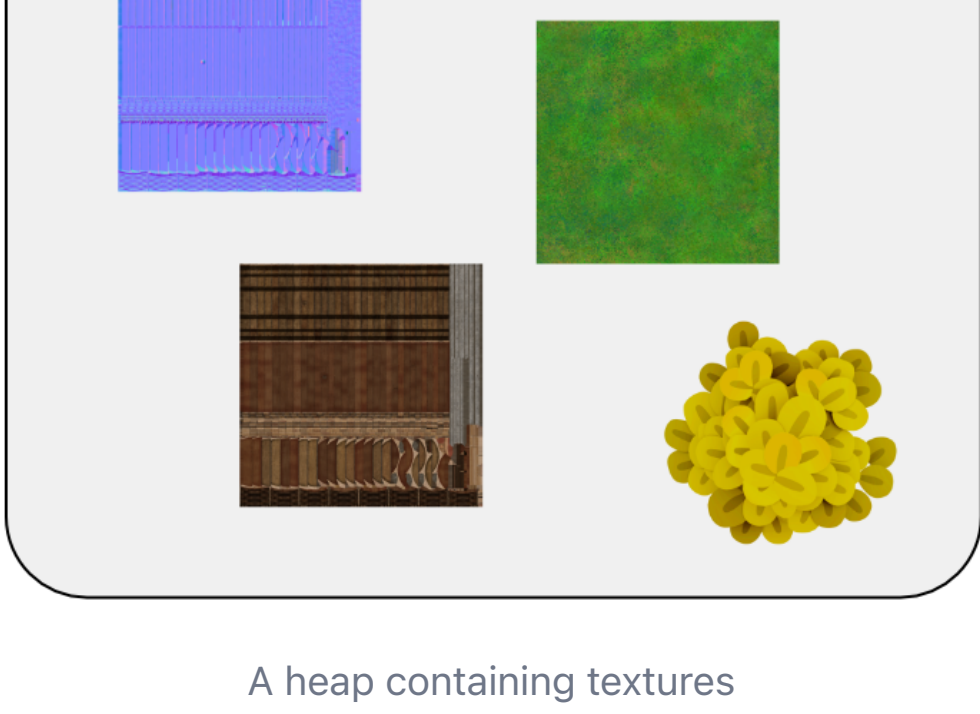


# 25 Managing Resources



An argument buffer containing resources

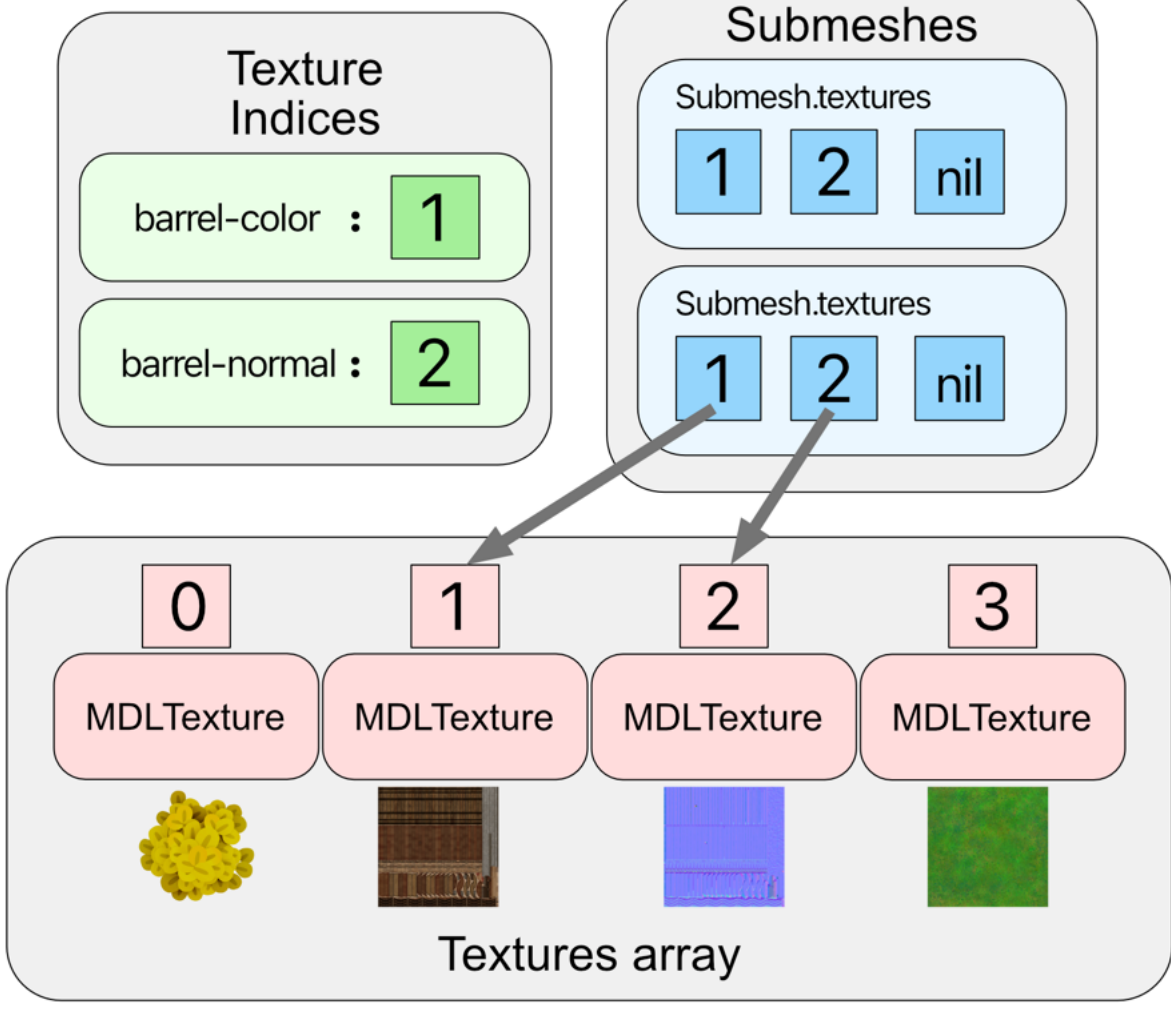


A heap containing textures

## The Starter Project



The starter app

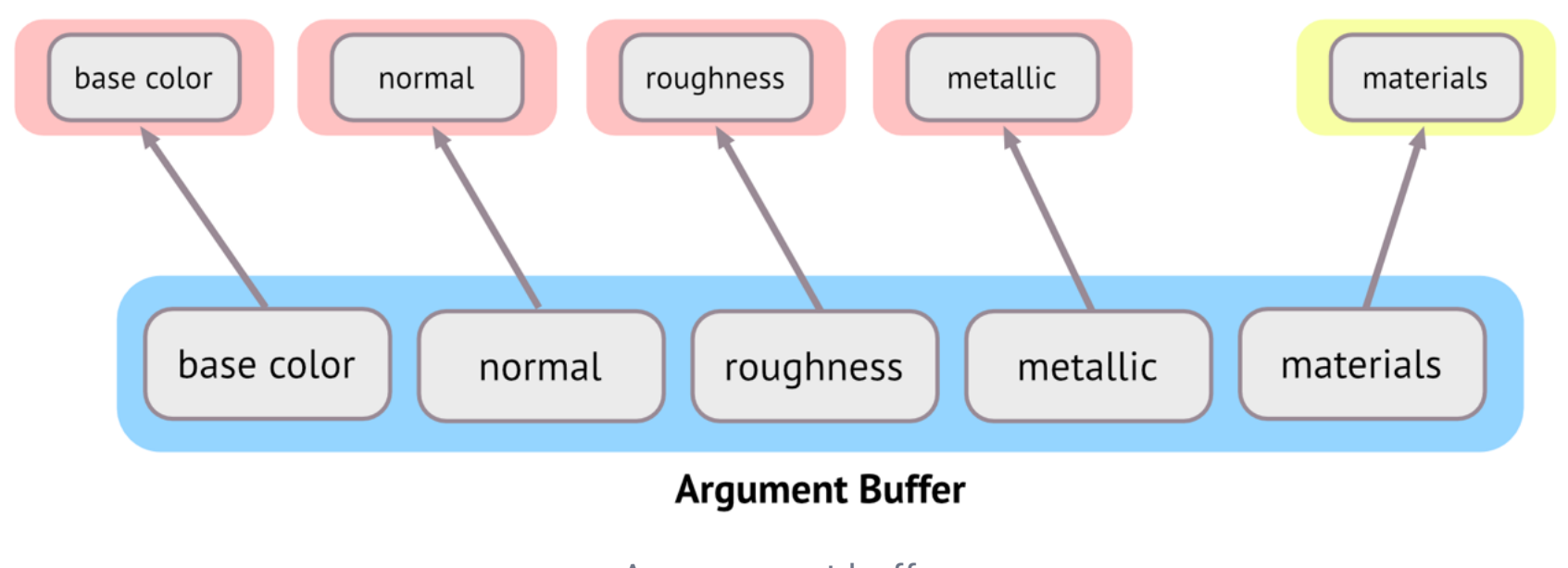


The texture controller

## Argument Buffers

```
barrel.usdz
> 736 [pushDebugGroup:"barrel.usdz"]
> 737 [setRenderPipelineState:0x1448d9200]
> 738 [setFragmentBytes:<data> length:48 atIndex:12]
> 739 [setVertexBytes:<data> length:368 atIndex:11]
> 740 [setVertexBuffer:0x146110600 offset:0 atIndex:0]
> 741 [setVertexBuffer:0x146110770 offset:0 atIndex:1]
> 742 [setVertexBuffer:0x146110c60 offset:0 atIndex:2]
> 743 [setVertexBuffer:0x146110dd0 offset:0 atIndex:3]
> 744 [setFragmentTexture:/Users/caroline/Library/Developer/Xcode
> 745 [setFragmentTexture:/Users/caroline/Library/Developer/Xcode
> 746 [setFragmentTexture:/Users/caroline/Library/Developer/Xcode
> 747 [setFragmentTexture:/Users/caroline/Library/Developer/Xcode
> 748 [setFragmentTexture:/Users/caroline/Library/Developer/Xcode
> 749 [setFragmentTexture:nil atIndex:5]
> 750 [setFragmentBytes:<data> length:32 atIndex:14]
> 751 [drawIndexedPrimitives:Triangle indexCount:672 indexTyp...
```

A barrel draw call

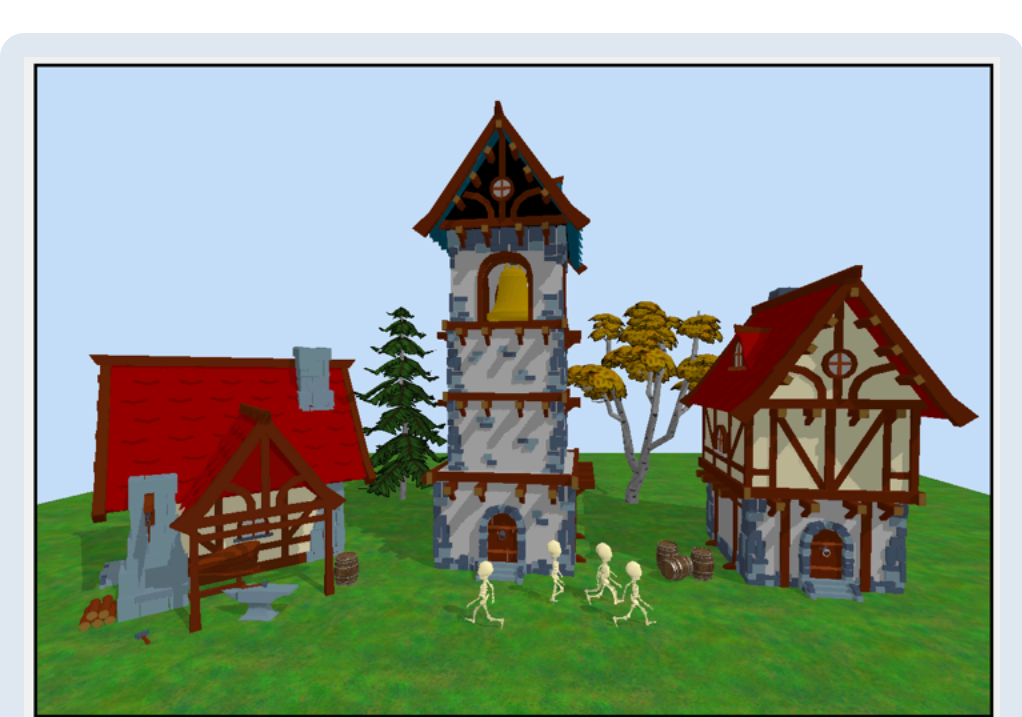


An argument buffer

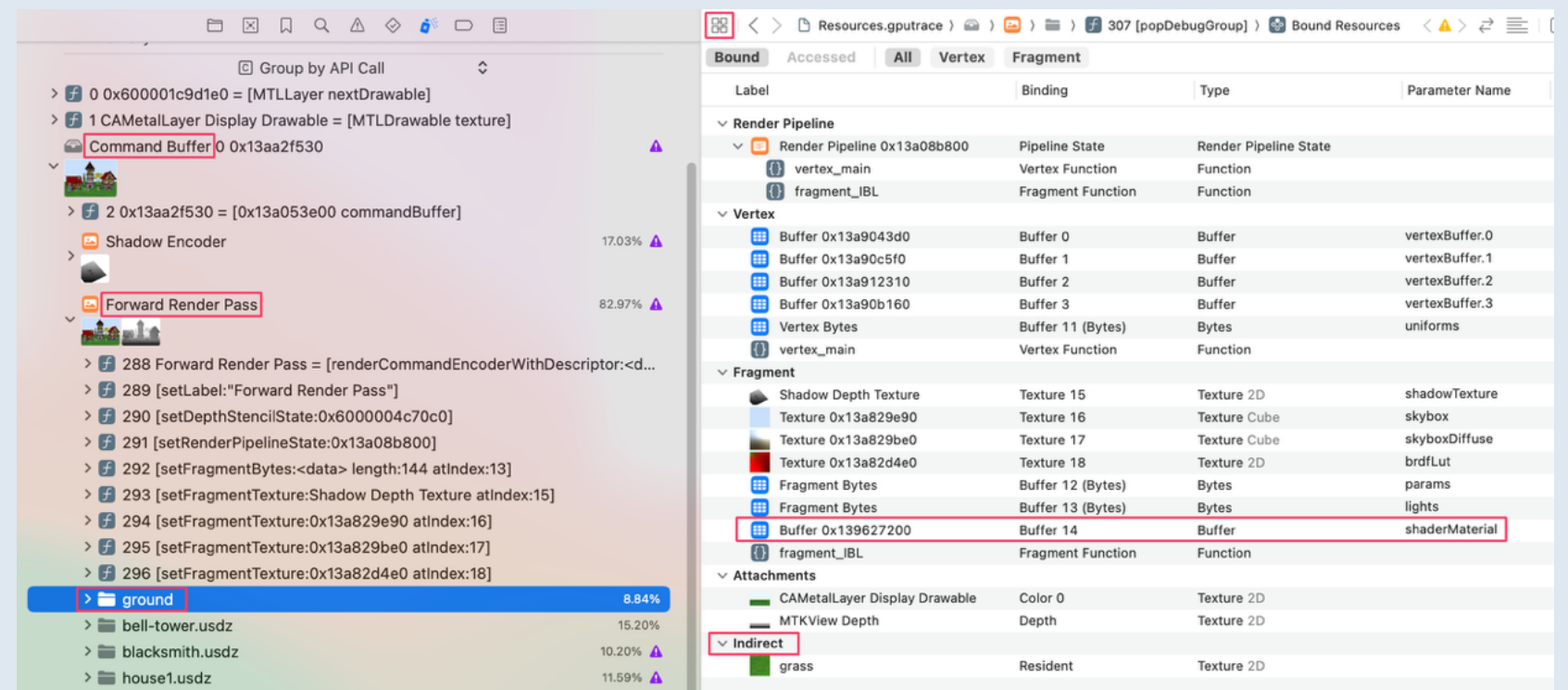
## Creating the Shader Structure

## Creating the Argument Buffer

