vengine

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Chapter 1

Hierarchical Index

1.1 Class Hierarchy

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Chapter 2

Class Index

2.1 Class List

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Chapter 3

Class Documentation

3.1 ven::Buffer Class Reference

Public Member Functions

- **Buffer** (Device &device, VkDeviceSize instanceSize, uint32_t instanceCount, VkBufferUsageFlags usage↩ Flags, VkMemoryPropertyFlags memoryPropertyFlags, VkDeviceSize minOffsetAlignment=1)
- **Buffer** (const Buffer &)=delete
- Buffer & **operator=** (const Buffer &)=delete
- VkResult map (VkDeviceSize size=VK_WHOLE_SIZE, VkDeviceSize offset=0)
- void unmap ()
- void writeToBuffer (void ∗data, VkDeviceSize size=VK_WHOLE_SIZE, VkDeviceSize offset=0)
- VkResult flush (VkDeviceSize size=VK_WHOLE_SIZE, VkDeviceSize offset=0)
- VkDescriptorBufferInfo descriptorInfo (VkDeviceSize size=VK_WHOLE_SIZE, VkDeviceSize offset=0)
- VkResult invalidate (VkDeviceSize size=VK_WHOLE_SIZE, VkDeviceSize offset=0)
- void writeToIndex (void ∗data, int index)
- VkResult flushIndex (int index)
- VkDescriptorBufferInfo descriptorInfoForIndex (int index)
- VkResult invalidateIndex (int index)
- VkBuffer **getBuffer** () const
- void ∗ **getMappedMemory** () const
- uint32_t **getInstanceCount** () const
- VkDeviceSize **getInstanceSize** () const
- VkDeviceSize **getAlignmentSize** () const
- VkBufferUsageFlags **getUsageFlags** () const
- VkMemoryPropertyFlags **getMemoryPropertyFlags** () const
- VkDeviceSize **getBufferSize** () const

3.1.1 Member Function Documentation

3.1.1.1 descriptorInfo()

```
VkDescriptorBufferInfo ven::Buffer::descriptorInfo (
            VkDeviceSize size = VK_WHOLE_SIZE,
            VkDeviceSize offset = 0 )  [inline]
```

Create a buffer info descriptor

Parameters

size	(Optional) Size of the memory range of the descriptor
offset	(Optional) Byte offset from beginning

Returns

VkDescriptorBufferInfo of specified offset and range

3.1.1.2 descriptorInfoForIndex()

```
VkDescriptorBufferInfo ven::Buffer::descriptorInfoForIndex (
            int index )  [inline]
```

Create a buffer info descriptor

Parameters

index	Specifies the region given by index ∗ alignmentSize

Returns

VkDescriptorBufferInfo for instance at index

3.1.1.3 flush()

```
VkResult ven::Buffer::flush (
            VkDeviceSize size = VK_WHOLE_SIZE,
            VkDeviceSize offset = 0 )
```

Flush a memory range of the buffer to make it visible to the device

Note

Only required for non-coherent memory

Parameters

size	(Optional) Size of the memory range to flush. Pass VK_WHOLE_SIZE to flush the complete buffer range.
offset	(Optional) Byte offset from beginning

Returns

VkResult of the flush call

3.1.1.4 flushIndex()

```
VkResult ven::Buffer::flushIndex (
            int index )  [inline]
```

Flush the memory range at index ∗ alignmentSize of the buffer to make it visible to the device

Parameters

index	Used in offset calculation

3.1.1.5 invalidate()

```
VkResult ven::Buffer::invalidate (
            VkDeviceSize size = VK_WHOLE_SIZE,
            VkDeviceSize offset = 0 )
```

Invalidate a memory range of the buffer to make it visible to the host

Note

Only required for non-coherent memory

Parameters

size	(Optional) Size of the memory range to invalidate. Pass VK_WHOLE_SIZE to invalidate the complete buffer range.
offset	(Optional) Byte offset from beginning

