**SPEC CPU®2017 Floating Point Rate Result**

**Fujitsu**
PRIMERGY RX2540 M5, Intel Xeon Gold 6230R, 2.10 GHz

<table>
<thead>
<tr>
<th>CPU2017 License: 19</th>
<th>Test Date: Mar-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Fujitsu</td>
<td>Hardware Availability: Feb-2020</td>
</tr>
<tr>
<td>Tested by: Fujitsu</td>
<td>Software Availability: May-2019</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_fp_base = 239</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>104</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>104</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>104</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>104</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>104</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>104</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>104</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>104</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>104</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>104</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>104</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>104</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>104</td>
</tr>
</tbody>
</table>

**Hardware**

- **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:** 768 GB (24 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 4.12.14-25.28-default
- **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 V5.0.0.14 R1.18.0 for D3384-B1x released Apr-2020
- **File System:** xfs
- **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
SPEC CPU®2017 Floating Point Rate Result

Fujitsu
PRIMERGY RX2540 M5, Intel Xeon Gold 6230R, 2.10 GHz

SPECrate®2017_fp_base = 239
SPECrate®2017_fp_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>507.cactuBSSN_r</td>
<td>104</td>
<td>608</td>
<td>216</td>
<td>610</td>
<td>216</td>
<td>608</td>
<td>217</td>
<td>608</td>
<td>216</td>
<td>608</td>
<td>217</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>104</td>
<td>514</td>
<td>192</td>
<td>515</td>
<td>192</td>
<td>516</td>
<td>191</td>
<td>516</td>
<td>191</td>
<td>516</td>
<td>191</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>104</td>
<td>2148</td>
<td>127</td>
<td>2162</td>
<td>126</td>
<td>2171</td>
<td>125</td>
<td>2171</td>
<td>125</td>
<td>2171</td>
<td>125</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>104</td>
<td>849</td>
<td>286</td>
<td>850</td>
<td>286</td>
<td>847</td>
<td>287</td>
<td>847</td>
<td>287</td>
<td>847</td>
<td>287</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>104</td>
<td>885</td>
<td>124</td>
<td>884</td>
<td>124</td>
<td>883</td>
<td>124</td>
<td>883</td>
<td>124</td>
<td>883</td>
<td>124</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>104</td>
<td>1040</td>
<td>224</td>
<td>1026</td>
<td>227</td>
<td>1028</td>
<td>227</td>
<td>1028</td>
<td>227</td>
<td>1028</td>
<td>227</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>104</td>
<td>596</td>
<td>266</td>
<td>597</td>
<td>266</td>
<td>595</td>
<td>266</td>
<td>595</td>
<td>266</td>
<td>595</td>
<td>266</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>104</td>
<td>646</td>
<td>281</td>
<td>646</td>
<td>282</td>
<td>645</td>
<td>282</td>
<td>645</td>
<td>282</td>
<td>645</td>
<td>282</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>104</td>
<td>412</td>
<td>628</td>
<td>411</td>
<td>627</td>
<td>412</td>
<td>627</td>
<td>412</td>
<td>627</td>
<td>412</td>
<td>627</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>104</td>
<td>382</td>
<td>459</td>
<td>384</td>
<td>456</td>
<td>384</td>
<td>456</td>
<td>384</td>
<td>456</td>
<td>384</td>
<td>456</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>104</td>
<td>2326</td>
<td>174</td>
<td>2326</td>
<td>174</td>
<td>2330</td>
<td>174</td>
<td>2330</td>
<td>174</td>
<td>2330</td>
<td>174</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>104</td>
<td>1664</td>
<td>99.3</td>
<td>1662</td>
<td>99.4</td>
<td>1659</td>
<td>99.6</td>
<td>1659</td>
<td>99.6</td>
<td>1659</td>
<td>99.6</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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
Process tuning settings:
echo 10000000 > /proc/sys/kernel/sched_min_granularity_ns

Environment Variables Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-1.1.0/lib/intel64"

General Notes
Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5

(Continued on next page)
Fujitsu
PRIMERGY RX2540 M5, Intel Xeon Gold 6230R, 2.10 GHz

| SPECrate®2017_fp_base = | 239 |
| SPECrate®2017_fp_peak = | Not Run |

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Test Date: Mar-2020
Hardware Availability: Feb-2020
Software Availability: May-2019

General Notes (Continued)

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
runcpu command invoked through numactl i.e.:
umactl --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:
Patrol Scrub = Disabled
WR CRC feature Control = Disabled
Fan Control = Full

Sysinfo program /home/Benchmark/speccpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
running on RX2540M5_CLXR Thu Mar 5 17:06:54 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
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 104

