### Fujitsu

**PRIMERGY RX2450 M1, AMD EPYC 7643**

**2.30 GHz**

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<tbody>
<tr>
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**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Oct-2021  
**Hardware Availability:** Oct-2021  
**Software Availability:** Mar-2021

#### Hardware

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#### Software

| OS: | SUSE Linux Enterprise Server 15 SP2 (x86_64)  
kernel version  
5.3.18-22-default |
|-----|-----------------------------------------------|
| Compiler: | C/C++/Fortran: Version 3.0.0 of AOCC  
Parallel: | No |
| Firmware: | Fujitsu BIOS Version 2.1.V2 Released Oct-2021  
File System: | xfs |
| System State: | Run level 3 (multi-user)  
Base Pointers: | 64-bit |
| Peak Pointers: | Not Applicable  
Other: | jemalloc: jemalloc memory allocator library v5.2.0 |
| Power Management: | BIOS set to prefer performance at the cost of additional power usage |

---

**CPU Name:** AMD EPYC 7643  
**Max MHz:** 3600  
**Nominal:** 2300  
**Enabled:** 96 cores, 2 chips, 2 threads/core  
**Orderable:** 2 chips  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**L2:** 512 KB I+D on chip per core  
**L3:** 256 MB I+D on chip per chip, 32 MB shared / 6 cores  
**Other:** None  
**Memory:** 2 TB (32 x 64 GB 2Rx4 PC4-3200V-L)  
**Storage:** 1 x PCIe SSD, 2TB  
**Other:** None
SPEC CPU®2017 Floating Point Rate Result

Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 7643
2.30 GHz

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

SPECrating®2017_fp_base = 546
SPECrating®2017_fp_peak = Not Run

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Compiler Notes

The AMD64 AOCC Compiler Suite is available at http://developer.amd.com/amd-aocc/

Submit Notes

The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.

Operating System Notes

'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -d 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.

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

Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 7643
2.30 GHz

| SPECrate®2017_fp_base = 546 |
| SPECrate®2017_fp_peak = Not Run |

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

Operating System Notes (Continued)

To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

To enable Transparent Hugepages (THP) for all allocations, 'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
    "/home/benchmark/speccpu-milan/amd_rate_aocc300_milan_B_lib/lib;/home/benchmark/speccpu-milan/amd_rate_aocc300_milan_B_lib/lib32:"
MALLOC_CONF = "retain:true"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using OpenSUSE 15.2

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.
jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
jemalloc 5.2.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.2.0/jemalloc-5.2.0.tar.bz2

Platform Notes

BIOS configuration:
ACPI SRAT L3 Cache As NUMA Domain = Enabled
APBDIS = 1
cTDP Control = Manual
cTDP = 240
Determinism Slider = Power
DRAM Scrub Time = Disabled
EDC Control = Manual
EDC = 300

(Continued on next page)
Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 7643
2.30 GHz

SPECraten®2017_fp_base = 546
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CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Test Date: Oct-2021
Hardware Availability: Oct-2021
Software Availability: Mar-2021

Platform Notes (Continued)

EDC Platform Limit = 300
Fix SOC P-state = P0
IOMMU = Disabled
L1 Stream HW Prefetcher = Enabled
L2 Stream HW Prefetcher = Enabled
NUMA Nodes Per Socket = NPS4
Package Power Limit = 240
Package Power Limit Control = Manual
SVM Mode = Disabled
SMT Control = Enabled
xGMI Link Max Speed = 18Gbps

Sysinfo program /home/benchmark/speccpu-milan/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on localhost Tue Aug 3 23:49:01 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 : AMD EPYC 7643 48-Core Processor
  2 "physical id"s (chips)
  192 "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 : 48
siblings : 96
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
  32 33 34 35 36 37 40 41 42 43 44 45 48 49 50 51 52 53 56 57 58 59 60 61
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
  32 33 34 35 36 37 40 41 42 43 44 45 48 49 50 51 52 53 56 57 58 59 60 61

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: 48 bits physical, 48 bits virtual
CPU(s): 192
On-line CPU(s) list: 0-191
Thread(s) per core: 2
Core(s) per socket: 48
Socket(s): 2
NUMA node(s): 16
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1

