**Fujitsu**

PRIMERGY RX2540 M6, Intel Xeon Platinum 8362, 2.80GHz

<table>
<thead>
<tr>
<th>SPECr®2017_fp_base</th>
<th>429</th>
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</thead>
<tbody>
<tr>
<td>SPECr®2017_fp_peak</td>
<td>Not Run</td>
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</table>

**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Jun-2021  
**Hardware Availability:** Aug-2021  
**Software Availability:** Dec-2020

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<td>Dec-2020</td>
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### Hardware

- **CPU Name:** Intel Xeon Platinum 8362  
- **Max MHz:** 3600  
- **Nominal:** 2800  
- **Enabled:** 64 cores, 2 chips  
- **Orderable:** 1,2 chips  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **L2:** 1.25 MB I+D on chip per core  
- **L3:** 48 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R)  
- **Storage:** 1 x SATA M.2 SSD, 480GB  
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 15 SP2  
  5.3.18-22-default  
- **Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++  
  Compiler Build 202011113 for Linux;  
  Fortran: Version 2021.1 of Intel Fortran  
  Compiler Classic Build 20201112 for Linux  
- **Parallel:** No  
- **Firmware:** Fujitsu BIOS Version V1.0.0.0 R1.6.0 for D3891-A1x, Released Jun-2021  
  tested as V1.0.0.0 R1.2.0 for D3891-A1x Apr-2021  
- **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  
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage

### Test Results

<table>
<thead>
<tr>
<th>SPECrate</th>
<th>Value</th>
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<tbody>
<tr>
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<tr>
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<td>64</td>
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<tr>
<td>549.fotonik3d_r</td>
<td>64</td>
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<tr>
<td>554.roms_r</td>
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### Copies

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<td>64</td>
</tr>
</tbody>
</table>

### Graph

- **SPECr®2017_fp_base** | 429
- **SPECr®2017_fp_peak** | Not Run

- **Hardware**
  - **CPU Name:** Intel Xeon Platinum 8362
  - **Max MHz:** 3600
  - **Nominal:** 2800
  - **Enabled:** 64 cores, 2 chips
  - **Orderable:** 1,2 chips
  - **Cache L1:** 32 KB I + 48 KB D on chip per core
  - **L2:** 1.25 MB I+D on chip per core
  - **L3:** 48 MB I+D on chip per chip
  - **Other:** None
  - **Memory:** 1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R)
  - **Storage:** 1 x SATA M.2 SSD, 480GB
  - **Other:** None

- **Software**
  - **OS:** SUSE Linux Enterprise Server 15 SP2
    5.3.18-22-default
  - **Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++
    Compiler Build 20201113 for Linux;
    Fortran: Version 2021.1 of Intel Fortran
    Compiler Classic Build 20201112 for Linux
  - **Parallel:** No
  - **Firmware:** Fujitsu BIOS Version V1.0.0.0 R1.6.0 for D3891-A1x, Released Jun-2021
    tested as V1.0.0.0 R1.2.0 for D3891-A1x Apr-2021
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  - **Power Management:** BIOS set to prefer performance at the cost of additional power usage
SPEC CPU®2017 Floating Point Rate Result

Fujitsu
PRIMERGY RX2540 M6, Intel Xeon Platinum 8362, 2.80GHz

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

SPECrates®
SPEC®2017_fp_base = 429
SPEC®2017_fp_peak = Not Run

Results Table

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</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"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = ""/home/Benchmark/speccpu-1.1.8_ic21.1/lib/intel64:/home/Benchmark/speccpu-1.1.8_ic21.1/je5.0.1-64"
MALLOC_CONF = "retain:true"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7940X CPU + 64GB RAM memory using openSUSE Leap 15.2
Transparent Huge Pages enabled by default

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

Fujitsu
PRIMERGY RX2540 M6, Intel Xeon Platinum 8362, 2.80GHz

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

General Notes (Continued)

