Fujitsu
PRIMERGY RX2450 M2,
AMD EPYC 9274F, 4.05 GHz

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

Test Date: Mar-2024
Hardware Availability: Feb-2024
Software Availability: Nov-2022

SPECrate®2017_int_base = 631
SPECrate®2017_int_peak = Not Run

500.perlbench_r 96
502.gcc_r 96
505.mcf_r 96
520.omnetpp_r 96
523.xalanchmk_r 96
525.x264_r 96
531.deepsjeng_r 96
541.leela_r 96
548.exchange2_r 96
557.xz_r 96

--- SPECrate®2017_int_base (631) ---

Copies
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500

Hardware
CPU Name: AMD EPYC 9274F
Max MHz: 4300
Nominal: 4050
Enabled: 32 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: 256 MB I+D on chip per chip,
32 MB shared / 3 cores
Other: None
Memory: 768 GB (24 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x PCIE NVME SSD, 2 TB
Other: Cooling: Air

Software
OS: SUSE Linux Enterprise Server 15 SP4
5.14.21-150400.22-default
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: Fujitsu BIOS Version Version V5.0.0.27 R1.5.0 for D4129-A1x. Released May-2024
tested as V5.0.0.27 R1.4.0 for D4129-A1x Jan-2024
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 Integer Rate Result**

**Fujitsu**
PRIMERGY RX2450 M2, AMD EPYC 9274F, 4.05 GHz

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tr>
<td>500.perlbench_r</td>
<td>96</td>
<td>338</td>
<td>452</td>
<td>338</td>
<td>453</td>
<td>339</td>
<td>451</td>
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<tr>
<td>502.gcc_r</td>
<td>96</td>
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<td>552</td>
<td>247</td>
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<td>172</td>
<td>900</td>
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<td>114</td>
<td>1470</td>
<td>114</td>
<td>1480</td>
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<tr>
<td>531.deepsjeng_r</td>
<td>96</td>
<td>220</td>
<td>500</td>
<td>220</td>
<td>501</td>
<td>220</td>
<td>501</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>96</td>
<td>328</td>
<td>484</td>
<td>328</td>
<td>485</td>
<td>328</td>
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<td>548.exchange2_r</td>
<td>96</td>
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<td>1420</td>
<td>177</td>
<td>1420</td>
<td>179</td>
<td>1400</td>
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<tr>
<td>557.xz_r</td>
<td>96</td>
<td>333</td>
<td>312</td>
<td>334</td>
<td>310</td>
<td>336</td>
<td>309</td>
</tr>
</tbody>
</table>

**Results Table**

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

**Compiler Notes**


**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 -l 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.
To clear filesystem caches, 'sync; sysctl -w vm.swappiness=1' 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) only on request for base runs, 'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
SPEC CPU®2017 Integer Rate Result
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Environment Variables Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017r/amd_rate_occc400_znver4_A_lib/lib:/home/Benchmark/speccpu2017r/amd_rate_occc400_znver4_A_lib/lib32:"
MALLOC_CONF = "retain:true"

General Notes
Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6
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:
Determinism Slider = Power
TDP Control = Manual
TDP Limit = 400
Package Power Limit Control = Manual
Package Power Limit = 400
DF PState Frequency Optimizer = Enabled
Power Profile Selection = High Performance
NUMA nodes per socket = NPS4
Chipselect Interleaving = Enabled
Probe Filter Organization = Shared
Periodic Directory Rinse (PDR) Tuning = Cache-Bound
Fan Control = Full

Sysinfo program /home/Benchmark/speccpu2017r/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c6ae2c92cc097bec197
running on localhost Fri Mar  8 21:40:35 2024

SUT (System Under Test) info as seen by some common utilities.

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----------------------------------------------------------------------------------------------
1. uname -a
2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. lscpu
8. numacl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline

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Platform Notes (Continued)

14. cpupower frequency-info
15. sysctl
16. /sys/kernel/mm/transparent_hugepage
17. /sys/kernel/mm/transparent_hugepage/khugepaged
18. OS release
19. Disk information
20. /sys/devices/virtual/dmi/id
21. dmidecode
22. BIOS

------------------------------------------------------------
1. uname -a
Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
x86_64 x86_64 x86_64 GNU/Linux

------------------------------------------------------------
2. w
21:40:35 up 26 min, 1 user, load average: 0.00, 0.00, 0.00
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
root     tty1     -                21:39   11.00s  1.16s  0.11s /bin/bash ./amd_rate_aocc400_znver4_A1.sh