(Continued on next page)
**SPEC CPU®2017 Floating Point Rate Result**

**Fujitsu**

**PRIMERGY RX2540 M5, Intel Xeon Gold 6230R, 2.10 GHz**

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>239</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak</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

### Platform Notes (Continued)

- **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 cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx  pdpes1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx 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 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invvpicid_single intel_pcin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbases tsc_adjust bmi1 hle avx2 smep bmi2  erts invvpicid rtm cmp mpx rdta avx512f avx512dq rdseed adx smap clflushopt clwb intell_pt avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv xsavec cmp_l1c cmp_occmp llc cmp_mb_total cmp_mb_local dtherm ida arat pln pts hwp hwp_act_window hwp_epk hwp_pkg_req pku ospke avx512_vnni flush_l1d arch_capabilities

```
/proc/cpuinfo cache data
cache size : 36608 KB
```

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

- **available:** 4 nodes (0-3)
- **node 0 cpus:** 0 1 2 3 7 8 9 13 14 15 20 21 22 52 53 54 55 59 60 61 65 66 67 72 73 74
- **node 0 size:** 191974 MB
- **node 0 free:** 191452 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:** 193530 MB

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Fujitsu
PRIMERGY RX2540 M5, Intel Xeon Gold 6230R, 2.10 GHz

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

SPECrates®2017_fp_base = 239
SPECrates®2017_fp_peak = Not Run

Test Date: Mar-2020
Hardware Availability: Feb-2020
Software Availability: May-2019

Platform Notes (Continued)

node 1 free: 193230 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: 193501 MB
node 2 free: 193229 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: 193318 MB
node 3 free: 193053 MB
node distances:
  node 0 1 2 3
  0: 10 11 21 21
  1: 11 10 21 21
  2: 21 21 10 11
  3: 21 21 11 10

From /proc/meminfo
MemTotal: 790861324 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"
    ID="sles"
    ID_LIKE="suse"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:15"

  uname -a:
    Linux RX2540M5_CLXR 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
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

(Continued on next page)
Platform Notes (Continued)

run-level 3 Mar 5 17:04

SPEC is set to: /home/Benchmark/speccpu2017-1.1.0
    Filesystem   Type  Size  Used  Avail   Use% Mounted on
/dev/sda5      xfs   191G  113G   78G  60%  /home

From /sys/devices/virtual/dmi/id
    BIOS: FUJITSU // American Megatrends Inc. V5.0.0.14 R1.18.0 for D3384-B1x
          02/10/2020
    Vendor: FUJITSU
    Product: PRIMERGY RX2540 M5
    Product Family: SERVER
    Serial: YMSQXXXXXX

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:
          24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| C               | 519.lbm_r(base) 538.imagick_r(base) 544.nab_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++             | 508.namd_r(base) 510.parest_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++, C          | 511.povray_r(base) 526.blender_r(base) |
                           |     |
==============================================================================
| Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, |
  Version 19.0.4.227 Build 20190416 |
(Continued on next page)
Fujitsu
PRIMERGY RX2540 M5, Intel Xeon Gold 6230R, 2.10 GHz

SPECrate®2017_fp_base = 239
SPECrate®2017_fp_peak = Not Run

Compiler Version Notes (Continued)

Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

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.

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.

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
**Base Compiler Invocation (Continued)**

Fortran benchmarks:
ifort -m64

Benmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

**Base Portability Flags**

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

**Base Optimization Flags**

C benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

C++ benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Fortran benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
Fujitsu

PRIMERGY RX2540 M5, Intel Xeon Gold 6230R, 2.10 GHz

SPECrate®2017_fp_base = 239

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Test Date: Mar-2020
Hardware Availability: Feb-2020
Software Availability: May-2019

### Base Optimization Flags (Continued)

Fortran benchmarks (continued):
- `qopt-mem-layout-trans=4` `-auto` `-nostandard-realloc-lhs`
- `align array32byte`

Benchmarks using both Fortran and C:
- `xCORE-AVX2` `-ipo -O3` `-no-prec-div` `-qopt-prefetch` `-ffinite-math-only`
- `qopt-mem-layout-trans=4` `-auto` `-nostandard-realloc-lhs`
- `align array32byte`

Benchmarks using both C and C++:
- `xCORE-AVX2` `-ipo -O3` `-no-prec-div` `-qopt-prefetch` `-ffinite-math-only`
- `qopt-mem-layout-trans=4`

Benchmarks using Fortran, C, and C++:
- `xCORE-AVX2` `-ipo -O3` `-no-prec-div` `-qopt-prefetch` `-ffinite-math-only`
- `qopt-mem-layout-trans=4` `-auto` `-nostandard-realloc-lhs`
- `align array32byte`

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:

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU®2017 v1.1.0 on 2020-03-05 03:06:53-0500.
Originally published on 2020-04-14.