
PA1 – Playing with OptiX

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- **NVIDIA OptiX Ray Tracing Engine**
 - NVIDIA's ray tracing engine based on CUDA
 - Requires NVIDIA GPU to work
 - Requires Windows or Linux systems



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

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- Prerequisite - CUDA Toolkit
 - NVIDIA's GPGPU interface
 - Download latest version at:
<https://developer.nvidia.com/cuda-downloads>

CUDA Toolkit 12.2 Downloads

Home

Select Target Platform

Click on the green buttons that describe your target platform. Only supported platforms will be shown. By downloading and using the software, you agree to fully comply with the terms and conditions of the [CUDA EULA](#).

Operating System

Linux

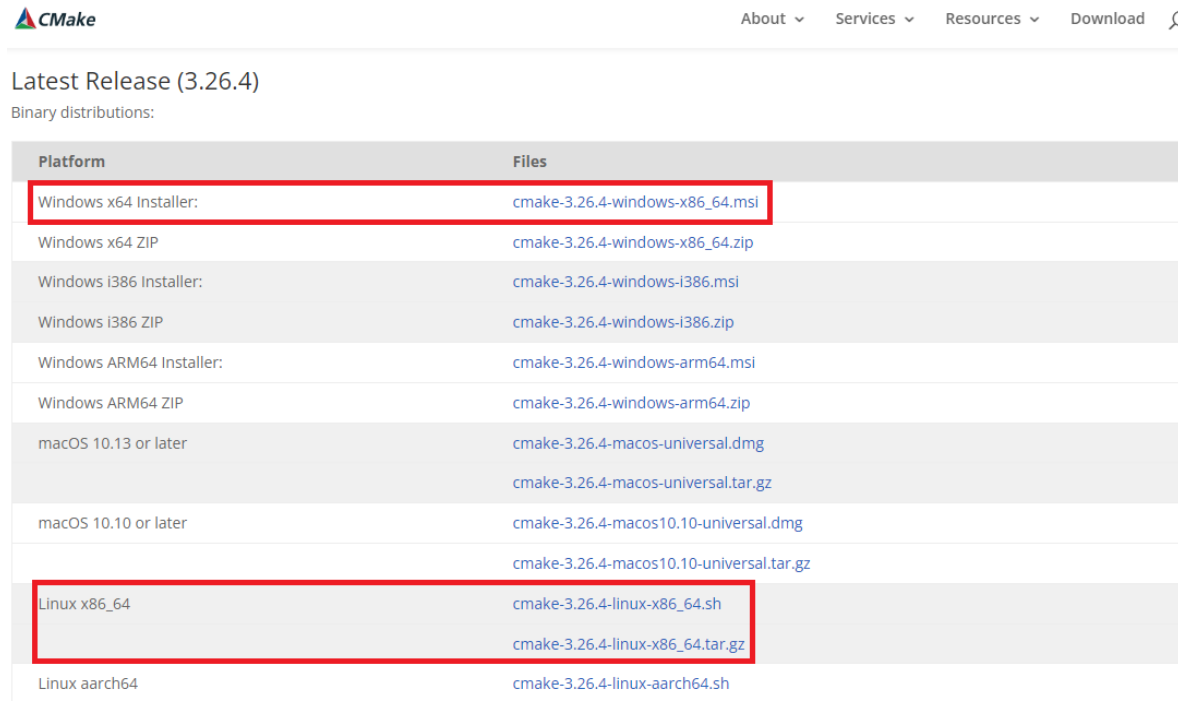
Windows

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- Prerequisite - CMake

- Used for generate various open-source build environments, including OptiX samples
- Download latest version at:

<http://www.cmake.org/download/>



The screenshot shows the CMake website's 'Latest Release (3.26.4)' page. It features a navigation bar with 'About', 'Services', 'Resources', and 'Download' links. Below the header, the text 'Binary distributions:' is followed by a table listing various platform-specific installers and source files. Two rows are highlighted with red boxes: 'Windows x64 Installer' pointing to 'cmake-3.26.4-windows-x86_64.msi' and 'Linux x86_64' pointing to 'cmake-3.26.4-linux-x86_64.sh' and 'cmake-3.26.4-linux-x86_64.tar.gz'.