------------------------------------------------------------
3. Username
From environment variable $USER: root

------------------------------------------------------------
4. ulimit -a
  core file size          (blocks, -c) unlimited
  data seg size           (kbytes, -d) unlimited
  scheduling priority             (-e) 0
  file size               (blocks, -f) unlimited
  pending signals                 (-i) 3092326
  max locked memory       (kbytes, -l) 2097152
  max memory size         (kbytes, -m) unlimited
  open files                      (-n) 65536
  pipe size            (512 bytes, -p) 8
  POSIX message queues     (bytes, -q) 819200
  real-time priority              (-r) 0
  stack size              (kbytes, -s) unlimited
  cpu time               (seconds, -t) unlimited
  max user processes              (-u) 3092326
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited

------------------------------------------------------------
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 30
login -- root
-bash
-bash
python3 ./run_amd_intrate_aocc400_znver4_A1.py
/bin/bash ./amd_rate_aocc400_znver4_A1.sh
runcpu --config amd_rate_aocc400_znver4_A1.cfg --tune base --reportable --iterations 3 intrate
runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune base --reportable --iterations 3 --nopower
--runmode rate --tune base --size test:train:refrate intrate --nopreenv --note-preenv --logfile
SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu
specperl $SPEC/bin/sysinfo
$SPEC = /home/Benchmark/speccpu2017r

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Platform Notes (Continued)

6. /proc/cpuinfo
   model name      : AMD EPYC 9274F 24-Core Processor
   vendor_id       : AuthenticAMD
   cpu family      : 25
   model           : 17
   stepping        : 1
   microcode       : 0xa101144
   bugs            : sysret_ss_athrs spectre_v1 spectre_v2 spec_store_bypass
   TLB size        : 3584 4K pages
   cpu cores       : 24
   siblings        : 48
   2 physical ids (chips)
   96 processors (hardware threads)
   physical id 0: core ids 0-2,8-10,16-18,24-26,32-34,40-42,48-50,56-58
   physical id 1: core ids 0-2,8-10,16-18,24-26,32-34,40-42,48-50,56-58
   physical id 0: apicids 0-5,16-21,32-37,48-53,64-69,80-85,96-101,112-117
   physical id 1: apicids 128-133,144-149,160-165,176-181,192-197,208-213,224-229,240-245
Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

7. lscpu
From lscpu from util-linux 2.37.2:
Architectures:                x86_64
CPU op-mode(s):               32-bit, 64-bit
Address sizes:               52 bits physical, 57 bits virtual
Byte Order:                  Little Endian
CPU(s):                      96
On-line CPU(s) list:         0-95
Vendor ID:                   AuthenticAMD
Model name:                  AMD EPYC 9274F 24-Core Processor
CPU family:                  25
Model:                       17
Thread(s) per core:          2
Core(s) per socket:          24
Socket(s):                   2
Stepping:                    1
Frequency boost:             enabled
CPU max MHz:                 4303.1250
CPU min MHz:                 1500.0000
BogoMIPS:                    8088.24
Flags:                      fpu vme de pse tsc msr pae mca cmov pat pse36
                           clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm
                           constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf rpl
                           pni pclmulqdq monitor ssse3 fma cx16 pdcm aclmmr pst cce dpl犹如 cs llcd flush
                           avx f16c rdrand popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extatic cr8 Legacy
                           ahm ssse4a misalignsse 3dnowprefetch osxv ibs skinit wdt tce topoext perfctr core perfctr_nb
                           bptext perfctr llc mwaitx cpub core cat_1 cdp_13
                           invpcid_single hw_pstate sbbm mda ibrs ibpb stibp vmmcall fagsbase bm1
                           avx2 smep bm12 erms invpcid cmrr_tdt_avx512df avx512dq rdseed adx smap
                           avx512ifma clflushopt clwb avx512cd sha ni avx512bw avx512v l xsaveopt
                           xsavec xgetbv1 xsaves cmrr llc cmrr_mmm_total cmrr_mmm_local
                           avx512_bf16 clzero iperf xsaveopt rdrpu wboinvd amd_pip arat npt lbv
                           svm_lock nrip_save tscf_scale vmcb_clean flushbyasid decodeassist
                           pausefilter pfthreshold avic v_mmio_vmlkload qgif v_spec_ctl avx512v bmi
                           umip pku ospe avx512_vbdmi2 gfni vqpcmuqcd avx512_vnsi avx512_bitalg
                           avx512_vpopcntd7 lq57 rdpid overflow_recov sucor smca fsrm flush_l1d
                           AMD-V
Virtualization:             (Continued on next page)
## Fujitsu