## Updating the Draw Call



Using argument buffers

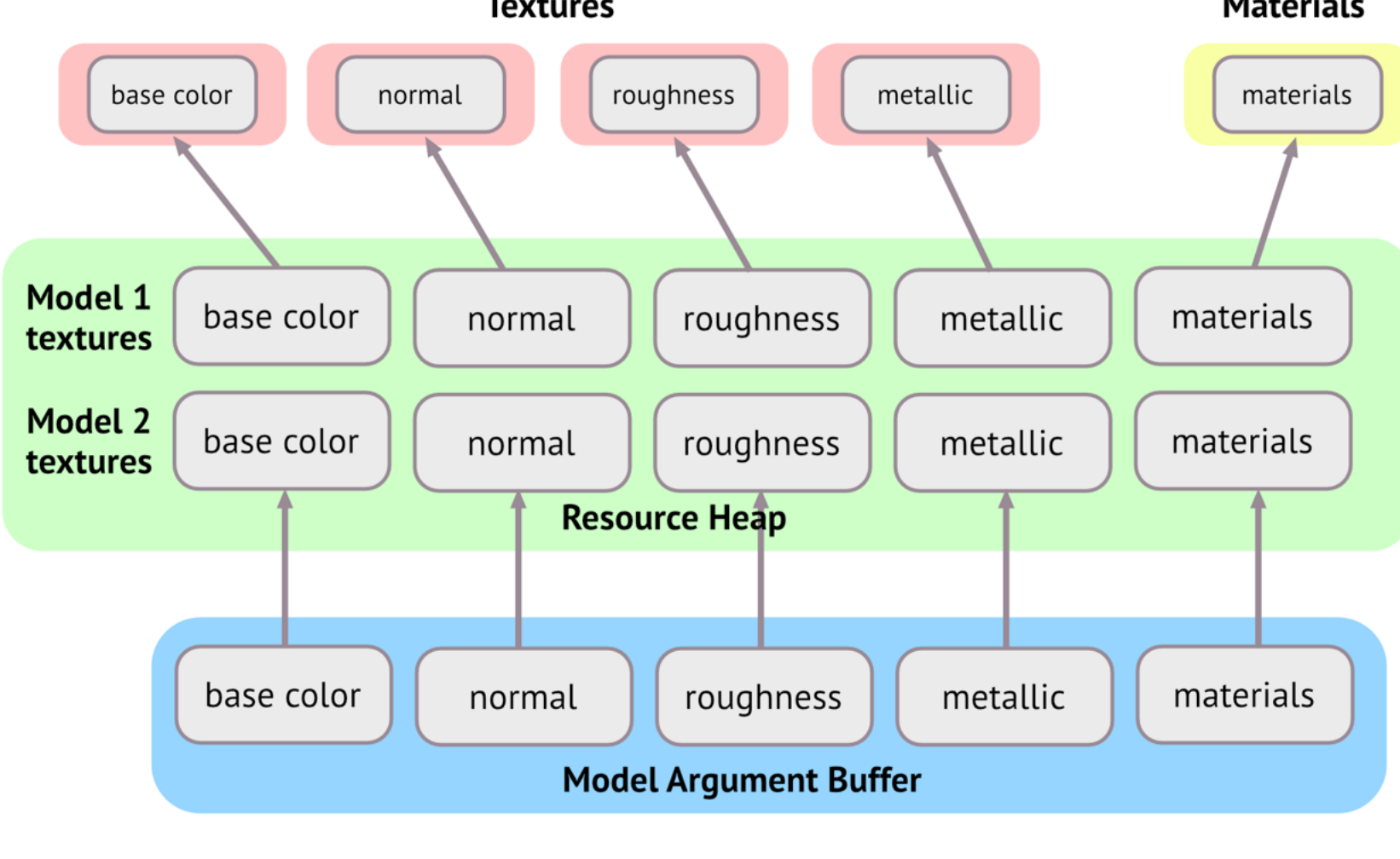


Indirect Resources

Row	Offset	Texture baseColorTexture	Texture normalTexture
0	0x0	grass	null

