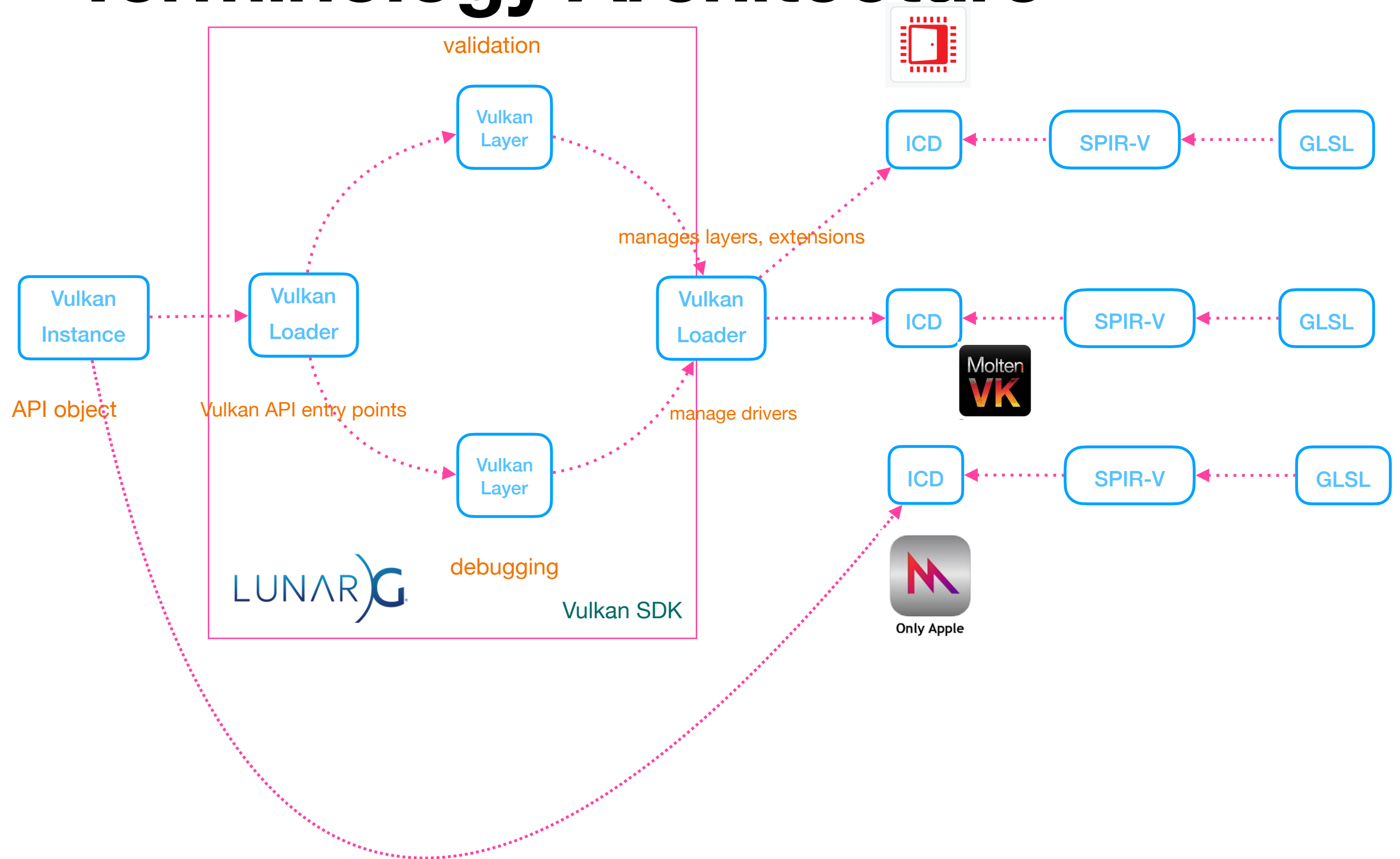


Terminology Architecture



Install Vulkan SDK on Mac

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Vulkan SDK Introduction

What is Khronos Vulkan API?

1. What is Khronos Vulkan API?
 1. Vulkan API is explicit
 2. Vulkan API is low-overhead
 3. Vulkan API is cross-platform graphics API
 4. Vulkan API is cross-platform compute API
 5. Vulkan API over operating system
 6. Vulkan API on wide variety of devices as PC/
mobile/embedded platforms

Vulkan SDK Introduction

What does Vulkan SDK do?