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

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Platform Notes (Continued)

Model name: AMD EPYC 7643 48-Core Processor
Stepping: 1
CPU MHz: 2849.575
CPU max MHz: 2300.0000
CPU min MHz: 1500.0000
BogoMIPS: 4600.42
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 32768K
NUMA node0 CPU(s): 0-5,96-101
NUMA node1 CPU(s): 6-11,102-107
NUMA node2 CPU(s): 12-17,108-113
NUMA node3 CPU(s): 18-23,114-119
NUMA node4 CPU(s): 24-29,120-125
NUMA node5 CPU(s): 30-35,126-131
NUMA node6 CPU(s): 36-41,132-137
NUMA node7 CPU(s): 42-47,138-143
NUMA node8 CPU(s): 48-53,144-149
NUMA node9 CPU(s): 54-59,150-155
NUMA node10 CPU(s): 60-65,156-161
NUMA node11 CPU(s): 66-71,162-167
NUMA node12 CPU(s): 72-77,168-173
NUMA node13 CPU(s): 78-83,174-179
NUMA node14 CPU(s): 84-89,180-185
NUMA node15 CPU(s): 90-95,186-191
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtsscp lm
constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq
monitor ssse3 fma cx16 pcid sse4_1 sse4_2 movbe popcnt aes x86_64 rdrand
lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osw
ibs skinit wdt tce topoext perfctr_core perfctr_nb pbeext perfctr_l1c mwaitx cpb
cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs i督办 stibp vmmcall fsgsbase
bmi1 avx2 smep bmi2 11ms invpcid cqm rdt_a rdseed adx smap clflushopt clwb sha_ni
xsavexopt xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local
cizer irperf xsaveerptr wbinvnr arat npt lbrv svm_lock nrrip save tsc_scale
vmbc_clean flushbyasid decodeassist pausefilter pthreshold v_vmsave_vmload vgif
umip pku ospke vaes vpclmulqdq rdpid overflow_recov succor smca

//proc/cpuinfo cache data
  cache size : 512 KB

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 16 nodes (0-15)
  node 0 cpus: 0 1 2 3 4 5 96 97 98 99 100 101

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

**Fujitsu**

PRIMERGY RX2450 M1, AMD EPYC 7643

2.30 GHz

---

**SPECrate®2017_fp_base = 546**

**SPECrate®2017_fp_peak = Not Run**

---

**CPU2017 License:** 19

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**Tested by:** Fujitsu

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<td>node 8 size: 129020 MB</td>
</tr>
<tr>
<td>node 8 free: 128868 MB</td>
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<tr>
<td>node 9 cpus: 54 55 56 57 58 59 150 151 152 153 154 155</td>
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<td>node 9 size: 129018 MB</td>
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<td>node 9 free: 128882 MB</td>
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<td>node 10 cpus: 60 61 62 63 64 65 156 157 158 159 160 161</td>
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<td>node 10 size: 129020 MB</td>
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<tr>
<td>node 10 free: 128883 MB</td>
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<tr>
<td>node 11 cpus: 66 67 68 69 70 71 162 163 164 165 166 167</td>
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<td>node 11 free: 128882 MB</td>
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<td>node 12 cpus: 72 73 74 75 76 77 168 169 170 171 172 173</td>
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<tr>
<td>node 13 cpus: 78 79 80 81 82 83 174 175 176 177 178 179</td>
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<td>node 13 size: 129018 MB</td>
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<td>node 13 free: 128883 MB</td>
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<tr>
<td>node 14 cpus: 84 85 86 87 88 89 180 181 182 183 184 185</td>
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<tr>
<td>node 14 size: 129020 MB</td>
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<td>node 14 free: 128886 MB</td>
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<tr>
<td>node 15 cpus: 90 91 92 93 94 95 186 187 188 189 190 191</td>
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<tr>
<td>node 15 size: 128778 MB</td>
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<tr>
<td>node 15 free: 128632 MB</td>
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(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 7643
2.30 GHz

