NVIDIA's PhysX is a scalable multi-platform game physics solution, that has been used in many of today's popular games. In addition to the native physics engine of CRYENGINE (***CryPhysics***), this feature allow CRYENGINE users to use the Nvidia's third party physics engine (**PhysX**) as an external physics engine within the CRYENGINE.

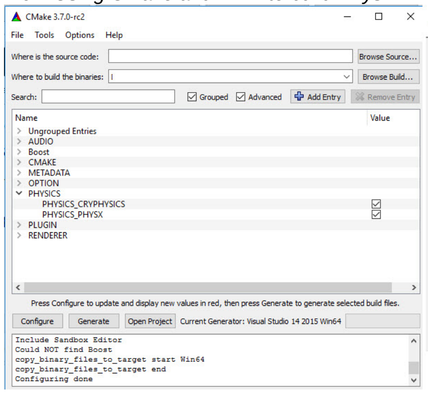
The integration of Nvidia's PhysX is minimal-inversive. Basically, the CryPhysics interface **IPhysicalWorld** has been implemented for PhysX to replace the physics engine. The PhysX interface-code can be found in *../Code/CryEngine/CryPhysicsSystem/CryPhysX/.* The interface can be compiled using CMake and WAF build systems.

By using Nvidia's PhysX, there is a possibility of using Nvidia's PhysX Visual Debugger (PVD). This allows recording and exploring of the game world's physics which might be very useful. You can also use basic visual debugging features available directly within CRYENGINE through ***p_draw_helpers*** com mand in the console.

Installing and Enabling PhysX in CRYENGINE

Follow the below mentioned steps to install and enable PhysX in CRYENGINE:

1. Install NVIDIA's PhysX SDK 3.3 (this is not shipped with CRYENGINE, but available for free from Nvidia).
2. Compile the CRYENGINE with PhysX enabled (supported in CMake and WAF). This will create the PhysX interface in ***CryPhysX.dll.***
   Pic1: Using CMake and WAF to build PhysX.

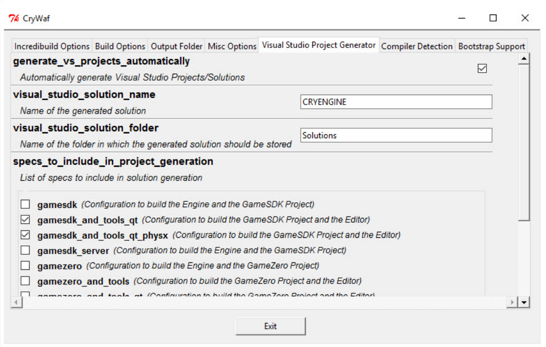


Where is the source code:
Where to build the binaries: I
Search:
☑ Grouped ☑ Advanced

Name	Value
Ungrouped Entries	
AUDIO	
Boost	
CMAKE	
METADATA	
OPTION	
PHYSICS	
PHYSICS_CRYPHYSICS	☑
PHYSICS_PHYSX	☑
PLUGIN	
RENDERER	

Press Configure to update and display new values in red, then press Generate to generate selected build files.
Current Generator: Visual Studio 14 2015 Win64

```
Include Sandbox Editor
Could NOT find Boost
copy_binary_files_to_target start Win64
copy_binary_files_to_target end
Configuring done
```



generate_vs_projects_automatically ☑
Automatically generate Visual Studio Projects/Solutions
visual_studio_solution_name CRYENGINE
Name of the generated solution
visual_studio_solution_folder Solutions
Name of the folder in which the generated solution should be stored
specs_to_include_in_project_generation
List of specs to include in solution generation

- ☐ **gamesdk** *(Configuration to build the Engine and the GameSDK Project)*
- ☑ **gamesdk_and_tools_qt** *(Configuration to build the GameSDK Project and the Editor)*
- ☑ **gamesdk_and_tools_qt_physx** *(Configuration to build the GameSDK Project and the Editor)*
- ☐ **gamesdk_server** *(Configuration to build the Engine and the GameSDK Project)*
- ☐ **gamezero** *(Configuration to build the Engine and the GameZero Project)*
- ☐ **gamezero_and_tools** *(Configuration to build the GameZero Project and the Editor)*

3. Ensure, the following **PhysX-dll** can be found by CRYENGINE, either by changing your system environment path variables or by copying the following PhysX-dll into your bin folder:
   - PhysX3*_x64.dll
   - PhysX3CharacterKinematic*_x64.dll
   - PhysX3Common*_x64.dll
   - PhysX3Cooking*_x64.dll
4. Add the following variables to CRYENGINE's ***system.cfg*** *file*, this allows the CRYENGINE to load Nvidia's **PhysX** instead of the native **CryPhysi cs** and disable the other unimplemented features:

```
p_physics_library = "CryPhysX"

e_OnDemandPhysics = 0

e_onDemandMaxSize = 999999

p_draw_helpers_num = 0

e_PhysOceanCell=0
```

CVar

CVar /Command	Description	Comment and examples
g_MaxSimpl eCollisions	Used to cap the amount of rigidbody collision events per frame.	Works only when ***g_DisableCollisionDaamage*** is active (otherwise game-important collisions might be missed). This CVar is useful for profiling, since otherwise the costs of collision event processing can overwhelm the cost of the simulation, especially since it happens synchronously in the main thread.
p_draw_help ers	Supports limited subset of *CryPhy sics* helpers.	Any non-0 enables PhysX helpers • _c in the suffix: Renders contact points/normals. • _g in the suffix: Renders collision shapes. • _b in the suffix: Renders AABBs.

p_draw_helpers_num	Specifies bitwise, numerical version of p_draw_helpers (see above).	
p_physics_library	Sets the *physics.dll* in **system.cfg.**	"***CryPhysX***" for PhysX, "***CryPhysics***" for CryPhysics.

Limitations

Nvidia's PhysX does not support dynamic concave objects (in contrast to CryPhysics). The existing concave proxies (for example, vehicles) are not added to the physics world. Therefore, the proxies must be adapted to convex to behave correctly.

The PhysX-interface is a beta feature at the moment. Currently, not all features of the CryPhysics are supported in the moment. There are few limitations which are outlined below:

- only 4-wheeled vehicles supported.
- very basic living entity (but since this is normally changed by game-code anyway, this is not a major limitation).
- no ray-intersection with water surfaces.
- no breakability systems.
- no water/air areas.
- rope simulation is very basic.
- occlusion of explosions.
- character cloth (but you might check out VCloth 2.0, the cloth simulation feature of CryEngine, which is addressing this feature explicitly).

Feedback

As this is a Beta Feature, it is still in development and we would love to hear what you think about it. Please provide us with any feedback you have through the **CRYENGINE Community forum**!