Prior to runcpu invocation
Filesystem page cache synced and cleared with:
 sync; echo 3> /proc/sys/vm/drop_caches
runcpu command invoked through numaclt i.e.:
numactl --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:
Hyper Threading = Disabled
Adjacent Cache Line Prefetch = Disabled
DCU Streamer Prefetcher = Disabled
Intel Virtualization Technology = Disabled
Override OS Energy Performance = Enabled
Energy Performance = Performance
CPU C1E Support = Disabled
Patrol Scrub = Enabled
SNC = Enable SNC2
FAN Control = Full

Sysinfo program /home/Benchmark/speccpu-1.1.8_ic21.1/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca64d4 running on localhost Sat Jun 5 18:39:04 2021

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) Platinum 8362 CPU @ 2.80GHz 2 "physical id"s (chips) 64 "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 : 32
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

(Continued on next page)
Fujitsu
PRIMERGY RX2540 M6, Intel Xeon Platinum 8362, 2.80GHz

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---

**Platform Notes (Continued)**

```
25 26 27 28 29 30 31
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
25 26 27 28 29 30 31

From lscpu from util-linux 2.33.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 46 bits physical, 57 bits virtual
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 1
Core(s) per socket: 32
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8362 CPU @ 2.80GHz
Stepping: 6
CPU MHz: 800.000
CPU max MHz: 3600.0000
CPU min MHz: 800.0000
BogoMIPS: 5600.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 49152K
NUMA node0 CPU(s): 0-15
NUMA node1 CPU(s): 16-31
NUMA node2 CPU(s): 32-47
NUMA node3 CPU(s): 48-63
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 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
xptr 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 invpcid_single ssbd
mba ibrs ibpb stibp ibrs_enabled tpr_shadow vnmi flexpriority ept vpid ept_ad
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f
avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni
avx512bw avx512v1 xsaveopt xSAVE xsavecoll xgetbv1 xsavecoll cqm_llc cqm_ocap_llc cqm_mbb_total
cqm_mbb_local wbdnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp
hwp_pkg_req avx512vbm umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
avx512_bitalg tme avx512_vpopcntdq la57 rdrid md_clear pconfi arch_capabilities
```

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

/proc/cpuinfo cache data  
   cache size : 49152 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 4 5 6 7 8 9 10 11 12 13 14 15  
node 0 size: 257649 MB  
node 0 free: 257292 MB  
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31  
node 1 size: 258010 MB  
node 1 free: 257639 MB  
node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47  
node 2 size: 258043 MB  
node 2 free: 257701 MB  
node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63  
node 3 size: 257816 MB  
node 3 free: 257467 MB  
node distances:  
   node   0   1   2   3  
   0:  10  11  20  20  
   1:  11  10  20  20  
   2:  20  20  10  11  
   3:  20  20  11  10

From /proc/meminfo  
   MemTotal:  1056276052 kB  
   HugePages_Total: 0  
   Hugepagesize:  2048 kB

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has  
powersave

From /etc/*release* /etc/*version*  
   os-release:  
      NAME="SLES"  
      VERSION="15-SP2"  
      VERSION_ID="15.2"  
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"  
      ID="sles"  
      ID_LIKE="suse"  
      ANSI_COLOR="0;32"  
      CPE_NAME="cpe:/o:suse:sles:15:sp2"

uname -a:  
   Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba) x86_64
**Platform Notes (Continued)**

x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

- **CVE-2018-12207** (iTLB Multihit): Not affected
- **CVE-2018-3620** (L1 Terminal Fault): Not affected
- Microarchitectural Data Sampling: Not affected
- **CVE-2017-5754** (Meltdown): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- **CVE-2018-3639** (Speculative Store Bypass): Mitigation: usercopy/swaps barriers and __user pointer sanitization
- **CVE-2017-5753** (Spectre variant 1):
- **CVE-2017-5715** (Spectre variant 2):
- **CVE-2020-0543** (Special Register Buffer Data Sampling): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
- **CVE-2019-11135** (TSX Asynchronous Abort): Not affected

run-level 3 Jun 5 07:41

SPEC is set to: /home/Benchmark/speccpu-1.1.8_ic21.1

```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      xfs   376G  159G  217G  43%  /home
```