SPECrater®2017_fp_base = 546
SPECrater®2017_fp_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Test Date: Oct-2021
Hardware Availability: Oct-2021
Tested by: Fujitsu
Software Availability: Mar-2021

Platform Notes (Continued)

node distances:

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</tr>
</tbody>
</table>

From /proc/meminfo
MemTotal: 2113294716 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

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/lp-1a956f1) x86_64 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

(Continued on next page)
Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 7643
2.30 GHz

SPECrates
SPECrate®2017_fp_base = 546
SPECrate®2017_fp_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu
Test Date: Oct-2021
Hardware Availability: Oct-2021
Software Availability: Mar-2021

Platform Notes (Continued)

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: usercopy/swapsgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):
Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: always-on, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Aug 3 23:47
SPEC is set to: /home/benchmark/speccpu-milan
Filesystem  Type  Size  Used Avail Use% Mounted on
/dev/nvme0n1p3  xfs  1.3T   46G  1.3T   4% /home

From /sys/devices/virtual/dmi/id
Vendor: FUJITSU
Product: PRIMERGY RX2450 M1
Serial: MACUxxxxxx

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 SMBIOS" standard.
Memory:
32x Samsung M393A8G40AB2-CWE 64 GB 2 rank 3200

BIOS:
BIOS Vendor: American Megatrends Inc.
BIOS Version: 2.1.V2
BIOS Date: 08/02/2021
BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| C   | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base) |
|-----------------------------------------------|
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
(Continued on next page)
### Fujitsu

PRIMERGY RX2450 M1, AMD EPYC 7643 2.30 GHz

<table>
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<th>CPU2017 License:</th>
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<td>Test Sponsor:</td>
<td>Fujitsu</td>
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<td>Tested by:</td>
<td>Fujitsu</td>
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<table>
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<th>SPECrate®2017_fp_base</th>
<th>546</th>
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<tbody>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>Not Run</td>
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</table>

**Compiler Version Notes (Continued)**

Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

<table>
<thead>
<tr>
<th>C++</th>
<th>508.namd_r(base) 510.parest_r(base)</th>
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</table>
| AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin |

<table>
<thead>
<tr>
<th>C++, C, Fortran</th>
<th>507.cactuBSSN_r(base)</th>
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| AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin |

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

Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 7643
2.30 GHz

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

SPECrater®2017 fp_peak = Not Run
SPECrater®2017 fp_base = 546

Test Date: Oct-2021
Hardware Availability: Oct-2021
Software Availability: Mar-2021

Compiler Version Notes (Continued)

InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Fortran         | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
-----------------|---------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

-----------------|--------------------------------------------------------------
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base)
-----------------|--------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using both C and C++:
clang++ clang

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

Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 7643
2.30 GHz

SPECratenot run

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

Test Date: Oct-2021
Hardware Availability: Oct-2021
Software Availability: Mar-2021

Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
clang++ clang flang

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.ibm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
526.blender_r: -funsigned-char -D__BOOL_DEFINED -DSPEC_LP64
527.cam4_r: -DSPEC_CASE_FLAG -DSPEC_LP64
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:
-m64 -flto -W1,-mllvm -W1,-region-vectorize
-W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -z muldefs
-lamdlibm -ljemalloc -flang -lflangrti

C++ benchmarks:
-m64 -std=c+++98 -mno-adx -mno-sse4a
-W1,-mllvm -W1,-x86-use-vzeroupper=false -flto
-W1,-mllvm -W1,-region-vectorize -W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -mllvm -enable-partial-unswitch
-mllvm -unroll-threshold=100 -finline-aggressive
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000

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

C++ benchmarks (continued):
-  -mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-  -mllvm -extra-vectorizer-passes -mllvm -reduce-array-computations=3
-  -mllvm -global-vectorize-slp=true -mllvm -convert-pow-exp-to-int=false
-  -z muldefs -lamlbim -ljemalloc -lflang -lflangrti