2. What does Vulkan SDK do?
 1. Vulkan SDK enables Vulkan Developer to develop Vulkan applications
3. What does Vulkan SDK include?
 1. Vulkan API usage validation
 2. Vulkan Layer configuration
 3. SPIR-V shader compilation
 4. SPIR-V shader optimization
 5. SPIR-V shader validation
 6. Vulkan System report

MoltenVK

Vulkan SDK that used on macOS, iOS platforms

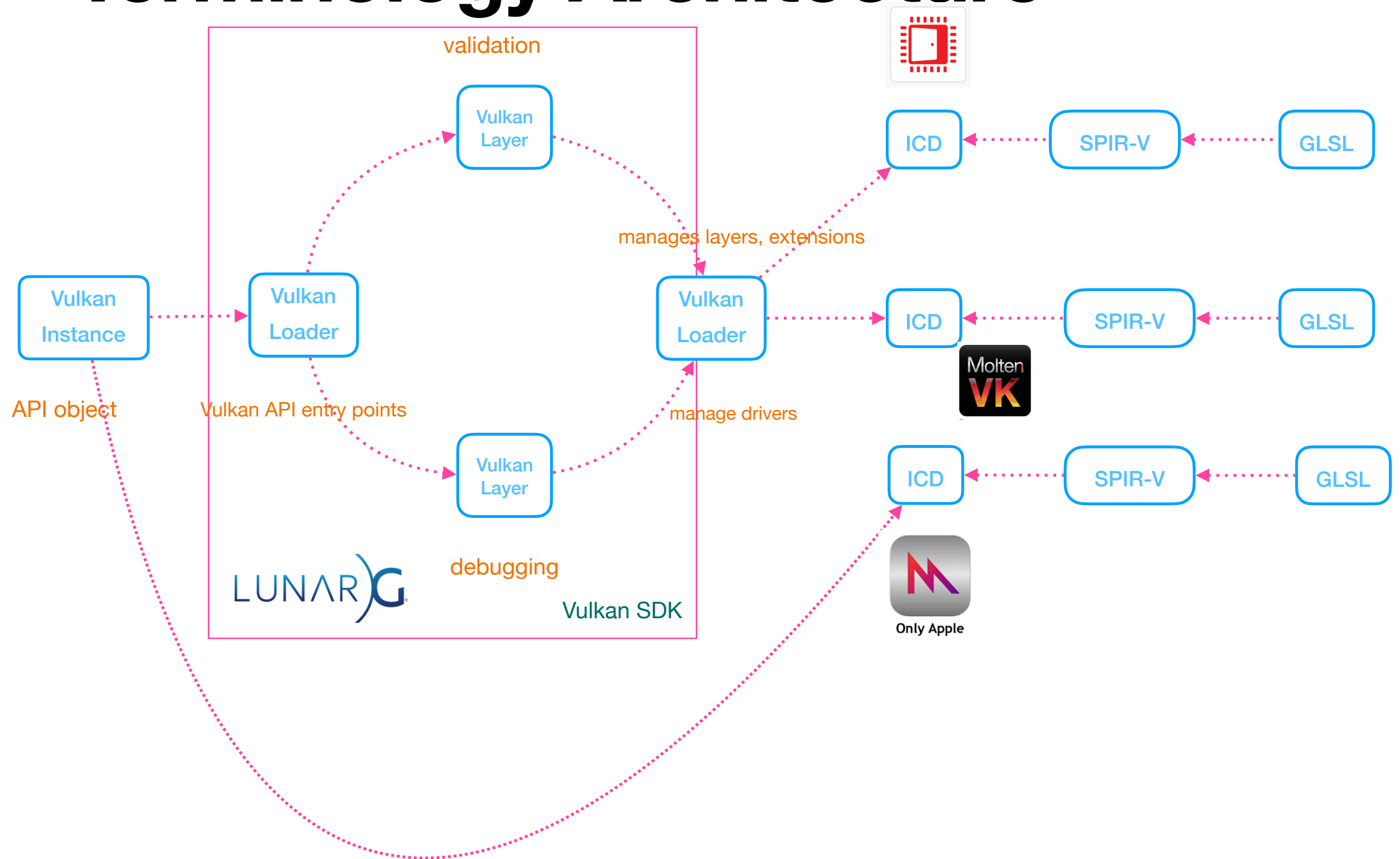
4. How to use MoltenVK?