Returns

VkResult of the invalidate call

3.1.1.6 invalidateIndex()

```
VkResult ven::Buffer::invalidateIndex (
            int index )  [inline]
```

Invalidate a memory range of the buffer to make it visible to the host

Note

Only required for non-coherent memory

Parameters

index	Specifies the region to invalidate: index ∗ alignmentSize

Returns

VkResult of the invalidate call

3.1.1.7 map()

```
VkResult ven::Buffer::map (
            VkDeviceSize size = VK_WHOLE_SIZE,
            VkDeviceSize offset = 0 )
```

Map a memory range of this buffer. If successful, mapped points to the specified buffer range.

Parameters

size	(Optional) Size of the memory range to map. Pass VK_WHOLE_SIZE to map the complete buffer range.
offset	(Optional) Byte offset from beginning

Returns

VkResult of the buffer mapping call

3.1.1.8 unmap()

```
void ven::Buffer::unmap ( )
```

Unmap a mapped memory range

Note

Does not return a result as vkUnmapMemory can't fail

3.1.1.9 writeToBuffer()

```
void ven::Buffer::writeToBuffer (
            void * data,
            VkDeviceSize size = VK_WHOLE_SIZE,
            VkDeviceSize offset = 0 )
```

Copies the specified data to the mapped buffer. Default value writes whole buffer range

Parameters

data	Pointer to the data to copy
size	(Optional) Size of the data to copy. Pass VK_WHOLE_SIZE to flush the complete buffer range.
offset	(Optional) Byte offset from beginning of mapped region

3.1.1.10 writeToIndex()

```
void ven::Buffer::writeToIndex (
            void * data,
            int index )  [inline]
```

Copies "instanceSize" bytes of data to the mapped buffer at an offset of index * alignmentSize

Parameters

data	Pointer to the data to copy
index	Used in offset calculation

The documentation for this class was generated from the following file:

- include/VEngine/Buffer.hpp

3.2 ven::DescriptorPool::Builder Class Reference

Public Member Functions

- **Builder** (Device &device)
- Builder & **addPoolSize** (VkDescriptorType descriptorType, uint32_t count)
- Builder & **setPoolFlags** (VkDescriptorPoolCreateFlags flags)
- Builder & **setMaxSets** (uint32_t count)
- std::unique_ptr< DescriptorPool > **build** () const

The documentation for this class was generated from the following file:

- include/VEngine/Descriptors.hpp

3.3 ven::DescriptorSetLayout::Builder Class Reference

Public Member Functions

- **Builder** (Device &device)
- Builder & **addBinding** (uint32_t binding, VkDescriptorType descriptorType, VkShaderStageFlags stage↩ Flags, uint32_t count=1)
- std::unique_ptr< DescriptorSetLayout > **build** () const

The documentation for this class was generated from the following file:

- include/VEngine/Descriptors.hpp

3.4 ven::Model::Builder Struct Reference

Public Member Functions

- void **loadModel** (const std::string &filename)

Public Attributes

- std::vector< Vertex > **vertices** {}
- std::vector< uint32_t > **indices** {}

The documentation for this struct was generated from the following file:

- include/VEngine/Model.hpp

3.5 ven::Camera Class Reference

Public Member Functions

- void **setOrthographicProjection** (float left, float right, float top, float bottom, float near, float far)
- void **setPerspectiveProjection** (float fovy, float aspect, float near, float far)
- void **setViewDirection** (glm::vec3 position, glm::vec3 direction, glm::vec3 up=glm::vec3{0.F, -1.F, 0.F})
- void **setViewTarget** (glm::vec3 position, glm::vec3 target, glm::vec3 up=glm::vec3{0.F, -1.F, 0.F})
- void **setViewYXZ** (glm::vec3 position, glm::vec3 rotation)
- const glm::mat4 & **getProjection** () const
- const glm::mat4 & **getView** () const

The documentation for this class was generated from the following file:

- include/VEngine/Camera.hpp

3.6 myLib::Clock Class Reference

Public Member Functions

- void **restart** ()
- void **pause** ()
- void **resume** ()
- Time **getElapsedTime** () const

The documentation for this class was generated from the following file:

- lib/static/myLib/include/myLib/Clock/Clock.hpp

3.7 ven::DescriptorPool Class Reference

Classes

- class Builder

Public Member Functions

- **DescriptorPool** (Device &device, uint32_t maxSets, VkDescriptorPoolCreateFlags poolFlags, const std::vector< VkDescriptorPoolSize > &poolSizes)
- **DescriptorPool** (const DescriptorPool &)=delete
- DescriptorPool & **operator=** (const DescriptorPool &)=delete
- bool **allocateDescriptor** (const VkDescriptorSetLayout descriptorSetLayout, VkDescriptorSet &descriptor) const
- void **freeDescriptors** (std::vector< VkDescriptorSet > &descriptors) const
- void **resetPool** ()

Friends

- class **DescriptorWriter**

The documentation for this class was generated from the following file:

- include/VEngine/Descriptors.hpp

3.8 ven::DescriptorSetLayout Class Reference

Classes

- class Builder

Public Member Functions

- **DescriptorSetLayout** (Device &device, std::unordered_map< uint32_t, VkDescriptorSetLayoutBinding > bindings)
- **DescriptorSetLayout** (const DescriptorSetLayout &)=delete
- DescriptorSetLayout & **operator=** (const DescriptorSetLayout &)=delete
- VkDescriptorSetLayout **getDescriptorSetLayout** () const

Friends

- class **DescriptorWriter**

The documentation for this class was generated from the following file:

- include/VEngine/Descriptors.hpp

3.9 ven::DescriptorWriter Class Reference

Public Member Functions

- **DescriptorWriter** (DescriptorSetLayout &setLayout, DescriptorPool &pool)
- DescriptorWriter & **writeBuffer** (uint32_t binding, VkDescriptorBufferInfo *bufferInfo)
- DescriptorWriter & **writeImage** (uint32_t binding, VkDescriptorImageInfo *imageInfo)
- bool **build** (VkDescriptorSet &set)
- void **overwrite** (VkDescriptorSet &set)

The documentation for this class was generated from the following file:

- include/VEngine/Descriptors.hpp

3.10 ven::Device Class Reference

Public Member Functions

- **Device** (ven::Window &window)
- **Device** (const Device &)=delete
- Device & **operator=** (const Device &)=delete
- **Device** (Device &&)=delete
- Device & **operator=** (Device &&)=delete
- VkCommandPool **getCommandPool** ()
- VkDevice **device** ()
- VkSurfaceKHR **surface** ()
- VkQueue **graphicsQueue** ()
- VkQueue **presentQueue** ()
- SwapChainSupportDetails **getSwapChainSupport** ()
- uint32_t **findMemoryType** (uint32_t typeFilter, VkMemoryPropertyFlags properties)
- QueueFamilyIndices **findPhysicalQueueFamilies** ()
- VkFormat **findSupportedFormat** (const std::vector< VkFormat > &candidates, VkImageTiling tiling, VkFormatFeatureFlags features)
- void **createBuffer** (VkDeviceSize size, VkBufferUsageFlags usage, VkMemoryPropertyFlags properties, VkBuffer &buffer, VkDeviceMemory &bufferMemory)
- VkCommandBuffer **beginSingleTimeCommands** ()
- void **endSingleTimeCommands** (VkCommandBuffer commandBuffer)
- void **copyBuffer** (VkBuffer srcBuffer, VkBuffer dstBuffer, VkDeviceSize size)
- void **copyBufferToImage** (VkBuffer buffer, VkImage image, uint32_t width, uint32_t height, uint32_t layerCount)
- void **createImageWithInfo** (const VkImageCreateInfo &imageInfo, VkMemoryPropertyFlags properties, VkImage &image, VkDeviceMemory &imageMemory)