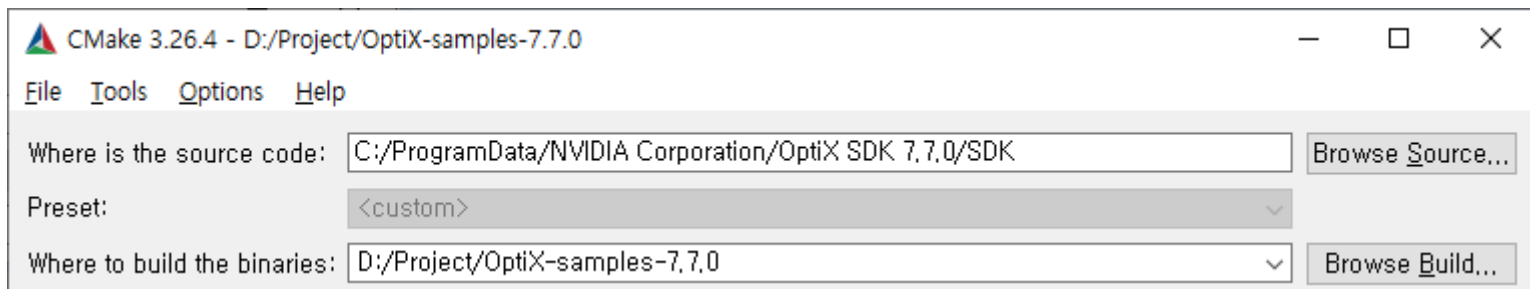
Platform	Files
Windows x64 Installer:	cmake-3.26.4-windows-x86_64.msi
Windows x64 ZIP	cmake-3.26.4-windows-x86_64.zip
Windows i386 Installer:	cmake-3.26.4-windows-i386.msi
Windows i386 ZIP	cmake-3.26.4-windows-i386.zip
Windows ARM64 Installer:	cmake-3.26.4-windows-arm64.msi
Windows ARM64 ZIP	cmake-3.26.4-windows-arm64.zip
macOS 10.13 or later	cmake-3.26.4-macos-universal.dmg cmake-3.26.4-macos-universal.tar.gz
macOS 10.10 or later	cmake-3.26.4-macos10.10-universal.dmg cmake-3.26.4-macos10.10-universal.tar.gz
Linux x86_64	cmake-3.26.4-linux-x86_64.sh cmake-3.26.4-linux-x86_64.tar.gz
Linux aarch64	cmake-3.26.4-linux-aarch64.sh

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- Once both prerequisites are installed, grab OptiX from following location:
 - Requires to join NVIDIA Developer Program Membership
 - <https://developer.nvidia.com/designworks/optix/download>
- Tested environment by TA:
 - Windows 10, 64 bit/Visual Studio 2019
 - Ubuntu 20.04
 - CUDA 11.4 version
 - Cmake 3.21.1 version
 - Optix 7.3.0