1. Link directly to the MoltenVK static or dynamic library
 1. You can direct access to the Vulkan API
 2. It is not practical if you wish to maintain portability of your Vulkan rendering code across platforms
 3. You will sacrifice the ability to use the Vulkan validation layers
 4. However, **this is the only way to use MoltenVK on mobile devices.**
 5. On mobile devices, XCFramework is provided as a static library that can be linked directly to your application.
2. Use MoltenVK dynamic library in conjunction with the Vulkan loader.
 1. **This is generally used on desktop applications**
 2. In this mode, you link only to the Vulkan loader, and not the MoltenVK library directly.
 3. You will include the MoltenVK and the Vulkan Loader dynamic libraries in your application bundle when distributing your software.
 4. Use Vulkan loader and Vulkan validation layers instead of linked to the static MoltenVK library, why?
 1. You can debugging your Vulkan rendering code by using tremendous boon

Terminology

Term	Description
ICD	Installable Client Driver, on desktop side, the MoltenVK take this role
GLSL	OpenGL Shader Language
Vulkan Instance	The Vulkan API object that stores all per-application states
Vulkan Layer	A library designed to work as a plug-in for the loader. Provide validation and debugging functionality to applications
Vulkan Loader	A library 1. implements the Vulkan API entry points and 2. manages layers, extensions, and drivers It is found in the independent hardware vendor driver installs
SPIR-V	Standard Portable Intermediate Representation A cross-API intermediate language(IL) represents parallel compute and graphics programs

Terminology Architecture



Developing Vulkan Application for macOS

5. Vulkan SDK includes a MoltenVK runtime library for macOS
6. How to integrate the MoltenVK runtime library into a game or application?
 1. https://github.com/KhronosGroup/MoltenVK/blob/master/Docs/MoltenVK_Runtime_UserGuide.md

Use of the Vulkan SDK

SDK Versioning

7. SDK version: v.w.xx.0

1. “v” Vulkan major version
2. “w” Vulkan minor version
3. ‘xx’ vulkan patch version

8. Vulkan SDK and Vulkan Application must be matched.

9. Vulkan Instance Version.

1. This is the version of Vulkan loader, run vulkaninfo to see the version

10. Physical device has apiVersion, run vulkaninfo to see the version

Install the SDK

11. Download the SDK

1. <https://vulkan.lunarg.com/sdk/home>

12. What happened when Installing the SDK?

1. Mounting a disk image file
2. Double-click the InstallVulkan icon to start the installer
3. Choose the destination folder to install the Vulkan SDK
4. **Update the Vulkan Loader and MoltenVK libraries in /usr/local**
5. **Optional components be automatically downloaded** from the cloud and installed them as part of the SDK.
 1. Com.lunarg.vulkan.usr
 1. Copy loader, icd, and tools into system wide /usr/ locations
 2. com.lunarg.vulkan.sdl2
 1. SDL2 both 32/64-bit library
 3. com.lunarg.vulkan.glm
 1. GLM (3D Math Library) headers
 4. com.lunarg.vulkan.volk
 1. Volk(Vulkan Meta Loader) library
 5. Com.lunarg.vulkan.vma
 1. Vulkan Memory Allocator library.

13. Install from command line

1. `sudo ./InstallVulkan.app/Contents/MacOS/InstallVulkan --root "installation path" --accept-licenses --default-answer --confirm-command install`
2. `Sudo .install_vulkan.py`

14. Uninstall from the command line

1. `sudo ./MaintenanceTool.app/Contents/MacOS/MaintenanceTool --confirm-command purge`
2. `Sudo ./uninstall.sh`

SDK System Paths

15.SDK system paths is : /usr/local

1. Vulkan installer program will copy following items to /usr/local:
 1. Loader
 2. Command line tools
 3. MoltenVK ICD
2. If you install Vulkan SDK through cmd line, then you need to set PATH, DYLD_LIBRARY_PATH, VK_LAYER_PATH, and VK_ICD_FILENAMES environments.