### Platform Notes (Continued)

| L1d cache: | 1.5 MiB (48 instances) |
| L1i cache: | 1.5 MiB (48 instances) |
| L2 cache:  | 48 MiB (48 instances)  |
| L3 cache:  | 512 MiB (16 instances) |
| NUMA node(s): | 8 |
| NUMA node0 CPU(s): | 0-5, 48-53 |
| NUMA node1 CPU(s): | 6-11, 54-59 |
| NUMA node2 CPU(s): | 12-17, 60-65 |
| NUMA node3 CPU(s): | 18-23, 66-71 |
| NUMA node4 CPU(s): | 24-29, 72-77 |
| NUMA node5 CPU(s): | 30-35, 78-83 |
| NUMA node6 CPU(s): | 36-41, 84-89 |
| NUMA node7 CPU(s): | 42-47, 90-95 |

**Vulnerability Itlb multihit:** Not affected

**Vulnerability Itlf:** Not affected

**Vulnerability Mds:** Not affected

**Vulnerability Meltdown:** Not affected

**Vulnerability Spec store bypass:** Mitigation; Speculative Store Bypass disabled via prctl and seccomp

**Vulnerability Spectre v1:** Mitigation; usercopy/swapgs barriers and __user pointer sanitation

**Vulnerability Spectre v2:** Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, RSB filling

**Vulnerability Srbds:** Not affected

**Vulnerability Tax async abort:** Not affected

From `lscpu --cache`:

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1d</td>
<td>32K</td>
<td>1.5M</td>
<td>8</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>1.5M</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2</td>
<td>1M</td>
<td>48M</td>
<td>8</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3</td>
<td>32M</td>
<td>512M</td>
<td>16</td>
<td>Unified</td>
<td>3</td>
<td>32768</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

---

8. `numactl --hardware`

**NOTE:** A `numactl 'node'` might or might not correspond to a physical chip.

---

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

node  0  1  2  3  4  5  6  7
  0:  10  12  12  12  32  32  32  32
  1:  12  10  12  12  32  32  32  32
  2:  12  12  10  12  32  32  32  32
  3:  12  12  12  10  32  32  32  32
  4:  32  32  32  32  10  12  12  12
  5:  32  32  32  32  12  10  12  12
  6:  32  32  32  32  12  12  10  12
  7:  32  32  32  32  12  12  12  10

9. /proc/meminfo
   MemTotal:       791660488 kB

10. who -r
    run-level 3 Mar 8 21:16

11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
    Default Target  Status
    multi-user      running

12. Services, from systemctl list-unit-files
    STATE            UNIT FILES
    enabled          YaST2-Firstboot YaST2-Second-Stage apparmor auditd bluetooth cron display-manager getty@ haviged irqbalance iscsi issue-generator kbdssettings kdump kdump-early klog lvm2-monitor nscd nvmefc-boot-connections postfix purge-kernels rollback rsyslog smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
    enabled-runtime  systemd-remount-fs
    indirect         wicked

13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
    root=UUID=fc0a5636-eee2-42c1-a98a-4213e704cc89
    splash=silent
    mitigations=auto
    quiet
    security=apparmor
    crashkernel=328M,high
    crashkernel=72M,low

14. cpupower frequency-info
    analyzing CPU 0:
    current policy: frequency should be within 1.50 GHz and 4.05 GHz.
    The governor "ondemand" may decide which speed to use
    within this range.
    boost state support:
    (Continued on next page)
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<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>19</th>
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<tbody>
<tr>
<td>Test Date:</td>
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<tr>
<td>Test Sponsor:</td>
<td>Fujitsu</td>
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<td>Fujitsu</td>
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<td>Hardware Availability:</td>
<td>Feb-2024</td>
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<tr>
<td>Software Availability:</td>
<td>Nov-2022</td>
</tr>
</tbody>
</table>