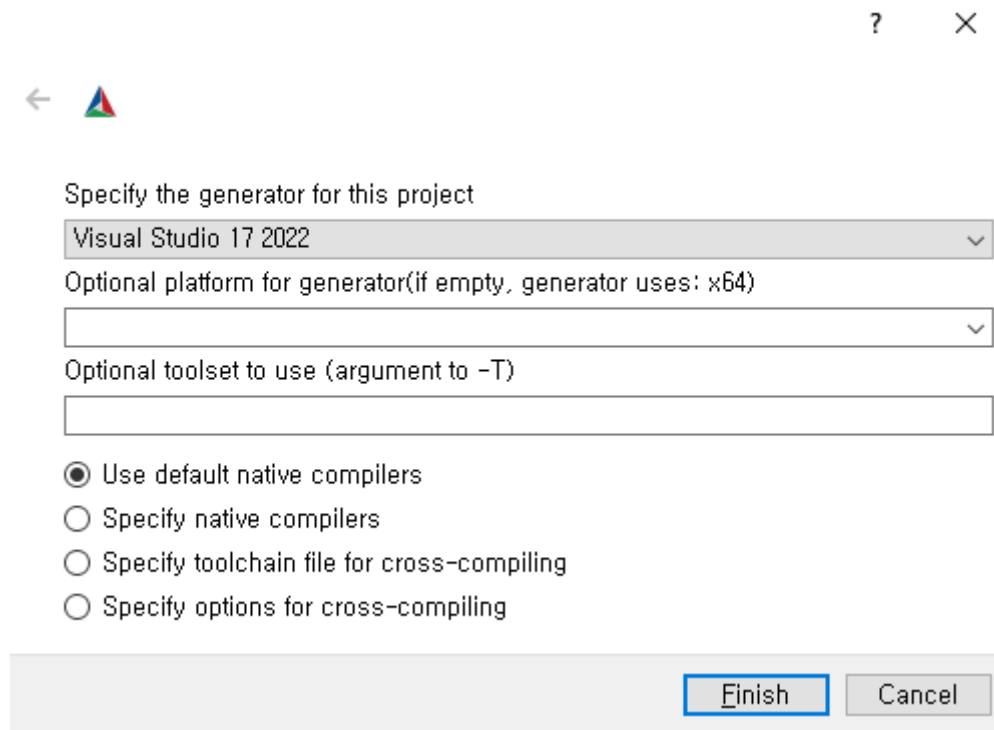
PA1 – Playing with OptiX

- 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



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- Let's make project files for OptiX samples!
 - 3) Click "Configure" and specify your build environment



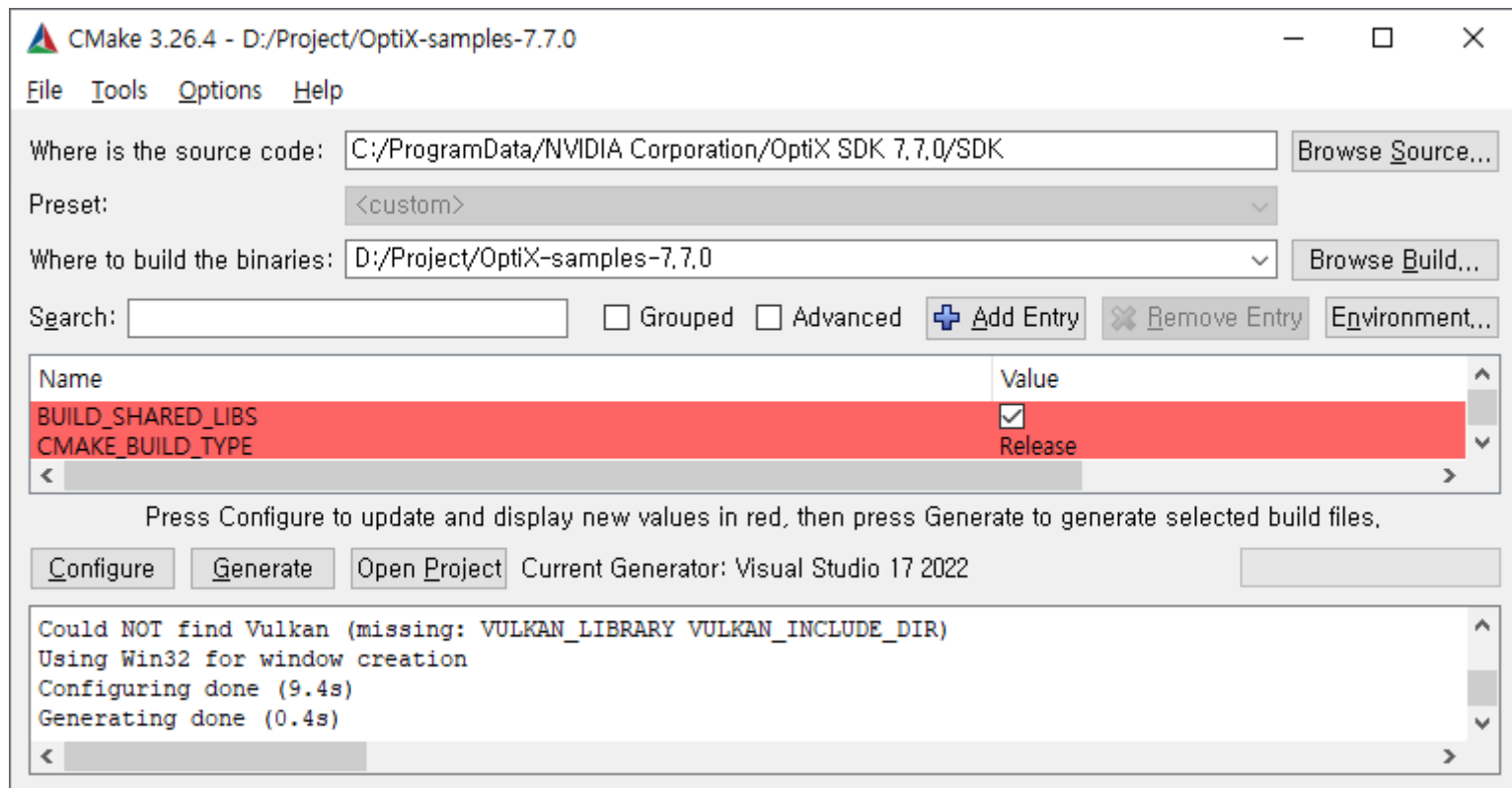
A screenshot of a configuration dialog box in Visual Studio. The dialog has a title bar with a question mark and a close button (X). On the left side, there is a back arrow and the Visual Studio logo. The main content area contains the following fields and options:

