SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMERGY RX2450 M2,
AMD EPYC 9655, 2.60 GHz

$SPECrate®2017\_int\_base =$ 1990

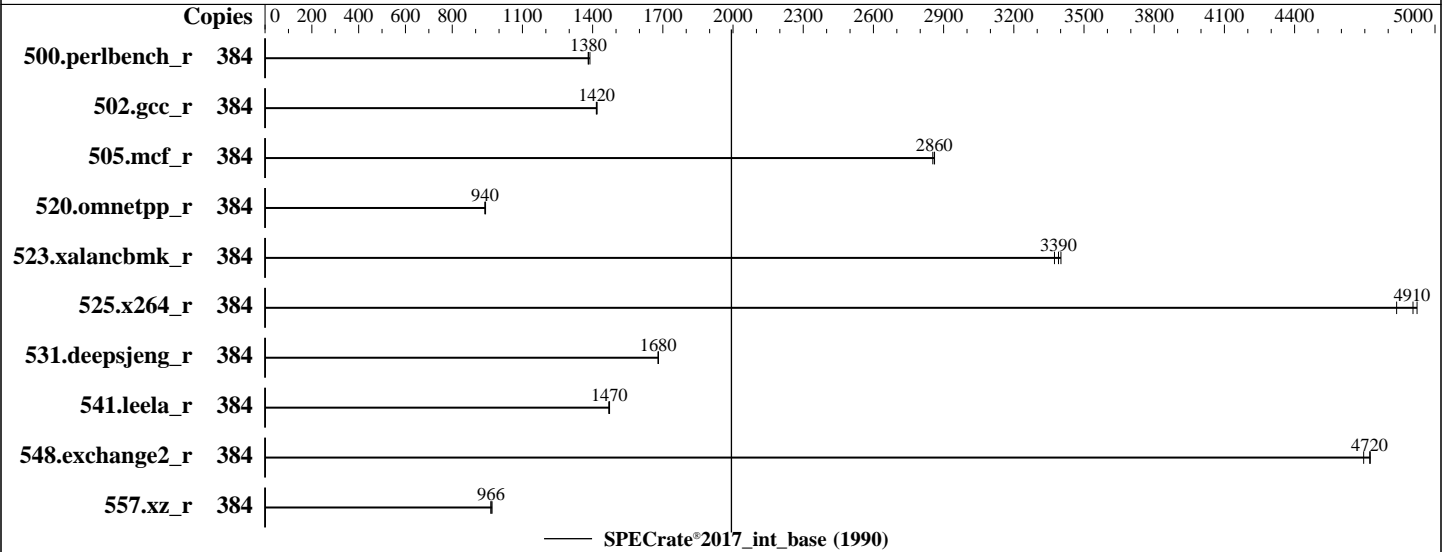$SPECrate®2017\_int\_peak =$ Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Nov-2024

Hardware Availability: Jan-2025

Software Availability: Sep-2024

Copies		
500.perlbench_r	384	1380
502.gcc_r	384	1420
505.mcf_r	384	2860
520.omnetpp_r	384	940
523.xalancbmk_r	384	3390
525.x264_r	384	4910
531.deepsjeng_r	384	1680
541.leela_r	384	1470
548.exchange2_r	384	4720
557.xz_r	384	966

SPECrate®2017_int_base (1990)

Hardware

CPU Name: AMD EPYC 9655
 Max MHz: 4500
 Nominal: 2600
Enabled: 192 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 384 MB I+D on chip per chip, 32 MB shared / 8 cores
 Other: None
Memory: 768 GB (24 x 32 GB 2Rx8 PC5-6400B-R, running at 6000)
Storage: 1 x PCIE NVME SSD, 2 TB
Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP6 kernel version 6.4.0-150600.21-default
Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
Parallel: No
Firmware: Fujitsu BIOS Version V5.0.0.35 R2.2.0 for D4129-A1x. Released Jan-2025 tested as V5.0.0.35 R9.90.0 for D4129-A1x Sep-2024
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of aditional power usage

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	384	440	1390	443	1380	**442**	**1380**							
502.gcc_r	384	383	1420	384	1420	**384**	**1420**							
505.mcf_r	384	217	2850	217	2860	**217**	**2860**							
520.omnetpp_r	384	535	942	536	940	**536**	**940**							
523.xalancbmk_r	384	119	3400	120	3370	**120**	**3390**							
525.x264_r	384	139	4840	**137**	**4910**	137	4920							
531.deepsjeng_r	384	262	1680	262	1680	**262**	**1680**							
541.leela_r	384	432	1470	**432**	**1470**	433	1470							
548.exchange2_r	384	**213**	**4720**	213	4720	214	4700							
557.xz_r	384	427	970	430	965	**429**	**966**							
SPECrate®2017_int_base =		**1990**												
SPECrate®2017_int_peak =		**Not Run**												

