

VRE::VRE\_Window

- int mWidth  
 - int mHeight  
 - bool mFrameBufferResized  
 - const std::string mWindowName  
 - GLFWwindow \* mWindow

+ VRE\_Window(int width, int height, std::string name)  
 + ~VRE\_Window()  
 + VRE\_Window(const VRE\_Window &)=delete  
 + VRE\_Window & operator=(const VRE\_Window &)=delete  
 + bool ShouldClose()  
 + void CreateWindowSurface(VkInstance instance, VkSurfaceKHR \*surface)  
 + VkExtent2D GetExtent()  
 + bool HasWindowResized()  
 + void ResetWindowResizedFlag()  
 + GLFWwindow \* GetGLFWwindow() const  
 - void Init()  
 - static void FrameBufferResizedCallback(GLFWwindow \*window, int width, int height)

-mWindow

VRE::VRE\_Device

+ const bool mEnableValidationLayers  
 + VkPhysicalDeviceProperties mProperties  
 - VkInstance mInstance  
 - VkDebugUtilsMessengerEXT mDebugMessenger  
 - VkPhysicalDevice mPhysicalDevice  
 - VkCommandPool mCommandPool  
 - VkDevice mVkDevice  
 - VkSurfaceKHR mVkSurface  
 - VkQueue mGraphicsQueue  
 - VkQueue mPresentQueue  
 - const std::vector<const char \* > mValidationLayers  
 - const std::vector<const char \* > mDeviceExtensions

+ VRE\_Device(VRE\_Window &window)  
 + ~VRE\_Device()  
 + VRE\_Device(const VRE\_Device &)=delete  
 + VRE\_Device & operator=(const VRE\_Device &)=delete  
 + VRE\_Device(VRE\_Device &&)=delete  
 + VRE\_Device & operator=(VRE\_Device &&)=delete  
 + VkCommandPool GetCommandPool()  
 + VkDevice GetVkDevice()  
 + VkPhysicalDevice GetPhysicalDevice()  
 + VkSurfaceKHR Surface() and 12 more...  
 - void CreateInstance()  
 - void SetupDebugMessenger()  
 - void CreateSurface()  
 - void PickPhysicalDevice()  
 - void CreateLogicalDevice()  
 - void CreateCommandPool()  
 - bool IsDeviceSuitable(VkPhysicalDevice device)  
 - std::vector<const char \* > GetRequiredExtensions()  
 - bool CheckValidationLayerSupport()  
 - QueueFamilyIndices FindQueueFamilies(VkPhysicalDevice device)  
 - void PopulateDebugMessengerCreateInfo(VkDebugUtilsMessengerCreateInfoEXT &createInfo)  
 - void HasGlfwRequiredInstanceExtensions()  
 - bool CheckDeviceExtensionSupport(VkPhysicalDevice device)  
 - SwapChainSupportDetails QuerySwapChainSupport(VkPhysicalDevice device)

-mWindow

-mDevice

VRE::VRE\_Renderer

- std::unique\_ptr< VRE\_SwapChain > mSwapChain  
 - std::vector< VkCommandBuffer > mCommandBuffers  
 - uint32\_t mCurrentImageIndex  
 - int mCurrentFrameIndex  
 - bool mDrawStarted

+ VRE\_Renderer(VRE\_Window &window, VRE\_Device &device)  
 + ~VRE\_Renderer()  
 + VRE\_Renderer(const VRE\_Renderer &)=delete  
 + VRE\_Renderer & operator=(const VRE\_Renderer &)=delete  
 + VkCommandBuffer BeginDraw()  
 + void EndDraw()  
 + void BeginSwapChainRenderPass(VkCommandBuffer commandBuffer)  
 + void EndSwapChainRenderPass(VkCommandBuffer commandBuffer)  
 + bool IsDrawInProgress() const  
 + VkRenderPass GetSwapChainRenderPass() const  
 + float GetAspectRatio() const  
 + VkCommandBuffer GetCurrentCommandBuffer() const  
 + int GetFrameIndex() const  
 - void CreateCommandBuffers()  
 - void RecreateSwapChain()  
 - void FreeCommandBuffers()