

## GROMACS - Task #3315

Feature # 3311 (In Progress): GPU infrastructure development

Feature # 3313 (Accepted): Introduce and use opaque types for the DeviceStream and DeviceContext

### Platform agnostic DeviceContext

01/22/2020 08:50 AM - Artem Zhmurov

<b>Status:</b>	Resolved
<b>Priority:</b>	Normal
<b>Assignee:</b>	Artem Zhmurov
<b>Category:</b>	
<b>Target version:</b>	2021-refactoring
<b>Difficulty:</b>	uncategorized
<b>Description</b>	
Introduce opaque DeviceContext data type	
Code:	
1. <a href="https://gerrit.gromacs.org/#/c/gromacs/+15597/">https://gerrit.gromacs.org/#/c/gromacs/+15597/</a> - Make OpenCL DeviceVendor into enum class and move to GPU traits.	
2. <a href="https://gerrit.gromacs.org/#/c/gromacs/+15599/">https://gerrit.gromacs.org/#/c/gromacs/+15599/</a> - Move DeviceInfo into GPU traits.	
3. <a href="https://gerrit.gromacs.org/#/c/gromacs/+15600/">https://gerrit.gromacs.org/#/c/gromacs/+15600/</a> - Make DeviceContext into a proper class.	
4. <a href="https://gerrit.gromacs.org/#/c/gromacs/+15657/">https://gerrit.gromacs.org/#/c/gromacs/+15657/</a> - Make use of non-default constructor of DeviceContext.	
5. <a href="https://gerrit.gromacs.org/#/c/gromacs/+15658/">https://gerrit.gromacs.org/#/c/gromacs/+15658/</a> - Take over management of OpenCL context from PME and NBNXM.	

#### Associated revisions

##### Revision ca9c6942 - 02/06/2020 12:24 AM - Artem Zhmurov

Make OpenCL DeviceVendor into enum class and move to GPU traits

The device context in OpenCL requires the information on vendor when constructed. To prepare for opaque DeviceContext, the vendor enum was moved into OpenCL traits.

Refs. #3311, needed for #3315.

Change-Id: Iec22ff17543b6a99407048de6e0cd82bb7218fb0

##### Revision e742ad10 - 02/06/2020 03:49 AM - Artem Zhmurov

Move DeviceInfo into GPU traits

The DeviceInfo is needed upon construction of DeviceContext. To prepare for opaque DeviceContext type, it is moved to GPU traits and renamed according to the common naming scheme.

Refs. #3311, needed for #3315.

Change-Id: I2a9f1d932f142d645df75901521a734d208de509

##### Revision 345378d4 - 03/09/2020 06:33 PM - Artem Zhmurov

Make DeviceContext into a proper class

Having DeviceContext as a platform-agnostic class allows one to easily create context, which is useful for setting up the GPU stream/context manager, tests for GPU functionality.

Refs. #3315.

Change-Id: I496d225b58c96d7642830c8e9552139750891849

##### Revision 84e5a0e6 - 03/10/2020 08:02 AM - Artem Zhmurov

Use init(..) function to build DeviceContext

This patch unifies the logic of OpenCL context creation in PME and NBNXM by using the same init(..) function for the DeviceContext

object.

Also, the DeviceInfo is now de-referenced directly after the check on the pointer validity and passed along as a const reference, which improves the clarity of the code.

Refs. #3315, #3311.

Change-Id: I5ba0f530918f3340fa1a5ad3e8d60fe4e0967dab

#### **Revision 6975bfd - 03/11/2020 03:59 PM - Artem Zhmurov**

Take over management of OpenCL context from PME and NBNXM

This patch set creates the DeviceContext in runner and passes it to the consumers (PME and NBNXM). This removes unnecessary management code duplication, makes the device buffers in two modules compatible.

Fixes #2522

Fixes #3315

Refs #3311

Change-Id: I10358cfaced5b5c7dbddf95679c9a9703f3a2c0

### **History**

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#### **#1 - 01/22/2020 09:39 AM - Artem Zhmurov**

- *Tracker changed from Feature to Task*

- *Assignee set to Artem Zhmurov*

- *Target version set to 2021*

#### **#2 - 01/22/2020 09:40 AM - Artem Zhmurov**

- *Status changed from New to Accepted*

#### **#3 - 01/22/2020 09:49 AM - Artem Zhmurov**

- *Target version changed from 2021 to 2021-refactoring*

#### **#4 - 02/01/2020 01:53 PM - Artem Zhmurov**

- *Description updated*

#### **#5 - 02/01/2020 01:54 PM - Artem Zhmurov**

- *Status changed from Accepted to In Progress*

#### **#6 - 02/01/2020 04:45 PM - Artem Zhmurov**

- *Description updated*

#### **#7 - 03/11/2020 04:15 PM - Artem Zhmurov**

- *Status changed from In Progress to Resolved*

Applied in changeset [6975bfd22030a08bbe076151a3de69894a4de2f](#).