Public Attributes

- const bool **enableValidationLayers** = true
- VkPhysicalDeviceProperties **m_properties**

The documentation for this class was generated from the following file:

- include/VEngine/Device.hpp

3.11 ven::Engine Class Reference

Public Member Functions

- **Engine** (uint32_t=DEFAULT_WIDTH, uint32_t=DEFAULT_HEIGHT, const std::string &title=DEFAULT_↩ TITLE.data())
- **Engine** (const Engine &)=delete
- Engine **operator=** (const Engine &)=delete
- Window & **getWindow** ()
- void **mainLoop** ()

The documentation for this class was generated from the following file:

- include/VEngine/Engine.hpp

3.12 ven::FrameInfo Struct Reference

Public Attributes

- int **frameIndex**
- float **frameTime**
- VkCommandBuffer **commandBuffer**
- Camera & **camera**
- VkDescriptorSet **globalDescriptorSet**

The documentation for this struct was generated from the following file:

- include/VEngine/FrameInfo.hpp

3.13 ven::KeyboardController Class Reference

Classes

- struct KeyMappings

Public Member Functions

- void **moveInPlaneXZ** (GLFWwindow ∗window, float dt, Object &object) const

Public Attributes

- KeyMappings **m_keys** {}
- float **m_moveSpeed** {3.F}
- float **m_lookSpeed** {1.5F}

The documentation for this class was generated from the following file:

- include/VEngine/KeyboardController.hpp

3.14 ven::KeyboardController::KeyMappings Struct Reference

Public Attributes

- int **moveLeft** = GLFW_KEY_A
- int **moveRight** = GLFW_KEY_D
- int **moveForward** = GLFW_KEY_W
- int **moveBackward** = GLFW_KEY_S
- int **moveUp** = GLFW_KEY_SPACE
- int **moveDown** = GLFW_KEY_LEFT_SHIFT
- int **lookLeft** = GLFW_KEY_LEFT
- int **lookRight** = GLFW_KEY_RIGHT
- int **lookUp** = GLFW_KEY_UP
- int **lookDown** = GLFW_KEY_DOWN

The documentation for this struct was generated from the following file:

- include/VEngine/KeyboardController.hpp

3.15 ven::Model Class Reference

Classes

- struct Builder
- struct Vertex

Public Member Functions

- **Model** (Device &device, const Model::Builder &builder)
- **Model** (const Model &)=delete
- void **operator=** (const Model &)=delete
- void **bind** (VkCommandBuffer commandBuffer)
- void **draw** (VkCommandBuffer commandBuffer) const

Static Public Member Functions

- static std::unique_ptr< Model > **createModelFromFile** (Device &device, const std::string &filename)

The documentation for this class was generated from the following file:

- include/VEngine/Model.hpp

3.16 ven::Object Class Reference

Public Member Functions

- **Object** (const Object &)=delete
- Object & **operator=** (const Object &)=delete
- **Object** (Object &&)=default
- Object & **operator=** (Object &&)=default
- id_t **getId** () const

Static Public Member Functions

- static Object **createObject** ()

Public Attributes

- std::shared_ptr< ven::Model > **model** {}
- glm::vec3 **color** {}
- Transform3DComponent **transform3D** {}

The documentation for this class was generated from the following file:

- include/VEngine/Object.hpp

3.17 ven::PipelineConfigInfo Struct Reference

Public Member Functions

- **PipelineConfigInfo** (const PipelineConfigInfo &)=delete
- PipelineConfigInfo & **operator=** (const PipelineConfigInfo &)=delete

Public Attributes

- VkPipelineInputAssemblyStateCreateInfo **inputAssemblyInfo** {}
- VkPipelineRasterizationStateCreateInfo **rasterizationInfo** {}
- VkPipelineMultisampleStateCreateInfo **multisampleInfo** {}
- VkPipelineColorBlendAttachmentState **colorBlendAttachment** {}
- VkPipelineColorBlendStateCreateInfo **colorBlendInfo** {}
- VkPipelineDepthStencilStateCreateInfo **depthStencilInfo** {}
- std::vector< VkDynamicState > **dynamicStateEnables**
- VkPipelineDynamicStateCreateInfo **dynamicStateInfo** {}
- VkPipelineLayout **pipelineLayout** = nullptr
- VkRenderPass **renderPass** = nullptr
- uint32_t **subpass** = 0

