• NVIDIA OptiX Ray Tracing Engine

- NVIDIA's ray tracing engine based on CUDA
- Requires NVIDIA GPU to work



NVIDIA's commercial renderer, Iray, is built upon OptiX Technology



Prerequisite - CUDA Toolkit

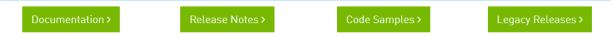
- NVIDIA's GPGPU interface
- Download latest version at:
 - https://developer.nvidia.com/cuda-downloads

CUDA	A Toolkit 9.2 Download	
Home	ComputeWorks > CUDA Toolkit > CUDA Toolkit 9.2 Download	

Select Target Platform							
Click on the green buttons that describe your target platform. Only supported platforms will be shown.							
Operating System	Windows Linux Mac OSX						

For Linux on POWER 9

Before updating to the latest version of CUDA 9.2 (9.2.148) on the AC922 POWER 9 system, ensure that the IBM AC922 system firmware has been upgraded to at least the version of OP910.24 or OP920.02. Please note that these versions may not yet be available and as such, the end user should wait to upgrade CUDA until after this supporting firmware is available and installed.





Prerequisite - CMake

- Used for generate various open-source build environments, including OptiX samples
- Download latest version at: <u>http://www.cmake.org/download/</u>

Latest Release (3.12.1)

The release was packaged with CPack which is included as part of the release. The .sh files are self extracting gziped tar files. To install a .sh file, run it with /bin/sh and follow the directions. The OS-machine.tar.2 files are gziped tar files of the install tree. The OS-machine.tar.2 files are compressed tar files of the install tree. The tar file distributions can be untared in any directory. They are prefixed by the version of CMake. For example, the Linux-x86_64 tar file is all under the directory cmake-Linux-x86_64. This prefix can be removed as long as the share, bin, man and doc directories are moved relative to each other. To build the source distributions, unpack them with zip or tar and follow the instructions in Readme.tx at the top of the source tree. See also the CMake 3.12 Release Notes. Source distributions:

Platform	Files
Unix/Linux Source (has \n line feeds)	cmake-3.12.1.tar.gz
	cmake-3.12.1.tar.Z
Windows Source (has \r\n line feeds)	cmake-3.12.1.zip
Binary distributions:	
Platform	Files
Windows win64-x64 installer: Installer tool has changed. Uninstall CMake 3.4 or lower first!	cmake-3.12.1-win64-x64.msi
Windows win64-x64 ZIP	cmake-3.12.1-win64-x64.zip
Windows win32-x86 Installer: Installer tool has changed. Uninstall CMake 3.4 or lower first!	cmake-3.12.1-win32-x86.msi
Windows win32-x86 ZIP	cmake-3.12.1-win32-x86.zip
Mac OS X 10.7 or later	cmake-3.12.1-Darwin-x86_64.dmg
	cmake-3.12.1-Darwin-x86_64.tar.gz
Linux x86_64	cmake-3.12.1-Linux-x86_64.sh
	cmake-3.12.1-Linux-x86_64.tar.gz



Download verification:

Role

Cryptographic Hashes

cmake-3.12.1-SHA-256.txt

Files

- Once both prerequisites are installed, grab OptiX from following location:
 - <u>https://developer.nvidia.com/designworks/op</u> <u>tix/download</u>

- Computer environment of TA:
 - Windows 10, 64 bit
 - Visual Studio 2015
 - CUDA 9.2 version
 - Cmake 3.12.1 version
 - Optix 5.1.0



• Let's make project files for OptiX samples!

- Run cmake-gui
- 1) Set source code to OptiX SDK location
 In Windows, default location is following:

•%ProgramData%\ NVIDIA Corporation\ OptiX SDK {version}\ SDK

2) Set destination to a new folder
Don't set it to the same folder of SDK itself

CMake 3.12.1 - D:/Project/Optix-Samples	_		×		
File Tools Options Help					
Where is the source code C:/ProgramData/NVIDIA Corporation/OptiX SDK 5,1,0/SDK Browse Source					
Where to build the binari 2) D:/Project/Optix-Samples	∽ Bro	owse Bu	ild		
Search: 🗌 Grouped 🗌 Advanced 🛟 Add Entry	Si R	lemove B	Entry		



Let's make project files for OptiX samples! 3) recommend that entities are set as follow:

Name	Value
CMAKE_BUILD_TYPE	Release
CMAKE_CONFIGURATION_TYPES	Debug;Release;MinSizeRel;RelWithDebInfo
CMAKE_INSTALL_PREFIX	C:/Program Files/OptiX-Samples
CUDA_64_BIT_DEVICE_CODE	
CUDA_CHECK_DEPENDENCIES_DURING_COMPILE	
CUDA_ENABLE_BATCHING	
CUDA_GENERATE_DEPENDENCIES_DURING_CONFIGURE	
CUDA_HOST_COMPILER	\$(VCInstallDir)bin
CUDA_NVRTC_ENABLED	
CUDA_REMOVE_GLOBAL_MEMORY_SPACE_WARNING	
CUDA_SDK_ROOT_DIR	CUDA_SDK_ROOT_DIR-NOTFOUND
CUDA_TOOLKIT_ROOT_DIR	C:/Program Files/NVIDIA GPU Computing Toolkit/CUDA/v9.2
CUDA_USE_STATIC_CUDA_RUNTIME	C: (Program Date (NIV) DIA Corporation (OntiX SDK 5.1.0 (include
OptiX_INCLUDE OptiX_INSTALL_DIR	C:/ProgramData/NVIDIA Corporation/OptiX SDK 5.1.0/include C:/ProgramData/NVIDIA Corporation/OptiX SDK 5.1.0/SDK/
mdl_wrapper_INCLUDE_DIR	C:/ProgramData/NVIDIA Corporation/OptiX SDK 5.1.0/SDK/ C:/ProgramData/NVIDIA Corporation/OptiX SDK 5.1.0/SDK/support/mdl_wrapper/include
mdl_wrapper_LIBRARY	C:/ProgramData/NVIDIA Corporation/OptiX SDK 5.1.0/SDK/support/mdl_wrapper/lib/mdl_wrapper.lib
optix_DLL	C:/ProgramData/NVIDIA Corporation/OptiX SDK 5.1.0/bin64/optix.51.dll
optix_LIBRARY	C:/ProgramData/NVIDIA Corporation/OptiX SDK 5.1.0/lib64/optix.51.lib
optix_prime_DLL	C:/ProgramData/NVIDIA Corporation/OptiX SDK 5.1.0/bin64/optix_prime.1.dll
optix_prime_LIBRARY	C:/ProgramData/NVIDIA Corporation/OptiX SDK 5.1.0/lib64/optix_prime.1.lib
optixu_DLL	C:/ProgramData/NVIDIA Corporation/OptiX SDK 5.1.0/bin64/optixu.1.dll
optixu_LIBRARY	C:/ProgramData/NVIDIA Corporation/OptiX SDK 5.1.0/lib64/optixu.1.lib



• Let's make project files for OptiX samples!

- 4) Click "Generate" button below
- 5) Set appropriate build environment
- Now you have your build environment!

		?	Х
÷	A		
	Specify the generator for this project		
	Visual Studio 14 2015 Win64		-
	Optional toolset to use (argument to -T)		
	Use default native compilers		
	 Specify native compilers 		
	O Specify toolchain file for cross-compiling		
	 Specify options for cross-compiling 		
	Fisiah	Conor	



• Let's make project files for OptiX samples!

 If Cmake does not find the compiler, you should modify Visual Studio (Setting→Applications→Modify) to install "Universal Windows App Development Tools".

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Next

Compile with your environments

- In Unix-like OS, default is Makefile
 - Just compile it with "make all"
- In Windows, use Visual Studio solutions
 Build "ALL_BUILD" project to compile everything

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PA1 (OptiX) submit screenshots of following projects:

- optixPathTracer, optixMotionBlur, optixMDLDisplacement
- Also, take a look at codes for simple projects to learn how they works
 - optixTutorial, optixSpherePP, whitted, ...