### SPECrate®2017_int_base = 631

### SPECrate®2017_int_peak = Not Run

---

**Platform Notes (Continued)**

Supported: yes  
Active: yes

```plaintext
15. sysctl
   kernel.numa_balancing               1
   kernel.randomize_va_space           0
   vm.compartment_proactiveness        20
   vm.dirty_background_bytes           0
   vm.dirty_background_ratio           10
   vm.dirty_bytes                      0
   vm.dirty_expire_centiseconds        3000
   vm.dirty_ratio                      8
   vm.dirty_writeback_centiseconds     500
   vm.dirtytime_expire_seconds        43200
   vmextrême_threshold                500
   vm.min_unmapped_ratio               1
   vm.nr_hugepages                     0
   vm.nr_hugepages_mempolicy           0
   vm.nr_overcommit_hugepages          0
   vm.swappiness                       1
   vm.watermark_boost_factor           15000
   vm.watermark_scale_factor           10
   vm.zone_reclaim_mode               1
```

```plaintext
16. /sys/kernel/mm/transparent_hugepage
   defrag          [always] defer defer+madvise madvise never
   enabled         [always] madvise never
   hpage_pmd_size  2097152
   shmem_enabled   always within_size advise [never] deny force
```

```plaintext
17. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs   60000
   defrag                  1
   max_ptes_none           511
   max_ptes_shared         256
   max_ptes_swap           64
   pages_to_scan           4096
   scan_sleep_millisecs    10000
```

### OS release

From /etc/*-release /etc/*-version

os-release SUSE Linux Enterprise Server 15 SP4

---

19. Disk information

SPEC is set to: /home/Benchmark/speccpu2017r

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/nvme0n1p2</td>
<td>xfs</td>
<td>1.9T</td>
<td>100G</td>
<td>1.8T</td>
<td>6%</td>
<td>/</td>
</tr>
</tbody>
</table>

---

20. /sys/devices/virtual/dmi/id

<table>
<thead>
<tr>
<th>Vendor:</th>
<th>FUJITSU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product:</td>
<td>PRIMERGY RX2450 M2</td>
</tr>
<tr>
<td>Product Family:</td>
<td>SERVER</td>
</tr>
<tr>
<td>Serial:</td>
<td>xxxxxxxxxx</td>
</tr>
</tbody>
</table>

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Platform Notes (Continued)

21. dmidecode
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 SMIBOS" standard.
Memory:
24x Samsung M321R4GA3BB6-CQKEG 32 GB 2 rank 4800

Compiler Version Notes

C             | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)
---------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

C++           | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)
---------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

Fortran       | 548.exchange2_r(base)
---------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

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

Fujitsu
PRIMERGY RX2450 M2,
AMD EPYC 9274F, 4.05 GHz

<table>
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<td>Test Sponsor:</td>
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<td>Tested by:</td>
<td>Fujitsu</td>
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<tr>
<td>Test Date:</td>
<td>Mar-2024</td>
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<tr>
<td>Hardware Availability:</td>
<td>Feb-2024</td>
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<td>Software Availability:</td>
<td>Nov-2022</td>
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SPECr®2017_int_base = 631
SPECr®2017_int_peak = Not Run

Base Compiler Invocation (Continued)

Fortran benchmarks:
flang

Base Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
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:
-m64 -flto -W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3
-W1,-mllvm -W1,-ldist-scalar-expand -fenable-aggressive-gather
-z muldefs -03 -march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc

C++ benchmarks:
-m64 -flto -W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3 -z muldefs -03
-march=znver4 -fveclib=AMDLIBM -ffast-math
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden -lamdlibm -lflang
-lamdalloc-ext

Fortran benchmarks:
-m64 -flto -W1,-mllvm -W1,-align-all-nofallthru-blocks=6

(Continued on next page)
# SPEC CPU®2017 Integer Rate Result

## Fujitsu
**PRIMERGY RX2450 M2, AMD EPYC 9274F, 4.05 GHz**

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### Base Optimization Flags (Continued)

Fortran benchmarks (continued):
- -Wl,-mlllvm -Wl,-reduce-array-computations=3
- -Wl,-mlllvm -Wl,-inline-recursion=4 -Wl,-mlllvm -Wl,-lsr-in-nested-loop
- -Wl,-mlllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver4
- fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of- inductions
- mlllvm -optimize-strided-mem-cost -floop-transform
- mlllvm -unroll-aggressive -mlllvm -unroll-threshold=500 -lamdlibm
- -flang -lamdalloc

### Base Other Flags

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

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

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

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 v1.1.9 on 2024-03-08 07:40:35-0500.
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