Fujitsu
PRIMERGY LX1430 M1, AMD EPYC 7232P, 3.10 GHz

| Test Date: | Jan-2020 |
| Test Sponsor: | Fujitsu |
| Hardware Availability: | Nov-2019 |
| Software Availability: | Aug-2019 |

**SPECrate®2017_int_base = 54.9**

**SPECrate®2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_int_base (54.9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>16</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>16</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>16</td>
</tr>
<tr>
<td>520.ommnetpp_r</td>
<td>16</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>16</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>16</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>16</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>16</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>16</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>16</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** AMD EPYC 7232P
- **Max MHz:** 3200
- **Nominal:** 3100
- **Enabled:** 8 cores, 1 chip, 2 threads/core
- **Orderable:** 1 chip
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **Cache L2:** 512 KB I+D on chip per core
- **Cache L3:** 32 MB I+D on chip per chip, 8 MB shared / 2 cores
- **Memory:** 256 GB (8 x 32 GB 2Rx4 PC4-3200AA-L)
- **Storage:** 1 x SATA HDD, 2TB, 7.2K RPM
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 15 SP1 (x86_64) kernel version 4.12.14-195-default
- **Compiler:** C/C++/Fortran: Version 2.0.0 of AOCC
- **Parallel:** No
- **Firmware:** Fujitsu BIOS Version R07. Released Nov-2019
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage
Fujitsu
PRIMERGY LX1430 M1, AMD EPYC 7232P, 3.10 GHz

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

SPECrater®2017_int_base = 54.9
SPECrater®2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>16</td>
<td>633</td>
<td>40.3</td>
<td>631</td>
<td>40.4</td>
<td>634</td>
<td>40.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>502gcc_r</td>
<td>16</td>
<td>496</td>
<td>45.7</td>
<td>496</td>
<td>45.6</td>
<td>496</td>
<td>45.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>16</td>
<td>301</td>
<td>85.9</td>
<td>299</td>
<td>86.4</td>
<td>299</td>
<td>86.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>16</td>
<td>814</td>
<td>25.8</td>
<td>815</td>
<td>25.8</td>
<td>811</td>
<td>25.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>16</td>
<td>350</td>
<td>48.2</td>
<td>350</td>
<td>48.2</td>
<td>352</td>
<td>48.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>525.x264_r</td>
<td>16</td>
<td>231</td>
<td>121</td>
<td>232</td>
<td>121</td>
<td>232</td>
<td>121</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>16</td>
<td>374</td>
<td>49.1</td>
<td>377</td>
<td>48.7</td>
<td>373</td>
<td>49.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>541.leela_r</td>
<td>16</td>
<td>565</td>
<td>46.9</td>
<td>564</td>
<td>47.0</td>
<td>563</td>
<td>47.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>16</td>
<td>316</td>
<td>132</td>
<td>301</td>
<td>139</td>
<td>302</td>
<td>139</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>557.xz_r</td>
<td>16</td>
<td>533</td>
<td>32.4</td>
<td>532</td>
<td>32.5</td>
<td>532</td>
<td>32.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
'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>

Set dirty_ratio=8 to limit dirty cache to 8% of memory
Set swappiness=1 to swap only if necessary
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory
sync then drop_cache=3 to reset caches before invoking runcpu

dirty_ratio, swappiness, zone_reclaim_mode and drop_cache were all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

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

Fujitsu
PRIMERGY LX1430 M1, AMD EPYC 7232P, 3.10 GHz

SPECratio®2017_int_base = 54.9
SPECratio®2017_int_peak = Not Run

Operating System Notes (Continued)
Transparent huge pages set to 'always' for this run (OS default)

Environment Variables Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
"/home/Benchmark/speccpu2017/amd_rate_aocc200_rome_C_lib/64;/home/Benchmark/speccpu2017/amd_rate_aocc200_rome_C_lib/32:"
MALLOC_CONF = "retain:true"

General Notes
Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using Fedora 26

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 v9.1.0 in Ubuntu 19.04 with -O3 -znver2 -flto
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:
cTDP = 200
Determinism Slider = Power
Global C-state Control = Disabled
L1 Stream HW Prefetcher = Disabled
NUMA nodes per socket = NPS2
Package Power Limit = 200
SMT Control = Auto
SVM Mode = Disabled

Sysinfo program /home/Benchmark/speccpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbe6e46a485a0011
running on linux-56yp Fri Jan 24 08:36:33 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

(Continued on next page)
Fujitsu
PRIMERGY LX1430 M1, AMD EPYC 7232P, 3.10 GHz

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

Specrate®2017_int_base = 54.9
Specrate®2017_int_peak = Not Run

CPU2017 License: 19
Test Date: Jan-2020
Hardware Availability: Nov-2019
Software Availability: Aug-2019

Platform Notes (Continued)

From /proc/cpuinfo

```
model name : AMD EPYC 7232P 8-Core Processor
 1 "physical id"s (chips)
 16 "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 : 8
siblings : 16
physical 0: cores 0 1 4 5 8 9 12 13
```