From /sys/devices/virtual/dmi/id

```
Vendor:        FUJITSU
Product:       PRIMERGY RX2540 M6
Product Family: SERVER
Serial:         EWAAxxxxxx
```

Additional information from dmidecode 3.2 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 SMI BIOS" standard.

```
Memory:
32x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

BIOS:
  BIOS Vendor:   FUJITSU
  BIOS Version:  V1.0.0.0 R1.2.0 for D3891-A1x
  BIOS Date:     04/01/2021
  BIOS Revision: 1.2
  Firmware Revision: 3.20
```

(End of data from sysinfo program)
Fujitsu
PRIMERGY RX2540 M6, Intel Xeon Platinum 8362, 2.80GHz

SPECrate®2017_fp_base = 429
SPECrate®2017_fp_peak = Not Run

CPU2017 License: 19
Test Date: Jun-2021
Test Sponsor: Fujitsu
Tested by: Fujitsu
Hardware Availability: Aug-2021
Software Availability: Dec-2020

Compiler Version Notes

C
---
519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
---
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
---

C++
---
508.namd_r(base) 510.parest_r(base)
---
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
---

C++, C
---
511.povray_r(base) 526.blender_r(base)
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
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---

C++, C, Fortran
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507.cactuBSSN_r(base)
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Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
---

Fortran
---
503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
---
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
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Fujitsu
PRIMERGY RX2540 M6, Intel Xeon Platinum 8362, 2.80GHz

SPECrater®2017_fp_base = 429
SPECrater®2017_fp_peak = Not Run

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

Compiler Version Notes (Continued)

------------------------------------------------------------------------------
Fortran, C | 521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
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Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Benmarks using both Fortran and C:
ifort icx

Benmarks using both C and C++:
icpx icx

Benmarks using Fortran, C, and C++:
icpx icx ifort

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 -funsinged-char

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### Base Portability Flags (Continued)

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:**
- `-w`  
- `-std=c11`  
- `-m64`  
- `-Wl,-z,-m64,-Wl,-z,-muldefs -xCORE-AVX512 -Ofast -ffast-math`  
- `-flto`  
- `-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`  
- `-mbranches-within-32B-boundaries -ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`

**C++ benchmarks:**
- `-w`  
- `-m64`  
- `-Wl,-z,-m64,-Wl,-z,-muldefs -xCORE-AVX512 -Ofast -ffast-math`  
- `-flto`  
- `-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`  
- `-mbranches-within-32B-boundaries -ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`

**Fortran benchmarks:**
- `-w`  
- `-m64`  
- `-Wl,-z,-m64,-Wl,-z,-muldefs -xCORE-AVX512`  
- `-O3`  
- `-ipo`  
- `-qopt-prefetch -ffinite-math-only`  
- `-qopt-multiple-gather-scatter-by-shuffles -qopt-mem-layout-trans=4`  
- `-nostandard-realloc-lhs -align array32byte`  
- `-mbranches-within-32B-boundaries -ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`

**Benchmarks using both Fortran and C:**
- `-w`  
- `-m64`  
- `-std=c11`  
- `-Wl,-z,-m64,-Wl,-z,-muldefs -xCORE-AVX512 -Ofast -ffast-math`  
- `-flto`  
- `-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo`  
- `-no-prec-div -qopt-prefetch -ffinite-math-only`  
- `-qopt-multiple-gather-scatter-by-shuffles`  
- `-mbranches-within-32B-boundaries -nostandard-realloc-lhs`  
- `-align array32byte -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

**Benchmarks using both C and C++:**
- `-w`  
- `-m64`  
- `-std=c11`  
- `-Wl,-z,-m64,-Wl,-z,-muldefs -xCORE-AVX512 -Ofast -ffast-math`  
- `-flto`  
- `-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`  
- `-mbranches-within-32B-boundaries -ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`

**Benchmarks using Fortran, C, and C++:**
- `-w`  
- `-m64`  
- `-std=c11`  
- `-Wl,-z,-m64,-Wl,-z,-muldefs -xCORE-AVX512 -Ofast -ffast-math`
Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-align array32byte -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

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/Fujitsu-Platform-Settings-V1.0-ICL-RevA.xml
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml