availability:
Jun-2018

### Test Date:
Jun-2018

### Tested by:
Dell Inc.

### Software Availability:
Apr-2018

### Compiler Version Notes (Continued)

---

**icc (ICC) 18.0.2 20180210**

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---

**CC**

600.perlbench\_s(peak) 602.gcc\_s(peak) 605.mcf\_s(peak) 625.x264\_s(peak) 657.xz\_s(peak)

---

**icc (ICC) 18.0.2 20180210**

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

---

**CXXC**

620.omnetpp\_s(base) 623.xalancbmk\_s(base) 631.deepsjeng\_s(base) 641.leela\_s(base)

---

**icpc (ICC) 18.0.2 20180210**

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---

**CXXC**

620.omnetpp\_s(peak) 623.xalancbmk\_s(peak) 631.deepsjeng\_s(peak) 641.leela\_s(peak)

---

**icpc (ICC) 18.0.2 20180210**

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---

**FC**

648.exchange2\_s(base)

---

**ifort (IFORT) 18.0.2 20180210**

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

---

**FC**

648.exchange2\_s(peak)

---

**ifort (IFORT) 18.0.2 20180210**

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
### SPEC CPU2017 Integer Speed Result

**Dell Inc.**

**PowerEdge R740 (Intel Xeon Gold 6137, 3.90GHz)**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Dell Inc.</td>
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<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
</tbody>
</table>

#### Test Date: Jun-2018

#### Hardware Availability: Jun-2018

#### Software Availability: Apr-2018

## Base Compiler Invocation

- **C benchmarks:**
  - `icc -m64 -std=c11`
- **C++ benchmarks:**
  - `icpc -m64`
- **Fortran benchmarks:**
  - `ifort -m64`

## 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:**
  - `-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
  - `-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`
  - `-L/usr/local/je5.0.1-64/lib -ljemalloc`

- **C++ benchmarks:**
  - `-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
  - `-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

- **Fortran benchmarks:**
  - `-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
  - `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs`
  - `-L/usr/local/je5.0.1-64/lib -ljemalloc`
## SPEC CPU2017 Integer Speed Result

Dell Inc.  
PowerEdge R740 (Intel Xeon Gold 6137, 3.90GHz)

<table>
<thead>
<tr>
<th></th>
<th>SPECspeed2017_int_base</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>9.46</td>
<td>9.27</td>
</tr>
</tbody>
</table>

---

### Peak Compiler Invocation

**C benchmarks:**

```bash
icc -m64 -std=c11
```

**C++ benchmarks (except as noted below):**

```bash
icpc -m64
```

```bash
623.xalancbmk_s: icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin
```

**Fortran benchmarks:**

```bash
ifort -m64
```

---

### Peak Portability Flags

```bash
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: -D_FILE_OFFSET_BITS=64 -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
```

---

### Peak Optimization Flags

**C benchmarks:**

```bash
600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -no-prec-div
-DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib
-ljemalloc
```

```bash
602.gcc_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -no-prec-div
-DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

*(Continued on next page)*
Dell Inc.

PowerEdge R740 (Intel Xeon Gold 6137, 3.90GHz)

SPECspeed2017_int_base = 9.46
SPECspeed2017_int_peak = 9.27

Peak Optimization Flags (Continued)

605.mcf_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -03 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

625.x264_s: Same as 602.gcc_s

657.xz_s: Same as 602.gcc_s

C++ benchmarks:

620.omnetpp_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -03 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

623.xalancbmk_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -03 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-32/lib -ljemalloc

631.deepsjeng_s: Same as 620.omnetpp_s

641.leela_s: Same as 620.omnetpp_s

Fortran benchmarks:

-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xCORE-AVX512 -03
-no-prec-div -qopt-prefetch -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc

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-ic18.0-official-linux64.2017-12-21.xml

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

Tested with SPEC CPU2017 v1.0.5 on 2018-06-14 12:02:08-0400.
Originally published on 2018-07-10.