

# Memory Barrier

```
typedef enum VkAccessFlagBits {  
    VK_ACCESS_INDIRECT_COMMAND_READ_BIT,  
    VK_ACCESS_INDEX_READ_BIT,  
    VK_ACCESS_VERTEX_ATTRIBUTE_READ_BIT ,  
    VK_ACCESS_UNIFORM_READ_BIT,  
    VK_ACCESS_INPUT_ATTACHMENT_READ_BIT,  
    VK_ACCESS_SHADER_READ_BIT,  
    VK_ACCESS_SHADER_WRITE_BIT,  
    VK_ACCESS_COLOR_ATTACHMENT_READ_BIT,  
    VK_ACCESS_COLOR_ATTACHMENT_WRITE_BIT,  
    VK_ACCESS_DEPTH_STENCIL_ATTACHMENT_READ_BIT,  
    VK_ACCESS_DEPTH_STENCIL_ATTACHMENT_WRITE_BIT,  
    VK_ACCESS_TRANSFER_READ_BIT,  
    VK_ACCESS_TRANSFER_WRITE_BIT,  
    VK_ACCESS_HOST_READ_BIT,  
    VK_ACCESS_HOST_WRITE_BIT,  
    VK_ACCESS_MEMORY_READ_BIT,  
    VK_ACCESS_MEMORY_WRITE_BIT,  
    ...  
} VkAccessFlagBits;
```

```
typedef enum VkImageLayout {  
    VK_IMAGE_LAYOUT_UNDEFINED,  
    VK_IMAGE_LAYOUT_GENERAL,  
    VK_IMAGE_LAYOUT_COLOR_ATTACHMENT_OPTIMAL,  
    VK_IMAGE_LAYOUT_DEPTH_STENCIL_ATTACHMENT_OPTIMAL,  
    VK_IMAGE_LAYOUT_DEPTH_STENCIL_READ_ONLY_OPTIMAL,  
    VK_IMAGE_LAYOUT_SHADER_READ_ONLY_OPTIMAL,  
    VK_IMAGE_LAYOUT_TRANSFER_SRC_OPTIMAL,  
    VK_IMAGE_LAYOUT_TRANSFER_DST_OPTIMAL,  
    VK_IMAGE_LAYOUT_PREINITIALIZED,  
    ...  
} VkImageLayout;
```

```
typedef enum  
VkPipelineStageFlagBits {  
    VK_PIPELINE_STAGE_TOP_OF_PIPE_BIT,  
    VK_PIPELINE_STAGE_DRAW_INDIRECT_BIT,  
    VK_PIPELINE_STAGE_VERTEX_INPUT_BIT,  
    VK_PIPELINE_STAGE_VERTEX_SHADER_BIT,  
    VK_PIPELINE_STAGE_TESSELLATION_CONTROL_SHADER_BIT,  
    VK_PIPELINE_STAGE_TESSELLATION_EVALUATION_SHADER_BIT,  
    VK_PIPELINE_STAGE_GEOMETRY_SHADER_BIT,  
    VK_PIPELINE_STAGE_FRAGMENT_SHADER_BIT,  
    VK_PIPELINE_STAGE_EARLY_FRAGMENT_TESTS_BIT,  
    VK_PIPELINE_STAGE_LATE_FRAGMENT_TESTS_BIT,  
    VK_PIPELINE_STAGE_COLOR_ATTACHMENT_OUTPUT_BIT,  
    VK_PIPELINE_STAGE_COMPUTE_SHADER_BIT,  
    VK_PIPELINE_STAGE_TRANSFER_BIT,  
    VK_PIPELINE_STAGE_BOTTOM_OF_PIPE_BIT,  
    VK_PIPELINE_STAGE_HOST_BIT,  
    VK_PIPELINE_STAGE_ALL_GRAPHICS_BIT,  
    VK_PIPELINE_STAGE_ALL_COMMANDS_BIT,  
    ...  
} VkPipelineStageFlagBits;
```

```
typedef enum VkDependencyFlagBits {  
    VK_DEPENDENCY_BY_REGION_BIT,  
    VK_DEPENDENCY_DEVICE_GROUP_BIT,  
    VK_DEPENDENCY_VIEW_LOCAL_BIT,  
    VK_DEPENDENCY_FEEDBACK_LOOP_BIT_EXT,  
    VK_DEPENDENCY_VIEW_LOCAL_BIT_KHR,  
    VK_DEPENDENCY_DEVICE_GROUP_BIT_KHR,  
} VkDependencyFlagBits;
```

```
VkMemoryBarrier  
sType = VK_STRUCTURE_TYPE_MEMORY_BARRIER;  
pNext = nullptr;  
srcAccessMask;  
dstAccessMask;
```

```
VkBufferMemoryBarrier  
sType = VK_STRUCTURE_TYPE_BUFFER_MEMORY_BARRIER;  
pNext = nullptr;  
srcAccessMask;  
dstAccessMask;  
srcQueueFamilyIndex;  
dstQueueFamilyIndex;  
buffer;  
offset;  
size;
```

```
enum VkImageAspectFlagBits  
VK_IMAGE_ASPECT_COLOR_BIT,  
VK_IMAGE_ASPECT_DEPTH_BIT,  
VK_IMAGE_ASPECT_STENCIL_BIT,  
VK_IMAGE_ASPECT_METADATA_BIT,  
VK_IMAGE_ASPECT_PLANE_0_BIT,  
VK_IMAGE_ASPECT_PLANE_1_BIT,  
VK_IMAGE_ASPECT_PLANE_2_BIT,  
VK_IMAGE_ASPECT_NONE,  
VK_IMAGE_ASPECT_MEMORY_PLANE_0_BIT_EXT,  
VK_IMAGE_ASPECT_MEMORY_PLANE_1_BIT_EXT,  
VK_IMAGE_ASPECT_MEMORY_PLANE_2_BIT_EXT,  
VK_IMAGE_ASPECT_MEMORY_PLANE_3_BIT_EXT,  
VK_IMAGE_ASPECT_PLANE_0_BIT_KHR,  
VK_IMAGE_ASPECT_PLANE_1_BIT_KHR,  
VK_IMAGE_ASPECT_PLANE_2_BIT_KHR,  
VK_IMAGE_ASPECT_NONE_KHR,
```

```
VkImageSubresourceRange  
aspectMask;  
baseMipLevel;  
levelCount;  
baseArrayLayer;  
layerCount;
```

```
VkImageMemoryBarrier  
sType = VK_STRUCTURE_TYPE_IMAGE_MEMORY_BARRIER;  
pNext = nullptr;  
srcAccessMask;  
dstAccessMask;  
oldLayout;  
newLayout;  
srcQueueFamilyIndex;  
dstQueueFamilyIndex;  
image;  
subresourceRange;
```

```
void vkCmdPipelineBarrier(  
    commandBuffer,  
    srcStageMask,  
    dstStageMask,  
    dependencyFlags,  
    memoryBarrierCount,  
    pMemoryBarriers,  
    bufferMemoryBarrierCount,  
    pBufferMemoryBarriers,  
    imageMemoryBarrierCount,  
    pImageMemoryBarriers  
);
```

VkBuffer

VkImage

VkCommandBuffer