The documentation for this struct was generated from the following file:

- include/VEngine/Shaders.hpp

3.18 gui::PluginLoader Class Reference

Classes

- class PluginLoaderException

Public Types

- using **PluginCreator** = std::unique_ptr< IPlugin >(*)()

Public Member Functions

- template<typename T >
  std::unique_ptr< T > **getPlugin** (const std::string &pluginName)
- void **closePlugins** ()

Static Public Member Functions

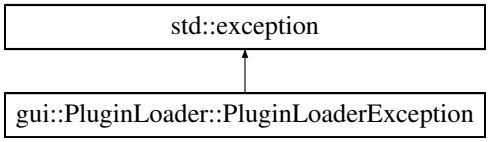
- static PluginLoader & **getInstance** ()

The documentation for this class was generated from the following file:

- include/VEngine/PluginLoader.hpp

3.19 gui::PluginLoader::PluginLoaderException Class Reference

Inheritance diagram for gui::PluginLoader::PluginLoaderException:



Public Member Functions

- **PluginLoaderException** (std::string msg)
- const char * **what** () const noexcept override

The documentation for this class was generated from the following file:

- include/VEngine/PluginLoader.hpp

3.20 ven::QueueFamilyIndices Struct Reference

Public Member Functions

- bool **isComplete** () const

Public Attributes

- uint32_t **graphicsFamily** {}
- uint32_t **presentFamily** {}
- bool **graphicsFamilyHasValue** = false
- bool **presentFamilyHasValue** = false

The documentation for this struct was generated from the following file:

- include/VEngine/Device.hpp

3.21 myLib::Random Class Reference

Static Public Member Functions

- static int **randomInt** (int min, int max)
- static int **randomInt** ()
- static float **randomFloat** (float min, float max)
- static float **randomFloat** ()

The documentation for this class was generated from the following file:

- lib/static/myLib/include/myLib/Random.hpp

3.22 ven::Renderer Class Reference

Public Member Functions

- **Renderer** (Window &window, Device &device)
- **Renderer** (const Renderer &)=delete
- Renderer & **operator=** (const Renderer &)=delete
- VkRenderPass **getSwapChainRenderPass** () const
- float **getAspectRatio** () const
- bool **isFrameInProgress** () const
- VkCommandBuffer **getCurrentCommandBuffer** () const
- int **getFrameIndex** () const
- VkCommandBuffer **beginFrame** ()
- void **endFrame** ()
- void **beginSwapChainRenderPass** (VkCommandBuffer commandBuffer)

Static Public Member Functions

- static void **endSwapChainRenderPass** (VkCommandBuffer commandBuffer)

The documentation for this class was generated from the following file:

- include/VEngine/Renderer.hpp

3.23 ven::RenderSystem Class Reference

Public Member Functions

- **RenderSystem** (Device &device, VkRenderPass renderPass, VkDescriptorSetLayout globalSetLayout)
- **RenderSystem** (const RenderSystem &)=delete
- RenderSystem & **operator=** (const RenderSystem &)=delete
- void **renderObjects** (FrameInfo &frameInfo, std::vector< ven::Object > &objects)

The documentation for this class was generated from the following file:

- include/VEngine/RenderSystem.hpp

3.24 ven::Shaders Class Reference

Public Member Functions

- **Shaders** (Device &device, const std::string &vertFilepath, const std::string &fragFilepath, const PipelineConfigInfo &configInfo)
- **Shaders** (const Shaders &)=delete
- Shaders & **operator=** (const Shaders &)=delete
- void **bind** (VkCommandBuffer commandBuffer)

