GROMACS - Bug #2990
Deprecate Armv7

06/20/2019 04:08 PM - Szilárd Pálí

Status: Closed
Priority: Normal
Assignee: Paul Bauer
Category: mdrun
Target version: 2020

Description
On a NEON build with gcc 8 (on jetson tk1) I get:

```
gmx: /nethome/pszilard/gromacs-master/src/gromacs/simd/impl_arm_neon/impl_arm_neon_simd4_float.h:7
8: gmx::Simd4Float gmx::load4(const float*): Assertion `size_t(m) % 16 == 0' failed.
Aborted
```

Related issues:
Precedes GROMACS - Bug #3274: Remove ARM NEON SIMD

Associated revisions
Revision fc017696 - 12/28/2019 07:34 AM - Mark Abraham
Stop testing ARMv7
Refs #2990
Change-id: 837daf20df266a44ca53f7388a05a0cae36bc47d

Revision d5e465a3 - 12/28/2019 07:48 AM - Mark Abraham
Remove support for ARMv7
Includes partial revert of 0d4ea6033cba8cbfe6
Refs #2990
Change-id: 7f1154a15f382a53af89b9f8b5370bfbfe47bfe66

Revision befea4fc - 12/28/2019 10:35 AM - Paul Bauer
Deprecate support for Armv7
Fixes #2990
Change-id: lac107d977fcd8ea67d8306149b9b6c17985afa4

Revision 9f283b4d - 12/28/2019 05:57 PM - Mark Abraham
Remove GMX_CYCLECOUNTERS
With ARMv7 support removed, cycle counters are available on all known platforms, so the CMake option to disable them can be removed. This change will be easy to revert if the need arises in future.
Includes partial revert of 0d4ea6033cba8cbfe6, which was added when supporting quirks of ARMv7.
Refs #2990
Change-id: lac107d977fcd8ea67d8306149b9b6c17985afa4
I'm trying this again now and I no longer get the error but a whole bunch of warnings.  
@Szilard is there still something to do here?

Paul Bauer wrote:

I'm trying this again now and I no longer get the error but a whole bunch of warnings.  
@Szilard is there still something to do here?

I've not tried and I can't prioritize this for beta1.

- Target version changed from 2020-beta1 to 2020-beta2

- Target version changed from 2020-beta2 to 2020-beta3

bump

- Target version changed from 2020-beta3 to 2020-rc1

bump!

This is the warning I get now (and a few more)
As far as I understand from reading about it this should be caused by different sizes of GMX_SIMD_ALIGNMENT and GMX_SIMD_FINT32_WIDTH

/home/jenkins/test-2020/gromacs/src/gromacs/simd/impl_arm_neon/impl_arm_neon_util_float.h: In function 'void gmx::gatherLoadBySimdIntTranspose(const float*, gmx::SimdFInt32, gmx::SimdFloat*, gmx::SimdFloat*, gmx::SimdFloat*, gmx::SimdFloat*)':
/home/jenkins/test-2020/gromacs/src/gromacs/simd/impl_arm_neon/impl_arm_neon_util_float.h:274:75: warning: requested alignment 16 is larger than 8 [-Wattributes]
    alignas(GMX_SIMD_ALIGNMENT) std::int32_t ioffset[GMX_SIMD_FINT32_WIDTH];

No, those are both 16.

Somehow the compiler seems to want to have an alignment of 8 instead of 16. I don't know why the compiler wants 8. 16 should give better performance.

this should be the result of std::max_align_t being not correct for this case according to my google searches, but I don't get why it becomes an issue here

ARMv7 doesn't actually have 128-bit registers, so our x86-based assumptions do not apply

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That constant is 8, because that's necessary for double to load on ARMv7. But it only documents the maximum alignment needed for loading any scalar type, which is a different thing from the alignment necessary for SIMD-style loads. The warning would be useful if we were allocating lots of excessively aligned things, but we don't. There's also a pile of other warnings with recent gcc on ARMv7 that aren't worth fixing. Since there's never been a relevant ARMv7 system, and won't be one, we should retire supporting and testing this arch before releasing 2020.

#11 - 12/09/2019 02:21 PM - Mark Abraham
These warnings could be suppressed with `-Wno-attributes` for ARMv7 if we want. But as there are numerous other warnings issued by gcc 8 on ARMv7 that look benign, and as ARMv7 is not an interesting platform for HPC, I suggest we either announce it as deprecated in GROMACS 2020. Or just drop it outright.

#12 - 12/20/2019 08:25 AM - Paul Bauer
- Assignee set to Paul Bauer
- Target version changed from 2020-rc1 to 2020

I'll add it to the deprecation list

#13 - 12/27/2019 04:36 PM - Paul Bauer
- Subject changed from ARM neon SIMD4 error to Deprecate Armv7
- Status changed from New to Fix uploaded

https://gerrit.gromacs.org/c/gromacs/+/15066

#14 - 12/28/2019 07:53 AM - Mark Abraham
- Precedes Bug #3274: Remove ARM NEON SIMD added

#15 - 12/28/2019 10:54 AM - Paul Bauer
- Status changed from Fix uploaded to Resolved

#16 - 12/28/2019 10:54 AM - Paul Bauer
- Status changed from Resolved to Closed