Fortran benchmarks:
-  -m64 -Wl,-mllvm -Wl,-enable-X86-prefetching
-  -Wl,-mllvm -Wl,-enable-licm-vrp -flio -Wl,-mllvm -Wl,-region-vectorize
-  -Wl,-mllvm -Wl,-function-specialize
-  -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-  -Wl,-mllvm -Wl,-reduce-array-computations=3 -Hz,1,0x1 -O3 -ffast-math
-  -march=znver3 -fvecclib=AMDLIBM -Kieee -Mrecursive
-  -mllvm -fuse-tile-inner-loop -funroll-loops
-  -mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop
-  -mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-  -mllvm -global-vectorize-slp=true -z muldefs -lamlbim -ljemalloc
-  -lflang -lflangrti

Benchmarks using both Fortran and C:
-  -m64 -Wl,-mllvm -Wl,-enable-X86-prefetching
-  -Wl,-mllvm -Wl,-enable-licm-vrp -flio -Wl,-mllvm -Wl,-region-vectorize
-  -Wl,-mllvm -Wl,-function-specialize
-  -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-  -Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-  -march=znver3 -fvecclib=AMDLIBM -fstruct-layout=5
-  -mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-  -fremap-arrays -mllvm -function-specialize -fiv-function-specialization
-  -mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-  -mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -Hz,1,0x1
-  -Kieee -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
-  -mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop -z muldefs
-  -lamlbim -ljemalloc -lflang -lflangrti

Benchmarks using both C and C++:
-  -m64 -std=c++98 -mno-adx -mno-sse4a
-  -Wl,-mllvm -Wl,-x86-use-vzeroupper=false -flio
-  -Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize
-  -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-  -Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-  -march=znver3 -fvecclib=AMDLIBM -fstruct-layout=5
-  -mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-  -fremap-arrays -mllvm -function-specialize -fiv-function-specialization
-  -mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-  -mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-  -mllvm -enable-partial-unswitch -mllvm -unroll-threshold=100

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

Benchmarks using both C and C++ (continued):
-ffinline-aggressive -mllvm -loop-unswitch-threshold=200000
-mlir -reroll-loops -mllvm -aggressive-loop-unswitch
-mlir -extra-vectorizer-passes -mllvm -convert-pow-exp-to-int=false
-z muldefs -lamdlibm -ljemalloc -lflag -lflangrti

Benchmarks using Fortran, C, and C++:
-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mlir -Wl,-x86-use-vzeroupper=false -flto
-Wl,-mlir -Wl,-region-vectorize -Wl,-mlir -Wl,-function-specialize
-Wl,-mlir -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlir -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znerver3 -fveclib=AMDLIBM -fstruct-layout=5
-mlir -unroll-threshold=50 -mlir -inline-threshold=1000
-fremap-arrays -mllvm -function-specialize -flv-function-specialization
-mlir -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mlir -enable-lcm-vrp -mlir -reduce-array-computations=3
-mlir -enable-partial-unswitch -mlir -unroll-threshold=100
-ffinline-aggressive -mlir -loop-unswitch-threshold=200000
-mlir -reroll-loops -mlir -aggressive-loop-unswitch
-mlir -extra-vectorizer-passes -mllvm -convert-pow-exp-to-int=false
-Hz,1,0x1 -Kieee -Mrecursive -mlir -fuse-tile-inner-loop
-funroll-loops -mlir -lrs-in-nested-loop -z muldefs -lamdlibm
-ljemalloc -lflag -lflangrti

Base Other Flags

C benchmarks:
-Wno-unused-command-line-argument

C++ benchmarks:
-Wno-unused-command-line-argument

Fortran benchmarks:
-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:
-Wno-unused-command-line-argument

Benchmarks using both C and C++:
-Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:
-Wno-unused-command-line-argument
## SPEC CPU®2017 Floating Point Rate Result

**Fujitsu**

PRIMERGY RX2450 M1, AMD EPYC 7643

2.30 GHz

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<th>SPECrate®2017_fp_base =</th>
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<td>SPECrate®2017_fp_peak =</td>
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### Benchmarks

- Test Date: Oct-2021
- Hardware Availability: Oct-2021
- Software Availability: Mar-2021

### Details

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

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 CPU®2017 v1.1.8 on 2021-08-03 10:49:01-0400.
Originally published on 2021-11-23.