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

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 -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.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/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
```

Standard Performance Evaluation Corporation (info@spec.org)
https://www.spec.org/

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Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
    "/home/Benchmark/speccpu2017r-Turin/amd_rate_aocc500_znver5_A_lib/lib:/home/Benchmark/speccpu2017r-Tur
    in/amd_rate_aocc500_znver5_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
Power Profile Selection = High Performance
NUMA nodes per socket = NPS4
Probe Filter Organization = Shared
Interleaving Region Size = 2K Region Size
FAN Control = Full


 Sysinfo program /home/Benchmark/speccpu2017r-Turin/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Fri Nov  8 02:20:58 2024

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

 -----------------------------------------------------------
 Table of contents
 -----------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. sysctl
```

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Platform Notes (Continued)

```
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 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09)
  x86_64 x86_64 x86_64 GNU/Linux


-------------------------------------------------------------
2. w
  02:20:58 up  2:48,  1 user,  load average: 233.62, 343.08, 364.28
  USER     TTY       FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1      -               23:35    2:44m  0.97s  0.16s /bin/bash ./amd_rate_aocc500_znver5_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) 3089997
  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) 3089997
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited


-------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize=42
 login -- root
 -bash
 python3 ./run_amd_intrate_aocc500_znver5_A1_3l.py
 /bin/bash ./amd_rate_aocc500_znver5_A1.sh
 runcpu --config amd_rate_aocc500_znver5_A1.cfg --tune base --reportable --iterations 3 intrate
 runcpu --configfile amd_rate_aocc500_znver5_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 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/Benchmark/speccpu2017r-Turin


-------------------------------------------------------------
6. /proc/cpuinfo
    model name      : AMD EPYC 9655 96-Core Processor
```

(Continued on next page)

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Platform Notes (Continued)

```
     vendor_id       : AuthenticAMD
     cpu family      : 26
     model           : 2
     stepping        : 1
     microcode       : 0xb002116
     bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
     TLB size        : 192 4K pages
     cpu cores       : 96
     siblings        : 192
     2 physical ids (chips)
     384 processors (hardware threads)
     physical id 0: core ids 0-95
     physical id 1: core ids 0-95
     physical id 0: apicids 0-191
     physical id 1: apicids 256-447
  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 2.39.3:
   Architecture:              x86_64
   CPU op-mode(s):            32-bit, 64-bit
   Address sizes:             52 bits physical, 57 bits virtual
   Byte Order:                Little Endian
   CPU(s):                    384
   On-line CPU(s) list:       0-383
   Vendor ID:                 AuthenticAMD
   BIOS Vendor ID:            Advanced Micro Devices, Inc.
   Model name:                AMD EPYC 9655 96-Core Processor
   BIOS Model name:           AMD EPYC 9655 96-Core Processor           Unknown CPU @ 2.6GHz
   BIOS CPU family:           107
   CPU family:                26
   Model:                     2
   Thread(s) per core:        2
   Core(s) per socket:        96
   Socket(s):                 2
   Stepping:                  1
   Frequency boost:           enabled
   CPU(s) scaling MHz:        58%
   CPU max MHz:               4509.3750
   CPU min MHz:               1500.0000
   BogoMIPS:                  5192.45
   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
                              rdtscp lm constant_tsc rep_good amd_lbr_v2 nopl nonstop_tsc cpuid
                              extd_apicid aperfmperf rapl pni pclmulqdq monitor ssse3 fma cx16 pcid
                              sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm
                              cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
                              osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext
                              perfctr_llc mwaitx cpb cat_l3 cdp_l3 hw_pstate ssbd mba perfmon_v2
                              ibrs ibpb stibp ibrs_enhanced vmmcall fsgsbase tsc_adjust bmi1 avx2
                              smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
                              avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
                              xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
                              cqm_mbm_local user_shstk avx_vnni avx512_bf16 clzero irperf
                              xsaveerptr rdpru wbnoinvd amd_ppin cppc arat npt lbrv svm_lock
                              nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
                              pfthreshold avic v_vmsave_vmload vgif x2avic v_spec_ctrl vnmi
```