From lscpu:

```
Architecture:        x86_64
CPU op-mode(s):      32-bit, 64-bit
Byte Order:          Little Endian
Address sizes:       43 bits physical, 48 bits virtual
CPU(s):              16
On-line CPU(s) list: 0-15
Thread(s) per core:  2
Core(s) per socket:  8
Socket(s):           1
NUMA node(s):        1
Vendor ID:           AuthenticAMD
CPU family:          23
Model:               49
Model name:          AMD EPYC 7232P 8-Core Processor
Stepping:            0
CPU MHz:             3100.000
CPU max MHz:         3100.0000
CPU min MHz:         1500.0000
BogoMIPS:            6200.47
Virtualization:      AMD-V
L1d cache:           32K
L1i cache:           32K
L2 cache:            512K
L3 cache:            8192K
NUMA node0 CPU(s):   0-15
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 xtopology nonstop_tsc cpuid extd_apicid aperfmpref perfctr_core perfctr_nb popcnt aes avx avx2 f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpt xi2 perfctr_l1 mwaitx cpb cat_l3 cdp_l3 hw_pstate sme ssbd sev ibrs ibpb stibp vmcall fsgsbase bmi1 avx2 smep bmi2 cmq rdt_a rdseed adx smap clflushopt clwb sha_ni xsaveopt xsaveasaves svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
```

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

Copyright 2017-2020 Standard Performance Evaluation Corporation

Fujitsu
PRIMERGY LX1430 M1, AMD EPYC 7232P, 3.10 GHz

SPECrate®2017_int_base = 54.9
SPECrate®2017_int_peak = Not Run

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

Test Date: Jan-2020
Hardware Availability: Nov-2019
Software Availability: Aug-2019

Platform Notes (Continued)

pfthreshold avic v_vmsave_vmload vgif umip 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: 1 nodes (0)
   node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
   node 0 size: 257512 MB
   node 0 free: 256689 MB
   node distances:
      node 0
      0: 10

From /proc/meminfo
   MemTotal: 263692552 kB
   HugePages_Total: 0
   Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="SLES"
      VERSION="15-SP1"
      VERSION_ID="15.1"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp1"

uname -a:
   Linux linux-56yp 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
   x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling:
   Not affected
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: Full AMD retpoline, IBPB:
      conditional, IBRS_FW, STIBP: conditional, RSB filling

(Continued on next page)
Platform Notes (Continued)

run-level 3 Feb 14 23:22

SPEC is set to: /home/Benchmark/speccpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 1.6T 15G 1.6T 1% /home

From /sys/devices/virtual/dmi/id
BIOS: GIGABYTE R07 08/30/2019
Vendor: GIGABYTE
Product: R152-Z31-FJ
Product Family: Server
Serial: GJI7P5821A0005

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:
8x Samsung M393A4K40DB3-CWE 32 kB 2 rank 3200
8x Unknown Unknown

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
   525.x264_r(base) 557.xz_r(base)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
   AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

C++ | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
     541.leela_r(base)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
   AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

(Continued on next page)
### Compiler Version Notes (Continued)

Fortran | 548.exchange2_r(base)
---|---
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/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:
- `-flto`
- `-Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math`

(Continued on next page)
Fujitsu
PRIMERGY LX1430 M1, AMD EPYC 7232P, 3.10 GHz

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

SPECrate®2017_int_base = 54.9
SPECrate®2017_int_peak = Not Run

Test Date: Jan-2020
Hardware Availability: Nov-2019
Software Availability: Aug-2019

Base Optimization Flags (Continued)

C benchmarks (continued):
- -march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50
- -fremap-arrays -mllvm -function-specialize -mllvm -enable-gvn-hoist
- -mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
- -mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
- -flv-function-specialization -z muldefs -lmvec -ljemalloc
- -lflang

C++ benchmarks:
- -flto -Wl,-mllvm -Wl,-function-specialize
- -Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
- -Wl,-mllvm -Wl,-reduce-array-computations=3
- -Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
- -mllvm -loop-unswitch-threshold=200000 -mllvm -vector-library=LIBMVEC
- -mllvm -unroll-threshold=100 -flv-function-specialization
- -mllvm -enable-partial-unswitch -z muldefs -lmvec -ljemalloc
- -lflang

Fortran benchmarks:
- -flto -Wl,-mllvm -Wl,-function-specialize
- -Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
- -Wl,-mllvm -Wl,-reduce-array-computations=3 -ffast-math
- -Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
- -Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver2 -funroll-loops
- -Mrecursive -mllvm -vector-library=LIBMVEC -z muldefs
- -mllvm -disable-indvar-simplify -mllvm -unroll-aggressive
- -mllvm -unroll-threshold=150 -lmvec -ljemalloc -lflang

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-ROME-RevB.xml

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 2020-01-23 18:36:32-0500.
Report generated on 2020-04-14 14:17:56 by CPU2017 PDF formatter v6255.
Originally published on 2020-04-14.