Vulkan: Overall Block Diagram

Application

Instance

Instance

Physical Device

Physical Device

Physical Device

Logical Device

Logical Device

Logical Device

Logical Device

Queue

Queue

Queue

Queue

Queue

Queue

Queue

Command Buffer

Command Buffer

Command Buffer

Oregon State University

Computer Graphics
const char * myDeviceLayers[ ] =
{
    // "VK_LAYER_LUNARG_api_dump",
    // "VK_LAYER_LUNARG_core_validation",
    // "VK_LAYER_LUNARG_image",
    "VK_LAYER_LUNARG_object_tracker",
    // "VK_LAYER_LUNARG_parameter_validation",
    // "VK_LAYER_NV_optimus"
};

const char * myDeviceExtensions[ ] =
{
    "VK_KHR_surface",
    "VK_KHR_win32_surface",
    // "VK_KHR_swapchains"
};

// see what device layers are available:
uint32_t layerCount;
vkEnumerateDeviceLayerProperties(PhysicalDevice, &layerCount, (VkLayerProperties *)nullptr);
VkLayerProperties * deviceLayers = new VkLayerProperties[layerCount];
result = vkEnumerateDeviceLayerProperties( PhysicalDevice, &layerCount, deviceLayers);
Looking to See What Device Extensions are Available

```c
// see what device extensions are available:
uint32_t extensionCount;
vkEnumerateDeviceExtensionProperties(PhysicalDevice, deviceLayers[i].layerName,
   &extensionCount, (VkExtensionProperties *)nullptr);

VkExtensionProperties * deviceExtensions = new VkExtensionProperties[extensionCount];
result = vkEnumerateDeviceExtensionProperties(PhysicalDevice, deviceLayers[i].layerName,
   &extensionCount, deviceExtensions);
```

What Device Layers and Extensions are Available

4 physical device layers enumerated:

- 0x00401063 1 'VK_LAYER_NV_optimus' 'NVIDIA Optimus layer'
- 0x00401072 1 'VK_LAYER_LUNARG_core_validation' 'LunarG Validation Layer'
- 0x00401072 1 'VK_LAYER_LUNARG_object_tracker' 'LunarG Validation Layer'
- 0x00401072 1 'VK_LAYER_LUNARG_parameter_validation' 'LunarG Validation Layer'

0 device extensions enumerated for 'VK_LAYER_NV_optimus':

- 0x00000000 'VK_EXT_validation_cache'
- 0x00000004 'VK_EXT_debug_marker'

2 device extensions enumerated for 'VK_LAYER_LUNARG_core_validation':
- 0x00000001 'VK_EXT_validation_cache'
- 0x00000004 'VK_EXT_debug_marker'

2 device extensions enumerated for 'VK_LAYER_LUNARG_object_tracker':
- 0x00000001 'VK_EXT_validation_cache'
- 0x00000004 'VK_EXT_debug_marker'

2 device extensions enumerated for 'VK_LAYER_LUNARG_parameter_validation':
- 0x00000001 'VK_EXT_validation_cache'
- 0x00000004 'VK_EXT_debug_marker'
Vulkan: Creating a Logical Device

```c
float queuePriorities[1] = {
    1.0f,
};
VkDeviceQueueCreateInfo vdqci = {
    .sType = VK_STRUCTURE_TYPE_DEVICE_QUEUE_CREATE_INFO,
    .pNext = nullptr,
    .flags = 0,
    .queueFamilyIndex = 0,
    .queueCount = 1,
    .pQueueProperties = &queuePriorities[0],
};
result = vkCreateDevice( PhysicalDevice, &vdci, PALLOCATOR, &LogicalDevice );
```

Vulkan: Creating the Logical Device’s Queue

```c
// get the queue for this logical device:
vkGetDeviceQueue( LogicalDevice, 0, 0, &Queue );
```