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Platform Notes (Continued)

```
                          avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq
                          avx512_vnni avx512_bitalg avx512_vpopcntdq la57 rdpid bus_lock_detect
                          movdiri movdir64b overflow_recov succor smca fsrm avx512_vp2intersect
                          flush_l1d debug_swap
    Virtualization:                      AMD-V
    L1d cache:                           9 MiB (192 instances)
    L1i cache:                           6 MiB (192 instances)
    L2 cache:                            192 MiB (192 instances)
    L3 cache:                            768 MiB (24 instances)
    NUMA node(s):                        8
    NUMA node0 CPU(s):                   0-23,192-215
    NUMA node1 CPU(s):                   24-47,216-239
    NUMA node2 CPU(s):                   48-71,240-263
    NUMA node3 CPU(s):                   72-95,264-287
    NUMA node4 CPU(s):                   96-119,288-311
    NUMA node5 CPU(s):                   120-143,312-335
    NUMA node6 CPU(s):                   144-167,336-359
    NUMA node7 CPU(s):                   168-191,360-383
    Vulnerability Gather data sampling:  Not affected
    Vulnerability Itlb multihit:         Not affected
    Vulnerability L1tf:                  Not affected
    Vulnerability Mds:                   Not affected
    Vulnerability Meltdown:              Not affected
    Vulnerability Mmio stale data:       Not affected
    Vulnerability Reg file data sampling: Not affected
    Vulnerability Retbleed:              Not affected
    Vulnerability Spec rstack overflow:  Not affected
    Vulnerability Spec store bypass:     Mitigation; Speculative Store Bypass disabled via prctl
    Vulnerability Spectre v1:            Mitigation; usercopy/swapgs barriers and __user pointer sanitization
    Vulnerability Spectre v2:            Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP
                                         always-on; RSB filling; PBRSB-eIBRS Not affected; BHI Not affected
    Vulnerability Srbds:                 Not affected
    Vulnerability Tsx async abort:       Not affected

  From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL  SETS PHY-LINE COHERENCY-SIZE
      L1d      48K       9M  12 Data               1    64        1             64
      L1i      32K       6M   8 Instruction        1    64        1             64
      L2        1M     192M  16 Unified            2  1024        1             64
      L3       32M     768M  16 Unified            3 32768        1             64

    -----------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 8 nodes (0-7)
    node 0 cpus: 0-23,192-215
    node 0 size: 95805 MB
    node 0 free: 94787 MB
    node 1 cpus: 24-47,216-239
    node 1 size: 96716 MB
    node 1 free: 95784 MB
    node 2 cpus: 48-71,240-263
    node 2 size: 96755 MB
    node 2 free: 95791 MB
    node 3 cpus: 72-95,264-287
    node 3 size: 96755 MB
    node 3 free: 95855 MB
    node 4 cpus: 96-119,288-311
    node 4 size: 96755 MB
    node 4 free: 95223 MB
```

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Platform Notes (Continued)

```
   node 5 cpus: 120-143,312-335
   node 5 size: 96755 MB
   node 5 free: 95788 MB
   node 6 cpus: 144-167,336-359
   node 6 size: 96755 MB
   node 6 free: 95828 MB
   node 7 cpus: 168-191,360-383
   node 7 size: 96225 MB
   node 7 free: 95269 MB
   node distances:
   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:       791066168 kB


   ------------------------------------------------------------
10. who -r
   run-level 3 Nov 7 23:35


   ------------------------------------------------------------
11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)
   Default Target  Status
   multi-user      running


   ------------------------------------------------------------
12. Services, from systemctl list-unit-files
   STATE             UNIT FILES
   enabled           YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager getty@ irqbalance
                     iscsi issue-generator kbdsettings kdump kdump-early kdump-notify klog lvm2-monitor nscd
                     nvmefc-boot-connections nvmf-autoconnect postfix purge-kernels rollback rsyslog smartd
                     sshd systemd-pstore virtqemud wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6
                     wickedd-nanny
   enabled-runtime   systemd-remount-fs
   disabled          autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                     chronyd console-getty cups cups-browsed debug-shell dnsmasq ebtables exchange-bmc-os-info
                     firewalld fsidd gpm grub2-once haveged hwloc-dump-hwdata ipmi ipmievd iscsi-init iscsid
                     issue-add-ssh-keys kexec-load ksm kvm_stat libvirt-guests lunmask man-db-create multipathd
                     nfs nfs-blkmap nfs-server nfsserver rpcbind rpmconfigcheck rsyncd serial-getty@
                     smartd_generate_opts snmpd snmptrapd strongswan strongswan-starter svnserve
                     systemd-boot-check-no-failures systemd-confext systemd-network-generator systemd-nspawn@
                     systemd-sysext systemd-time-wait-sync systemd-timesyncd tcsd udisks2 virtinterfaced
                     virtlockd virtlogd virtnetworkd virtnodedevd virtnwfilterd virtsecretd virtstoraged
                     vncserver@
   indirect          pcscd systemd-userdbd tftp wickedd


   ------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
   root=UUID=a6c544d9-3d7a-4bdf-8043-c3b78e6baa7c
   splash=silent
   resume=/dev/disk/by-uuid/49e80ffc-369d-4d77-944b-a98cd169ce13
```

