GROMACS - Task #2183

GPU-accessed memory page-locking and page sizes

05/19/2017 01:23 PM - Aleksei Iupinov

Status:	Closed
Priority:	High
Assignee:	
Category:	core library
Target version:	2019
Difficulty:	uncategorized

Description

In order to have fast asynchronous transfers between host and CUDA GPUs, host memory buffers need to be page-locked (aligned with the memory page size + exposed to CUDA via cudaHostRegister() function).
There is a crude hack for PME GPU purposes, which aligns existing coordinates, charges and forces buffers:
https://gerrit.gromacs.org/#/c/6578
There is also a tangent work by Mark: https://gerrit.gromacs.org/#/c/6552
No matter which code we would use, the important questions are whether and how we would want to use page-aligned memory conditionally (e.g. based on PME running on CPU/GPU), and could we face problems/limits otherwise
(consider a dozen of ranks each using a dozen of page-aligned buffers with whatever large page size).
One long-term solution would be having a page-locked memory provider object which would minimize the paged memory use.

History

#1 - 05/19/2017 01:23 PM - Aleksei Iupinov

- Blocks Feature #2054: PME on GPU added

#2 - 05/19/2017 05:33 PM - Aleksei Iupinov

- Subject changed from GPU memory page-locking and page sizes to GPU-accessed memory page-locking and page sizes

#3 - 11/28/2017 06:05 PM - Mark Abraham

- Target version set to 2019

I'm sure there's things to improve here moving forward!

#4 - 11/28/2017 06:06 PM - Mark Abraham

- Blocks deleted (Feature #2054: PME on GPU)

#5 - 11/28/2017 07:22 PM - Szilárd Páll

- Status changed from New to In Progress

Mark Abraham wrote:

> I'm sure there's things to improve here moving forward!

Is there? I think most if not all use-cases are covered by the (still) so-called HostAllocator implementation. If there are remaining cases relevant for this release and current its use-cases, let's keep this issue, otherwise, I suggest focusing on what we want to do next and organize ideas/requirements on new issues for that we can target specifically.

#6 - 11/28/2017 07:23 PM - Szilárd Páll

Marked it "in progress" for now, but as noted above, unless there are objections, this might be best closed.

#7 - 12/19/2017 03:02 AM - Mark Abraham

- Status changed from In Progress to Closed

needs to be closed because it's listed as blocking other stuff