

Cemu - Bug #534

Intel - Game corruption when display not in fullscreen

06/22/2021 05:56 PM - adamjer

Status:	New	Start date:	06/22/2021
Priority:	Normal		
Assignee:			
Category:			
API:	Vulkan	GPU Vendor/Model:	Intel all GPUs
Cemu Version:	1.23.0		

Description

We were able to confirm this problem with Breath of the Wild and Mario Kart 8.

The test renders immediately after layout transition from `VK_IMAGE_LAYOUT_UNDEFINED` what gives undefined results according to Vulkan specification:

`VK_IMAGE_LAYOUT_UNDEFINED` specifies that the layout is unknown. Image memory cannot be transitioned into this layout. This layout can be used as the `initialLayout` member of `VkImageCreateInfo`. This layout can be used in place of the current image layout in a layout transition, but doing so will cause the contents of the image's memory to be undefined

DEBUG ANALYSIS:

The affected image is a swapchain image at index 1. Operations performed on the image are as follows:

FRAME 0:

```
vkCmdPipelineBarrier(VK_IMAGE_LAYOUT_UNDEFINED --> VK_IMAGE_LAYOUT_TRANSFER_DST_OPTIMAL)
vkCmdCopyBufferToImage()
vkCmdPipelineBarrier(VK_IMAGE_LAYOUT_TRANSFER_DST_OPTIMAL --> VK_IMAGE_LAYOUT_PRESENT_SRC_KHR)
```

FRAME 1:

```
vkCmdPipelineBarrier(VK_IMAGE_LAYOUT_UNDEFINED --> VK_IMAGE_LAYOUT_TRANSFER_DST_OPTIMAL)
vkCmdClearColorImage()
vkCmdPipelineBarrier(VK_IMAGE_LAYOUT_TRANSFER_DST_OPTIMAL --> VK_IMAGE_LAYOUT_GENERAL)
vkCmdBeginRenderPass(initialLayout = VK_IMAGE_LAYOUT_UNDEFINED) // Transition from VK_IMAGE_LAYOUT_UNDEFINED
which corrupts the image
vkCmdDrawIndexed() // Rendering on top of corruptions.
vkCmdEndRenderPass(finalLayout = VK_IMAGE_LAYOUT_PRESENT_SRC_KHR)
vkCmdPipelineBarrier(VK_IMAGE_LAYOUT_COLOR_ATTACHMENT_OPTIMAL --> VK_IMAGE_LAYOUT_PRESENT_SRC_KHR)
vkCmdBeginRenderPass(initialLayout = VK_IMAGE_LAYOUT_PRESENT_SRC_KHR)
vkCmdEndRenderPass(finalLayout = VK_IMAGE_LAYOUT_PRESENT_SRC_KHR)
vkCmdPipelineBarrier(VK_IMAGE_LAYOUT_PRESENT_SRC_KHR --> VK_IMAGE_LAYOUT_TRANSFER_SRC_OPTIMAL)
vkCmdCopyImageToBuffer()
vkCmdPipelineBarrier(VK_IMAGE_LAYOUT_TRANSFER_SRC_OPTIMAL --> VK_IMAGE_LAYOUT_PRESENT_SRC_KHR)
```

To reproduce this issue Graphics Packs is needed.

Set graphics to 720p, desktop resolution to 800x600.

Corruptions:

<https://drive.google.com/file/d/1BlIj-v--SAbCIKk1EXO6vb6qXYsnW6uF/view?usp=sharing>