SPEC® CPU2017 Integer Speed Result

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 5118, 2.30 GHz)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base = 7.52</th>
<th>SPECspeed2017_int_peak = Not Run</th>
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</table>

**CPU2017 License:** 55  
**Test Date:**  
**Test Sponsor:** Dell Inc.  
**Hardware Availability:** Sep-2017  
**Tested by:** Dell Inc.  
**Software Availability:** Sep-2017

| Threads | 0 | 1.00 | 2.00 | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.0 | 11.0 | 12.0 | 13.0 | 14.0 | 15.0 | 16.0 | 17.0 | 18.0 | 19.0 | 20.0 |
|---------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 600.perbench_s | 48 | 5.33 | | 7.93 | | 9.91 | | 11.5 | | 12.6 | | 13.3 | | 14.1 | | 14.9 | | 15.6 | | 16.1 | | 16.8 | | 17.2 |
| 602.gcc_s | 48 | 4.74 | | 8.14 | | 10.0 | | 11.5 | | 12.6 | | 13.3 | | 14.1 | | 14.9 | | 15.6 | | 16.0 | | 16.8 | | 17.2 |
| 605.mcf_s | 48 | 4.45 | | 11.5 | | 19.3 | | 27.6 | | 36.0 | | 44.3 | | 52.6 | | 60.9 | | 69.0 | | 77.3 | | 85.5 | | 93.8 |
| 620.omnetpp_s | 48 | 3.74 | | 5.31 | | 6.91 | | 8.51 | | 10.0 | | 11.5 | | 12.6 | | 13.3 | | 14.1 | | 14.9 | | 15.6 | | 16.1 |
| 623.xalancmk_s | 48 | 4.45 | | 8.14 | | 10.0 | | 11.5 | | 12.6 | | 13.3 | | 14.1 | | 14.9 | | 15.6 | | 16.0 | | 16.8 | | 17.2 |
| 625.x264_s | 48 | | | | | | | | | | | | | | | | | | | | |
| 631.deepsjeng_s | 48 | | | | | | | | | | | | | | | | | | | | |
| 641.leela_s | 48 | | | | | | | | | | | | | | | | | | | | |
| 648.exchange2_s | 48 | | | | | | | | | | | | | | | | | | | | |
| 657.xz_s | 48 | | | | | | | | | | | | | | | | | | | | |

**Hardware**

- **CPU Name:** Intel Xeon Gold 5118  
- **Max MHz.:** 3200  
- **Nominal:** 2300  
- **Enabled:** 24 cores, 2 chips, 2 threads/core  
- **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:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)  
- **Storage:** 480GB SATA SSD  
- **Other:** None

**Software**

- **OS:** CentOS Linux release 7.4.1708 (Core)  
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux  
- **Parallel:** Yes  
- **Firmware:** Version 1.0.8 released Jul-2017  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** jemalloc: jemalloc memory allocator library V5.0.1;
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### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
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<td>336</td>
<td>5.29</td>
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<tr>
<td>648.exchange2_s</td>
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<td>255</td>
<td>11.5</td>
<td>255</td>
<td>11.5</td>
<td>254</td>
<td>11.6</td>
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<td>657.xz_s</td>
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**SPECspeed2017_int_base = 7.52**  
**SPECspeed2017_int_peak = Not Run**

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"`
- `OMP_STACKSIZE = "192M"`

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4.  
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: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;  
jemalloc: built with the RedHat Enterprise 7.4,  
and the system compiler gcc 4.8.5;  
jemalloc: sources available via jemalloc.net

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.  
No: 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.  
No: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)

(Continued on next page)
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

**General Notes (Continued)**

is mitigated in the system as tested and documented.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

**Platform Notes**

BIOS settings:
Virtualization Technology disabled
System Profile set to Custom
CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance
Turbo Boost enabled
C States disabled
Memory Patrol Scrub disabled
PCI ASPM L1 Link Power Management disabled
Sysinfo program /root/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
running on localhost.localdomain Thu Nov 30 17:22:52 2017