- Label: "Specify the generator for this project"
- Dropdown menu: "Visual Studio 17 2022" (with a downward arrow)
- Label: "Optional platform for generator(if empty, generator uses: x64)"
- Dropdown menu: (empty) (with a downward arrow)
- Label: "Optional toolset to use (argument to -T)"
- Text input field: (empty)
- Radio button options:
 - Use default native compilers
 - Specify native compilers
 - Specify toolchain file for cross-compiling
 - Specify options for cross-compiling

At the bottom right, there are two buttons: "Finish" and "Cancel".

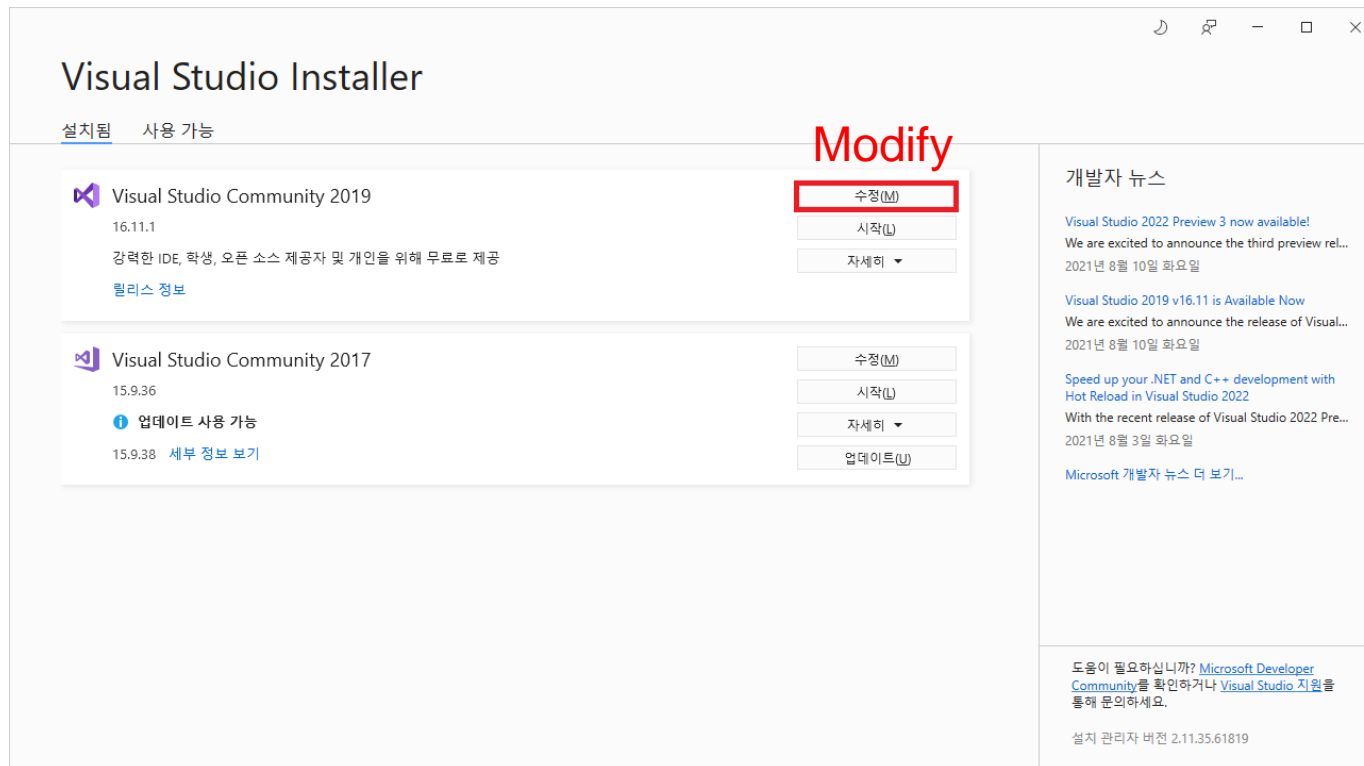
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- Let's make project files for OptiX samples!
 - 4) If configuring is done, click "Generate" to generate build files.



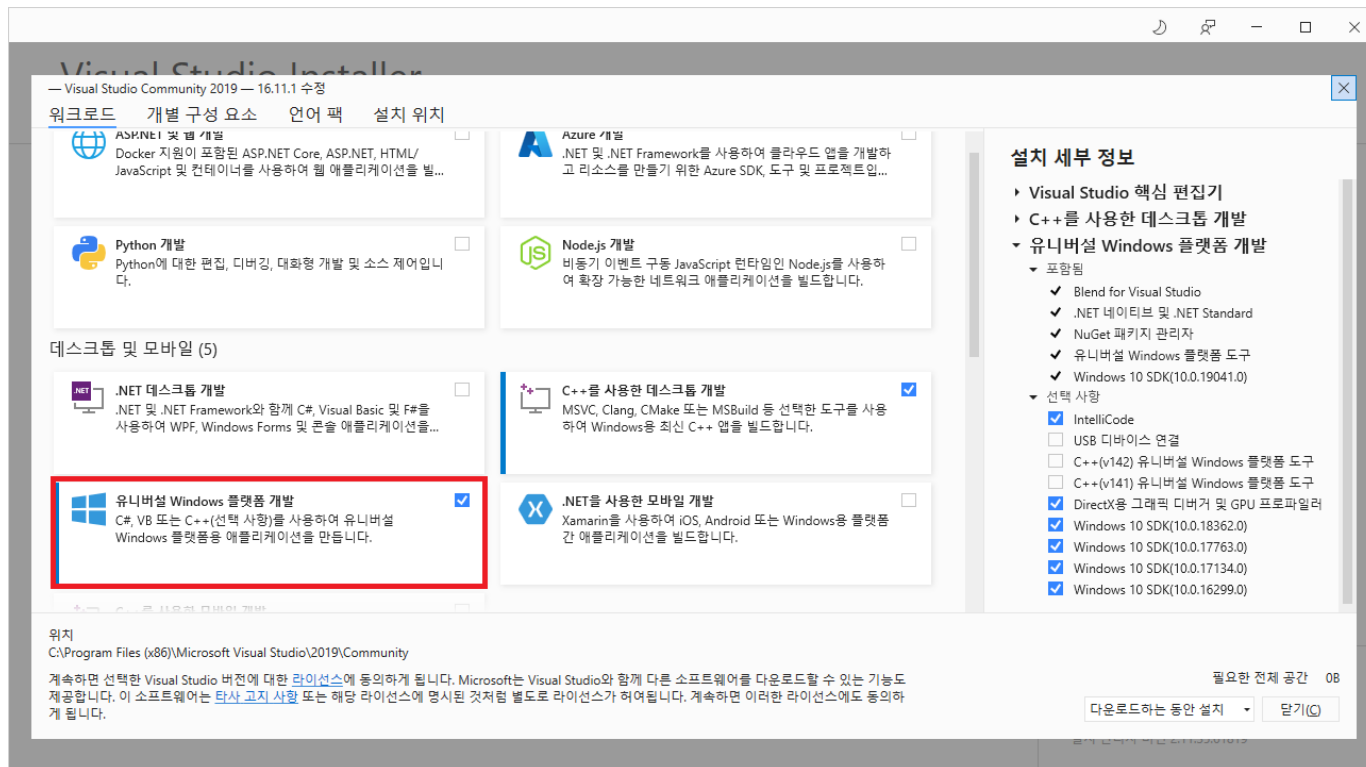
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- Let's make project files for OptiX samples!
 - If Cmake does not find the compiler, you should modify your Visual Studio to install Universal Windows App Development Tools.



