

## GROMACS - Task #2183

### GPU-accessed memory page-locking and page sizes

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

<b>Status:</b>	Closed
<b>Priority:</b>	High
<b>Assignee:</b>	
<b>Category:</b>	core library
<b>Target version:</b>	2019
<b>Difficulty:</b>	uncategorized
<b>Description</b>	
<p>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 <code>cudaHostRegister()</code> function). There is a crude hack for PME GPU purposes, which aligns existing coordinates, charges and forces buffers: <a href="https://gerrit.gromacs.org/#/c/6578">https://gerrit.gromacs.org/#/c/6578</a> There is also a tangent work by Mark: <a href="https://gerrit.gromacs.org/#/c/6552">https://gerrit.gromacs.org/#/c/6552</a> 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.</p>	

#### History

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

- Blocks Feature #2054: PME on GPU added

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

- 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