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 5118 CPU @ 2.30GHz
  2 "physical id"s (chips)
  48 "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 : 24
  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

(Continued on next page)
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**SPECspeed2017_int_base = 7.52**

**SPECspeed2017_int_peak = Not Run**

---

**Platform Notes (Continued)**

From lscpu:
- **Architecture:** x86_64
- **CPU op-mode(s):** 32-bit, 64-bit
- **Byte Order:** Little Endian
- **CPU(s):** 48
- **On-line CPU(s) list:** 0-47
- **Thread(s) per core:** 2
- **Core(s) per socket:** 12
- **Socket(s):** 2
- **NUMA node(s):** 2
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Gold 5118 CPU @ 2.30GHz
- **Stepping:** 4
- **CPU MHz:** 2300.000
- **BogoMIPS:** 4600.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 16896K

NUMA node0 CPU(s):
0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46
NUMA node1 CPU(s):
1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47

**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 aperfmperf eagerfpu nmi pml3sz cpuid

**/proc/cpuinfo 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 24 26 28 30 32 34 36 38 40 42 44 46
  - node 0 size: 96965 MB
  - node 0 free: 94102 MB
  - node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47

(Continued on next page)
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</tbody>
</table>

**Platform Notes (Continued)**

- node 1 size: 98304 MB
- node 1 free: 95662 MB
- node distances:
  - node 0 1
  - 0: 10 21
  - 1: 21 10

From /proc/meminfo

```
MemTotal:       196690028 kB
HugePages_Total:     128
Hugepagesize:       2048 kB
```

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

```
centos-release: CentOS Linux release 7.4.1708 (Core)
centos-release-upstream: Derived from Red Hat Enterprise Linux 7.4 (Source)
os-release:
  NAME=“CentOS Linux"
  VERSION=“7 (Core)"
  ID=“centos"
  ID_LIKE=“rhel fedora"
  VERSION_ID=“7"
  PRETTY_NAME=“CentOS Linux 7 (Core)"
  ANSI_COLOR=“0;31"
  CPE_NAME=“cpe:/o:centos:centos:7"
redhat-release: CentOS Linux release 7.4.1708 (Core)
system-release: CentOS Linux release 7.4.1708 (Core)
system-release-cpe: cpe:/o:centos:centos:7
```

```
uname -a:
Linux localhost.localdomain 3.10.0-693.5.2.el7.x86_64 #1 SMP Fri Oct 20 20:32:50 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Nov 30 17:21
```

**SPEC is set to:** /root/cpu2017

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda2</td>
<td>xfs</td>
<td>433G</td>
<td>18G</td>
<td>415G</td>
<td>5%</td>
<td>/</td>
</tr>
</tbody>
</table>

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. 1.0.8 07/12/2017

**Memory:**

- 12x 002C00B3002C 18ASF2G72PD2-2G6D1 16 GB 2 rank 2666, configured at 2400
- 4x Not Specified Not Specified

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**Platform Notes (Continued)**

(End of data from sysinfo program)

**Compiler Version Notes**

```plaintext
==============================================================================
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base)  
657.xz_s(base)  
==============================================================================
icc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)  
641.leela_s(base)  
==============================================================================
icpc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
FC  648.exchange2_s(base)  
==============================================================================
ifort (IFORT) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

**Base Compiler Invocation**

C benchmarks:  
icc

C++ benchmarks:  
icpc

Fortran benchmarks:  
ifort

**Base Portability Flags**

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64  
602.gcc_s: -DSPEC_LP64

(Continued on next page)
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**Base Portability Flags (Continued)**

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:**
- Wl,-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:**
- Wl,-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:**
- Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
- qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte  
- L/usr/local/je5.0.1-64/lib -ljemalloc

---

**Base Other Flags**

**C benchmarks:**
- m64 -std=c11

**C++ benchmarks:**
- m64

**Fortran benchmarks:**
- m64

The flags files that were used to format this result can be browsed at

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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 CPU2017 v1.0.2 on 2017-11-30 18:22:52-0500.
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