Static Public Member Functions

- static void **defaultPipelineConfigInfo** (PipelineConfigInfo &configInfo)

The documentation for this class was generated from the following file:

- include/VEngine/Shaders.hpp

3.25 ven::SimplePushConstantData Struct Reference

Public Attributes

- glm::mat4 **modelMatrix** {1.F}
- glm::mat4 **normalMatrix** {1.F}

The documentation for this struct was generated from the following file:

- include/VEngine/RenderSystem.hpp

3.26 ven::SwapChain Class Reference

Public Member Functions

- **SwapChain** (Device &deviceRef, VkExtent2D windowExtent)
- **SwapChain** (Device &deviceRef, VkExtent2D windowExtent, std::shared_ptr< SwapChain > previous)
- **SwapChain** (const SwapChain &)=delete
- SwapChain & **operator=** (const SwapChain &)=delete
- VkFramebuffer **getFrameBuffer** (unsigned long index)
- VkRenderPass **getRenderPass** ()
- VkImageView **getImageView** (int index)
- size_t **imageCount** ()
- VkFormat **getSwapChainImageFormat** ()
- VkExtent2D **getSwapChainExtent** ()
- uint32_t **width** () const
- uint32_t **height** () const
- float **extentAspectRatio** () const
- VkFormat **findDepthFormat** ()
- VkResult **acquireNextImage** (uint32_t *imageIndex)
- VkResult **submitCommandBuffers** (const VkCommandBuffer *buffers, const uint32_t *imageIndex)
- bool **compareSwapFormats** (const SwapChain &swapChainp) const

Static Public Attributes

- static constexpr int **MAX_FRAMES_IN_FLIGHT** = 2

The documentation for this class was generated from the following file:

- include/VEngine/SwapChain.hpp

3.27 ven::SwapChainSupportDetails Struct Reference

Public Attributes

- VkSurfaceCapabilitiesKHR **capabilities**
- std::vector< VkSurfaceFormatKHR > **formats**
- std::vector< VkPresentModeKHR > **presentModes**

The documentation for this struct was generated from the following file:

- include/VEngine/Device.hpp

3.28 myLib::Time Class Reference

Public Member Functions

- **Time** (const double seconds)
- int **asSeconds** () const
- int **asMilliseconds** () const
- int **asMicroseconds** () const

The documentation for this class was generated from the following file:

- lib/static/myLib/include/myLib/Clock/Time.hpp

3.29 ven::Transform3DComponent Struct Reference

Public Member Functions

- glm::mat4 **mat4** () const
- glm::mat3 **normalMatrix** ()

Public Attributes

- glm::vec3 **translation** {}
- glm::vec3 **scale** {1.F, 1.F, 1.F}
- glm::vec3 **rotation** {}

The documentation for this struct was generated from the following file:

- include/VEngine/Object.hpp

3.30 ven::Model::Vertex Struct Reference

Public Member Functions

- bool **operator==** (const Vertex &other) const

Static Public Member Functions

- static std::vector< VkVertexInputBindingDescription > **getBindingDescriptions** ()
- static std::vector< VkVertexInputAttributeDescription > **getAttributeDescriptions** ()

Public Attributes

- glm::vec3 **position** {}
- glm::vec3 **color** {}
- glm::vec3 **normal** {}
- glm::vec2 **uv** {}

The documentation for this struct was generated from the following file:

- include/VEngine/Model.hpp

3.31 ven::Window Class Reference

Public Member Functions

- **Window** (const uint32_t width, const uint32_t height, const std::string &title)
- GLFWwindow ∗ **createWindow** (uint32_t width, uint32_t height, const std::string &title)
- void **createWindowSurface** (VkInstance instance, VkSurfaceKHR ∗surface)
- GLFWwindow ∗ **getGLFWindow** () const
- VkExtent2D **getExtent** () const
- bool **wasWindowResized** () const
- void **resetWindowResizedFlag** ()

The documentation for this class was generated from the following file:

- include/VEngine/Window.hpp

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