## SPEC® CPU2017 Integer Speed Result

**Fujitsu**  
PRIMERGY RX2540 M5, Intel Xeon Gold 6244, 3.60 GHz  

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>10.8</th>
</tr>
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<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Apr-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019

### Hardware

**CPU Name:** Intel Xeon Gold 6244  
**Max MHz.:** 4400  
**Nominal:** 3600  
**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:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)  
**Storage:** 1 x SATA SSD 1.1 TB  
**Other:** None

### Software

**OS:** SUSE Linux Enterprise Server 15  
4.12.14-25.28-default  
**Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++  
Compiler Build 20181018 for Linux;  
Fortran: Version 19.0.1.144 of Intel Fortran  
Compiler Build 20181018 for Linux  
**Parallel:** Yes  
**Firmware:** Fujitsu BIOS Version V5.0.0.14 R1.8.0 for D3384-B1x. Released Jan-2019 tested as V5.0.0.14 R1.6.0 for D3384-B1x Apr-2019  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** jemalloc memory allocator V5.0.1

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_int_base (10.8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s 16</td>
<td>7.54</td>
</tr>
<tr>
<td>602.gcc_s 16</td>
<td>10.5</td>
</tr>
<tr>
<td>605.mcf_s 16</td>
<td>13.6</td>
</tr>
<tr>
<td>620.omnetpp_s 16</td>
<td>8.15</td>
</tr>
<tr>
<td>623.xalancbmk_s 16</td>
<td>13.9</td>
</tr>
<tr>
<td>625.x264_s 16</td>
<td>15.3</td>
</tr>
<tr>
<td>631.deepsjeng_s 16</td>
<td>5.97</td>
</tr>
<tr>
<td>641.leela_s 16</td>
<td>5.37</td>
</tr>
<tr>
<td>648.exchange2_s 16</td>
<td>15.9</td>
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<tr>
<td>657.xz_s 16</td>
<td>22.5</td>
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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>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>16</td>
<td>236</td>
<td>7.51</td>
<td>235</td>
<td>7.54</td>
<td>235</td>
<td>7.55</td>
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<tr>
<td>602.gcc_s</td>
<td>16</td>
<td>378</td>
<td><strong>10.5</strong></td>
<td>377</td>
<td>10.6</td>
<td>380</td>
<td>10.5</td>
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<tr>
<td>605.mcf_s</td>
<td>16</td>
<td>347</td>
<td><strong>13.6</strong></td>
<td>346</td>
<td>13.7</td>
<td>348</td>
<td>13.6</td>
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<tr>
<td>620.omnetpp_s</td>
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<td>202</td>
<td>8.07</td>
<td><strong>200</strong></td>
<td><strong>8.15</strong></td>
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<tr>
<td>623.xalancbmk_s</td>
<td>16</td>
<td>102</td>
<td>13.8</td>
<td>102</td>
<td>13.9</td>
<td><strong>102</strong></td>
<td><strong>13.9</strong></td>
</tr>
<tr>
<td>625.x264_s</td>
<td>16</td>
<td>116</td>
<td>15.2</td>
<td><strong>116</strong></td>
<td><strong>15.3</strong></td>
<td>115</td>
<td>15.3</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>16</td>
<td>240</td>
<td><strong>5.97</strong></td>
<td>240</td>
<td>5.97</td>
<td>239</td>
<td>5.99</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>16</td>
<td>318</td>
<td><strong>5.37</strong></td>
<td>318</td>
<td>5.37</td>
<td>318</td>
<td>5.37</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>16</td>
<td>185</td>
<td>15.9</td>
<td><strong>185</strong></td>
<td><strong>15.9</strong></td>
<td>186</td>
<td>15.8</td>
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<tr>
<td>657.xz_s</td>
<td>16</td>
<td>275</td>
<td><strong>22.5</strong></td>
<td>275</td>
<td>22.5</td>
<td>275</td>
<td>22.4</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/Benchmark/cascadelake_speccpu2017_speed_int/lib/ia32"
  - LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/Benchmark/cascadelake_speccpu2017_speed_int/lib/intel64"
  - LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/Benchmark/cascadelake_speccpu2017_speed_int/je5.0.1-32"
  - OMP_STACKSIZE = "192M"

- Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5
- Transparent Huge Pages enabled by default
- Prior to runcpu invocation
  ```
  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

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.
Platform Notes

BIOS configuration:
Patrol Scrub = Disabled
Override OS Energy Performance = Enabled
Energy Performance = Performance
Fan Control = Full
Sub NUMA Clustering = Disabled
WR CRC feature Control = Disabled
Hyper-Threading = Disabled

Sysinfo program /home/Benchmark/cascadelake_speccpu2017_speed_int/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcd8f2999c33d61f6485e45859ea9
running on linux-947a Fri Apr 19 09:51:59 2019

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 6244 CPU @ 3.60GHz
  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 2 3 4 9 17 18 25 27
  physical 1: cores 2 3 4 8 11 17 25 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 6244 CPU @ 3.60GHz
Stepping: 6
CPU MHz: 3600.000
CPU max MHz: 4400.0000
CPU min MHz: 1200.0000
BogoMIPS: 7200.00
Virtualization: VT-x
**Platform Notes (Continued)**

- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 25344K
- NUMA node0 CPU(s): 0-7
- NUMA node1 CPU(s): 8-15
- 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 cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 sdbg fma cx16 xtrm pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abml fmsk shr cpuid cs readonly

/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 1 2 3 4 5 6 7
- node 0 size: 385505 MB
- node 0 free: 385046 MB
- node 1 cpus: 8 9 10 11 12 13 14 15
- node 1 size: 386840 MB
- node 1 free: 386365 MB
- node distances:
  - node 0: 0 1
  - node 1: 10 21

From /proc/meminfo
- MemTotal: 790882356 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
- os-release:
  - NAME="SLES"
  - VERSION="15"
  - VERSION_ID="15"
  - PRETTY_NAME="SUSE Linux Enterprise Server 15"

(Continued on next page)
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SPECspeed2017_int_base = 10.8

SPECspeed2017_int_peak = Not Run

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Platform Notes (Continued)

ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15"

uname -a:
Linux linux-947a 4.12.14-25.28-default #1 SMP Wed Jan 16 20:00:47 UTC 2019 (dd6077c)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Apr 19 09:46

SPEC is set to: /home/Benchmark/cascadelake_speccpu2017_speed_int
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 1.1T 147G 927G 14% /home

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 FUJITSU // American Megatrends Inc. V5.0.0.14 R1.6.0 for D3384-B1x
04/09/2019
Memory:
24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(base)
==============================================================================

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
(Continued on next page)
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CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Compiler Version Notes (Continued)

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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.xalanchmk_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

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Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -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=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

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 CPU2017 v1.0.5 on 2019-04-18 20:51:58-0400.