Ground plane textures

## Resource Heaps



Resource heaps

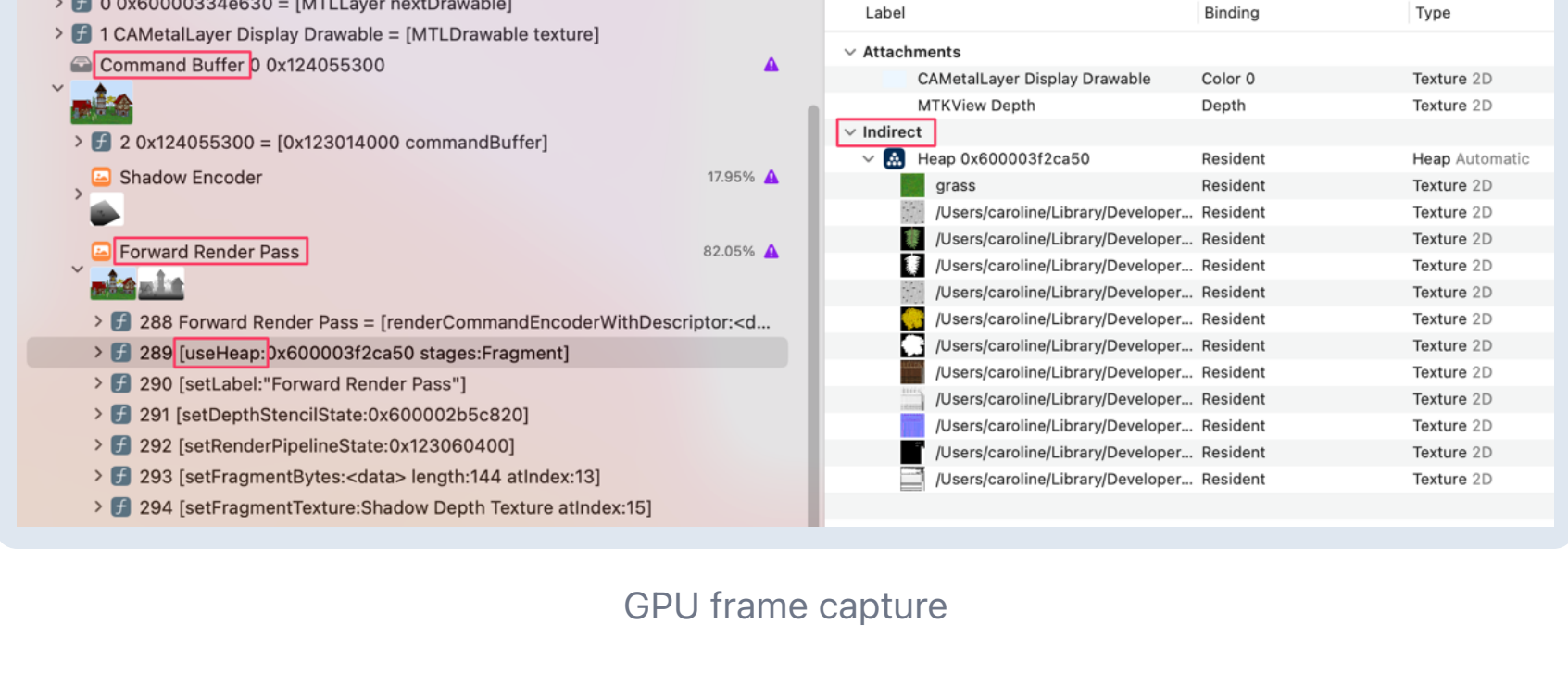
## The Blit Command Encoder



Skeletons on parade



Rendering with a texture heap



GPU frame capture