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Platform Notes (Continued)

```
     mitigations=auto
     quiet
     security=apparmor
     crashkernel=384M,high
     crashkernel=72M,low


   ----------------------------------------------------------
   14. cpupower frequency-info
     analyzing CPU 122:
       current policy: frequency should be within 1.50 GHz and 2.60 GHz.
                       The governor "performance" may decide which speed to use
                       within this range.
       boost state support:
         Supported: yes
         Active: yes


   ----------------------------------------------------------
   15. sysctl
     kernel.numa_balancing             1
     kernel.randomize_va_space         0
     vm.compaction_proactiveness      20
     vm.dirty_background_bytes         0
     vm.dirty_background_ratio        10
     vm.dirty_bytes                    0
     vm.dirty_expire_centisecs      3000
     vm.dirty_ratio                    8
     vm.dirty_writeback_centisecs    500
     vm.dirtytime_expire_seconds   43200
     vm.extfrag_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


   ----------------------------------------------------------
   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


   ----------------------------------------------------------
   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


   ----------------------------------------------------------
   18. OS release
     From /etc/*-release /etc/*-version
     os-release SUSE Linux Enterprise Server 15 SP6
```

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Platform Notes (Continued)

```
   ----------------------------------------------------------------
   19. Disk information
   SPEC is set to: /home/Benchmark/speccpu2017r-Turin
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/nvme0n1p3 xfs   1.1T   70G  998G   7% /home


   ----------------------------------------------------------------
   20. /sys/devices/virtual/dmi/id
       Vendor:         FUJITSU
       Product:        PRIMERGY RX2450 M2
       Product Family: SERVER
       Serial:         xxxxxxxxxx


   ----------------------------------------------------------------
   21. dmidecode
     Additional information from dmidecode 3.4 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:
       7x Micron Technology MTC20F2085S1RC64BD2 MWFF 32 GB 2 rank 6400, configured at 6000
       5x Micron Technology MTC20F2085S1RC64BD2 UXCC 32 GB 2 rank 6400, configured at 6000
       12x Samsung M321R4GA3EB2-CCPKC 32 GB 2 rank 6400, configured at 6000


   ----------------------------------------------------------------
   22. BIOS
   (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:       FUJITSU // American Megatrends Inc.
     BIOS Version:      V5.0.0.35 R9.90.0 for D4129-A1x
     BIOS Date:         09/13/2024
     BIOS Revision:     9.90
     Firmware Revision: 2.45
```

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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
------------------------------------------------------------------------------


==============================================================================
C++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)
------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
------------------------------------------------------------------------------


==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
```

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SPEC CPU®2017 Integer Rate Result

Fujitsu

PRIMERGY RX2450 M2,
AMD EPYC 9655, 2.60 GHz

SPECrate®2017_int_base =   1990

SPECrate®2017_int_peak = Not Run

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

Test Date: Nov-2024
Hardware Availability: Jan-2025
Software Availability: Sep-2024

Compiler Version Notes (Continued)

```
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`clang`

C++ benchmarks:
`clang++`

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 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-Wl,-mllvm -Wl,-extra-inliner -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc-ext -ldl
```

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Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

Fujitsu

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CPU2017 License: 19	**Test Date:** Nov-2024
Test Sponsor: Fujitsu	**Hardware Availability:** Jan-2025
Tested by: Fujitsu	**Software Availability:** Sep-2024

Base Optimization Flags (Continued)

C++ benchmarks:
```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=advanced -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -fno-PIE -no-pie
-fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lflang -lamdalloc-ext
-ldl
```

Fortran benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto
-fepilog-vectorization-of-inductions -mllvm -optimize-strided-mem-cost
-floop-transform -mllvm -unroll-aggressive -mllvm -unroll-threshold=500
-lamdlibm -lflang -lamdalloc -ldl
```

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
  http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.00.html
  http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-Turin-RevB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.00.xml
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-Turin-RevB.xml

SPEC CPU®2017 Integer Rate Result

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Fujitsu

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Test Date: Nov-2024
Hardware Availability: Jan-2025
Software Availability: Sep-2024

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

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