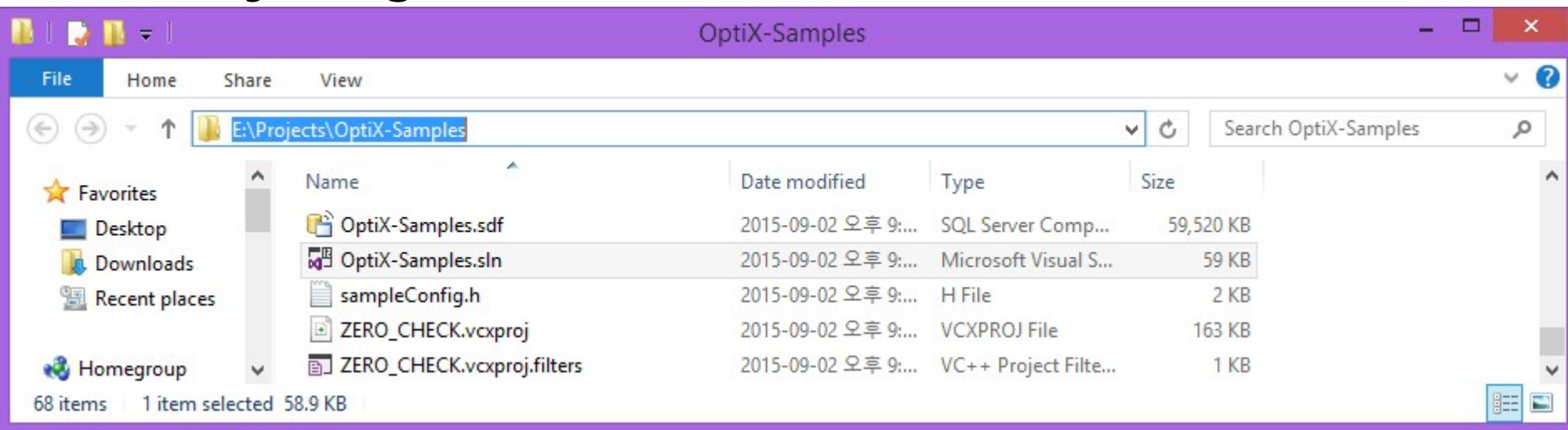
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PA1 – Playing with OptiX

- **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**



PA1 – Playing with OptiX

- PA1 (OptiX)

Submit screenshots of following projects:

- optixPathTracer, optixSimpleMotionBlur, optixCutouts
- Also, take a look at codes for simple projects to learn how they works
 - optixTriangle, optixSphere, optixWhitted, ...

