Fujitsu PRIMERGY CX2560 M5, Intel Xeon Gold 6230R, 2.10 GHz

**SPEC CPU®2017 Integer Rate Result**

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<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>263</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Mar-2020  
**Hardware Availability:** Feb-2020  
**Software Availability:** May-2019

### Copies

<table>
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**SPECrate®2017_int_base (263)**

### Hardware

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**CPU Name:** Intel Xeon Gold 6230R  
**Max MHz:** 4000  
**Nominal:** 2100  
**Enabled:** 52 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:** 35.75 MB I+D on chip per chip  
**Other:** None  
**Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)  
**Storage:** 1 x SATA M.2 SSD, 240 GB  
**Other:** None

### Software

**OS:** SUSE Linux Enterprise Server 15  
**Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux  
**Parallel:** No  
**Firmware:** Fujitsu BIOS Version V1.0.0.0 R1.13.0 for D3854-B1x released Feb-2020  
**File System:** btrfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** None  
**Power Management:** BIOS set to prefer performance at the cost of additional power usage
## Fujitsu

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<td>634</td>
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</table>

### Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl 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"

Kernel Boot Parameter set with: nohz_full=1-103

### Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```bash
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-1.1.0/lib/intel64:/home/Benchmark/speccpu20 17-1.1.0/lib/ia32:/home/Benchmark/speccpu2017-1.1.0/je5.0.1-32"
```

### General Notes

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

Filesystem page cache synced and cleared with:

(Continued on next page)
General Notes (Continued)

sync; echo 3> /proc/sys/vm/drop_caches
runcpu command invoked through numacl i.e.:
umacl --interleave=all runcpu <etc>
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.

Platform Notes

BIOS configuration:
Adjacent Cache Line Prefetch = Disabled
DCU Ip Prefetcher = Disabled
DCU Streamer Prefetcher = Disabled
Power Technology = Custom
Energy Performance = Balanced Performance
Uncore Frequency Scaling = Disabled
Sub NUMA Clustering = Enabled
Stale AtoS = Enabled
LLC Prefetch = Enabled

Sysinfo program /home/Benchmark/speccpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed65e6e46a485a0011
running on linux-dftw Wed Mar 11 09:53:56 2020

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 6230R CPU @ 2.10GHz
  2 "physical id"s (chips)
  104 "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 : 26
siblings : 52
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29

From lscpu:
Architecture: x86_64
SPEC CPU®2017 Integer Rate Result

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Software Availability: May-2019

SPECrate®2017_int_base = 263
SPECrate®2017_int_peak = Not Run

Platform Notes (Continued)

CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 104
On-line CPU(s) list: 0-103
Thread(s) per core: 2
Core(s) per socket: 26
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6230R CPU @ 2.10GHz
Stepping: 7
CPU MHz: 2100.000
CPU max MHz: 4000.0000
CPU min MHz: 1000.0000
BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-3, 7-9, 13-15, 20-22, 52-55, 59-61, 65-67, 72-74
NUMA node1 CPU(s): 4-6, 10-12, 16-19, 23-25, 56-58, 62-64, 68-71, 75-77
NUMA node2 CPU(s): 26-29, 33-35, 39-41, 46-48, 78-81, 85-87, 91-93, 98-100
NUMA node3 CPU(s): 30-32, 36-38, 42-45, 49-51, 82-84, 88-90, 94-97, 101-103
Flags:

fpu vme de pse tsc msr pae mce 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 cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat_l3 cdp_l3

/p proc/cpuinfo cache data

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

From numactl --hardware: WARNING: a numactl 'node' might or might not correspond to a physical chip.

cache size : 36608 KB

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

```
node 0 free: 95019 MB
node 1 cpus: 4 5 6 10 11 12 16 17 18 19 23 24 25 56 57 58 62 63 64 68 69 70 71 75 76 77
node 1 size: 96726 MB
node 1 free: 96461 MB
node 2 cpus: 26 27 28 29 33 34 35 39 40 41 46 47 48 78 79 80 81 85 86 87 91 92 93 98 99 100
node 2 size: 96756 MB
node 2 free: 96427 MB
node 3 cpus: 30 31 32 36 37 38 42 43 44 45 49 50 51 82 83 84 88 89 90 94 95 96 97 101 102 103
node 3 size: 96753 MB
node 3 free: 96492 MB
node distances:
  node 0 1 2 3
  0: 10 11 19 19
  1: 11 10 19 19
  2: 19 19 10 11
  3: 19 19 11 10
```

From /proc/meminfo
- MemTotal: 394898032 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
- NAME="SLES"
- VERSION="15"
- VERSION_ID="15"
- PRETTY_NAME="SUSE Linux Enterprise Server 15"
- ID="sles"
- ID_LIKE="suse"
- ANSI_COLOR="0;32"
- CPE_NAME="cpe:/o:suse:sles:15"

```
uname -a:
Linux linux-dftw 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-2018-3620 (L1 Terminal Fault): Not affected
- Microarchitectural Data Sampling: No status reported
- 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: __user pointer sanitization

(Continued on next page)
Platform Notes (Continued)

CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Mar 11 09:51

SPEC is set to: /home/Benchmark/speccpu2017-1.1.0

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 238G 97G 141G 41% /home

From /sys/devices/virtual/dmi/id
BIOS: FUJITSU V1.0.0.0 R1.13.0 for D3854-Blx 02/06/2020
Vendor: FUJITSU
Product: PRIMERGY CX2560 M5
Product Family: SERVER
Serial: MAAG100014

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:
- 5x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933
- 4x Not Specified Not Specified
- 7x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

=================================================================================
| C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) |
|         | 525.x264_r(base) 557.xz_r(base)               |
|         |=================================================================================
| Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.0.4.227 Build 20190416 |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved. |

=================================================================================
| C++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) |
|         | 541.leela_r(base)               |
|         |=================================================================================
| Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.0.4.227 Build 20190416 |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved. |

(Continued on next page)
Compiler Version Notes (Continued)

==============================================================================
Fortran | 548.exchange2_r(base)
==============================================================================

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
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

Base Optimization Flags

C benchmarks:
-W1, -z,nuldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-ipo -opt-mem-layout-trans=4
-ll/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-1qkmalloc

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

**C++ benchmarks:**
- `-Wl,-z,muldefs` -xCORE-AVX512 -ipo -O3 -no-prec-div
- `-qopt-mem-layout-trans=4`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64`
- `-lqkmalloc`

**Fortran benchmarks:**
- `-Wl,-z,muldefs` -xCORE-AVX512 -ipo -O3 -no-prec-div
- `-qopt-mem-layout-trans=4` -nostandard-realloc-lhs -align array32byte
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64`
- `-lqkmalloc`

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: