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Custom Depth and Custom Depth Stencil in UE4

 Graphics  17/06/2019  3 Minutes

Ever wondered how to implement occlusion masking in UE4? I wanted this effect for my game – so I spent some time googling and ended up in Post Process material section of Unreal Engine Documentation. You might be too. There is plenty of tutorials about the use of Custom Depth and Custom Depth Stencil Value material nodes on the Internet. I personally find this youtube video quite helpful:

UE4 Tutorial 101 – Occlusion Outlines



Tom Looman's tutorials are pretty good too: <https://www.tomlooman.com/the-many-uses-of-custom-depth-in-unreal-4/>

But what I did not find and had to figure out on my own is how exactly Custom Depth and Custom Depth Stencil work. And I don't mean how the shader itself works, but rather what kind of values these nodes return. The official documentation gives a vague description of these nodes which does not really help (I have already discussed the quality of the official documentation here:

<https://superyateam.com/2019/02/11/epic-is-considering-adding-an-intermediate-script-language-to-ue4-and-why-this-is-bad/>)

Custom Depth

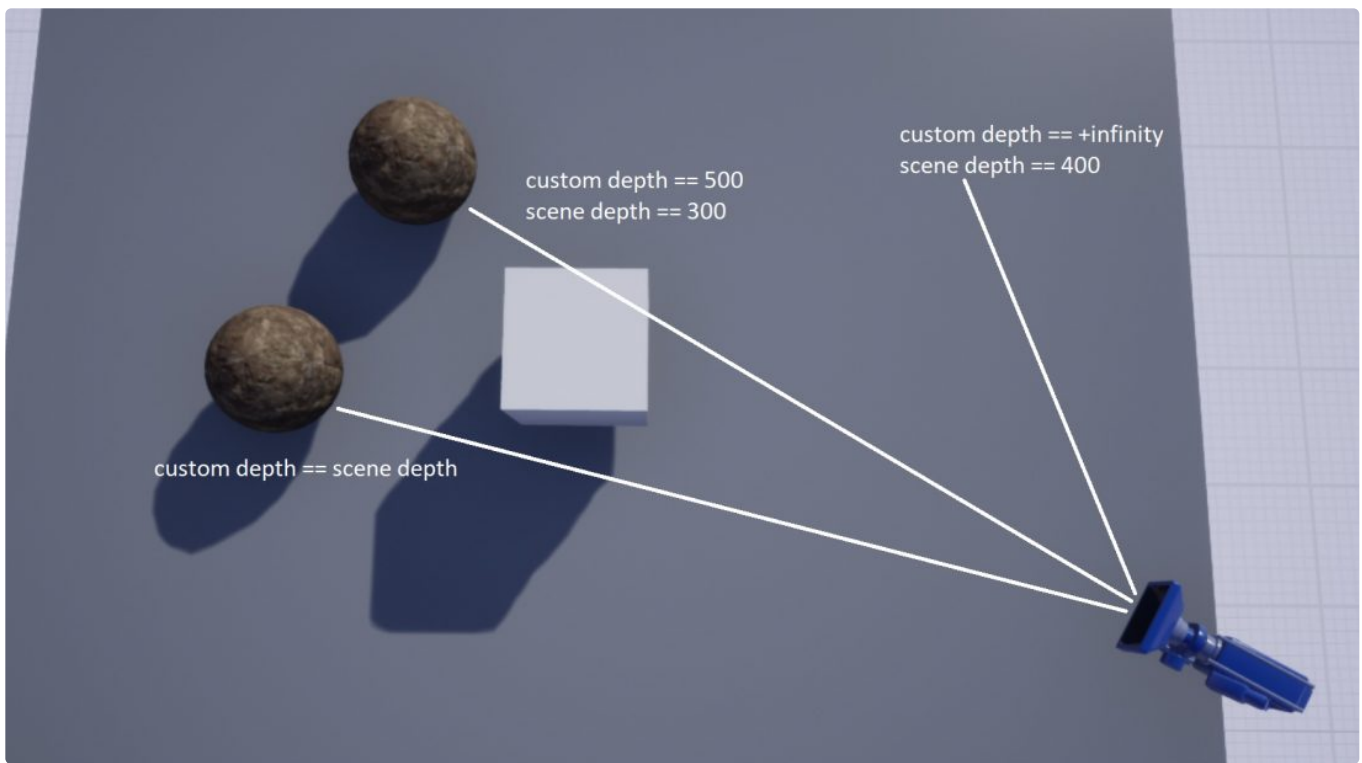
I'll start with Custom Depth node. The official documentation says:

This separate feature enables masking of certain objects by rendering them into another depth buffer (called custom depth buffer).

To be honest, this does not make a lot of sense to me – it does not answer what the range of values the node returns and what exactly custom depth is.

As per my understanding, **custom depth returns a distance in UE4 measurement units (cm) from a player camera to an object with this feature enabled**. Other objects don't have any value in this auxiliary buffer and the node returns positive infinity for them. To prove this sort of a statement, let's have an experiment:

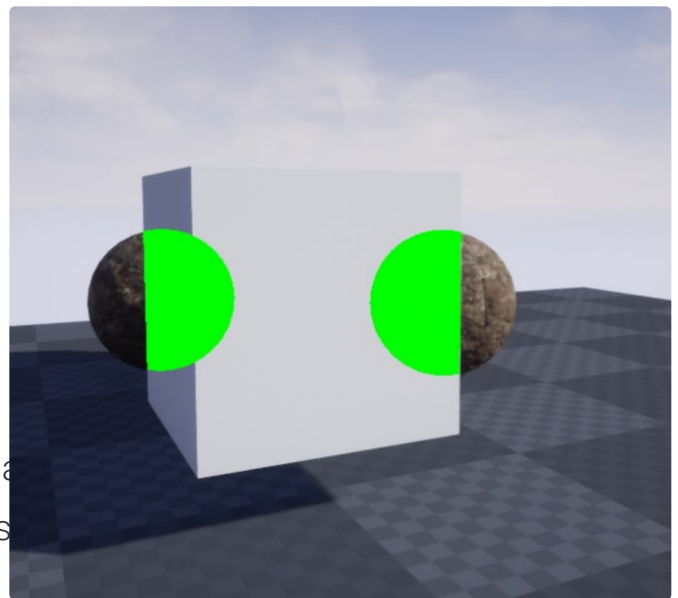
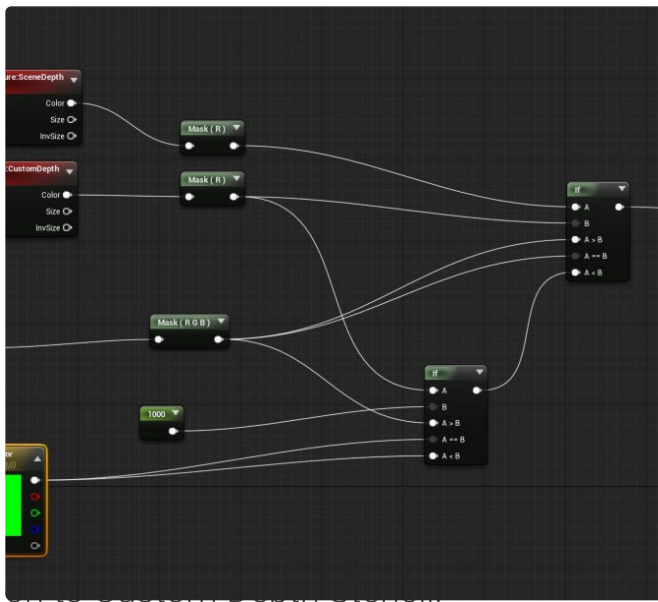
We will place an object (the sphere) with Custom Depth feature enabled behind the cube on this scene:



Visually the whole scene can be split into 3 cases (from left to right on the picture above):

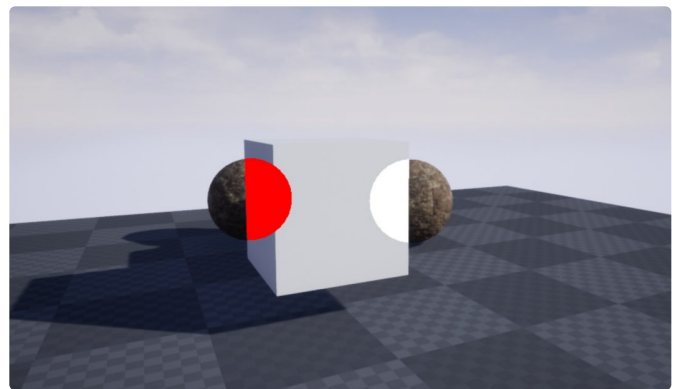
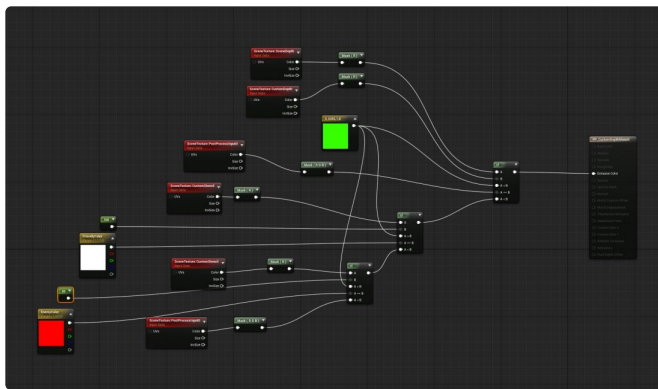
1. The sphere which has the feature on. Custom Depth equals to Scene Depth in this case.
2. The cube in front of the sphere. Scene depth of the cube is less than Custom Depth of the sphere.
3. Objects with the feature disabled (by default). Custom depth returns positive infinity and Scene Depth returns an actual distance to such objects.

NOTE: There is a small issue here: Case #2 is logically the same as Case #3 – in both cases, Scene Depth is less than Custom Depth. To distinguish the cases and for the sake of the experiment, we can compare Custom Depth to some arbitrary value which is lower than positive infinity but which is greater than a distance to any object in the scene. Let it be 10 meters (1000 ue4 units):



Custom Depth Stencil

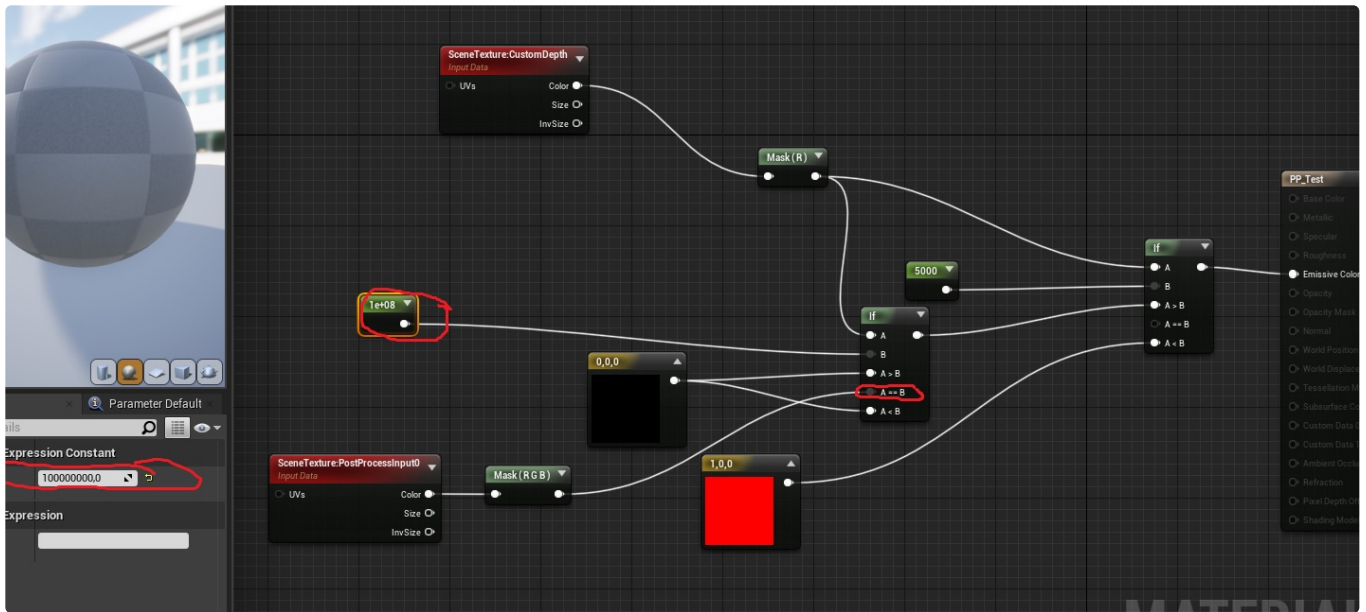
The other useful node is Custom Depth Stencil. You may use it in order to distinguish objects in a scene. By default, **it returns 0 (zero) for all objects and a custom value manually set in Mesh settings.**



I set Custom Depth Stencil value of 50 to the sphere on the left. And 100 – on the right. I also extended the material blueprint for the case when a mesh with Custom Depth feature is enabled – I check Custom Depth Stencil values as well too. Now, it's just a matter of two "if" statements to figure out which color a sphere needs to be. If Custom Depth Stencil value is 50, then the color is red. If 100, then the color is white.

IMPORTANT UPDATE 29.02.2020

It turns out that CustomDepth node returns 100000000 cm rather than positive infinity when this feature is not enabled on an object. Here is a test Post Process material which, sort of, proves that:



I could not find the source code where this number comes from. So, I would appreciate it if you point me out where it is defined!

You may find this interesting too:

How to implement vehicle AI in UE4

Unreal Engine 4 has a character AI implemented out of the box. And I have already posted about simple behavior trees. But what about non-characters? Well, this is unknown territory. But good thing Epics left some hooks which you can use to turn things alive. This is a tutorial on...

How to use ProceduralMeshComponent in UE4

Procedural Meshes in UE4 Recently for my work, I had to build a custom mesh using ProceduralMeshComponent in UE4. The last time I worked with it a long time ago, so I decided to google some tutorials. To my surprise, there weren't many: no documentation from Epics and an old...

Tagged: custom depth, custom depth stencil, interesting, occlusion masking, post process, ue4

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11 thoughts on “Custom Depth and Custom Depth Stencil in UE4”



SIVADHARSHINI P

24/04/2020 at 14:20

Hi, i have used get custom depth stencil function, the output value is an exec pin which i wanted to pass it through an integer block. how can i do that?

[↩ Reply](#)



superyateam

24/04/2020 at 14:25

What do you mean? Can you give a link to a screenshot? I don't understand the problem

[↩ Reply](#)





Sivadharshini

27/04/2020 at 08:17

Sorry I dont know how to show you the images as I cant attach images here. There is a block called "Set custom depth stencil value" and its output execution pin is there. I should connect that pin to another block which is an integer block. When I try connecting its showing, " Exec is not compatible with integer". How to resolve it? Are there any blocks that can be added in between to pass to to an integer block?

↩ Reply



superyateam

27/04/2020 at 13:34

Ah, I see what you mean... Sort of.

<https://docs.unrealengine.com/en-US/BlueprintAPI/Rendering/SetCustomDepthStencilValue/index.html>

"Set Custom Depth Stencil Value" does not return any value. It just sets the stencil value for its target: a primitive component.

What kind of integer block are you talking about?

Can you take a screenshot of your blueprint and upload it to Imgur, for example?

↩ Reply



Sivadharshini

28/04/2020 at 10:17

<https://ibb.co/NKL1tM0>

<https://ibb.co/gRhkNwf>

These are the image links, where the custom stencil value that is set should be given to the instance I'd part which accepts integers. Can you help me with this?



superyateam

28/04/2020 at 11:18

Hi, Sivadharshini!

Use the value which you pass to Set Custom Stencil Value as an input to your integer block. I don't see another way.

Hope it helps!

[↩ Reply](#)



Sivadharshini

28/04/2020 at 11:47

Thank you, i will try it.



hans

27/04/2020 at 06:36

Obrigado! Ajuda muito 😊

↳ Reply



Haritha

29/04/2020 at 16:23

Hi, I am trying to capture images from two cameras. But as in UE we can capture only the view port, i cant use two cameras in parallel to capture images. Any idea of how we can use two cameras and capture images from both simultaneously? any help will be appreciated. Thankyou.

↳ Reply



Vinayak

03/11/2020 at 09:44

I heard stencil is 8-bit so it supports only 256 colors. I want more colors for stencil like 2000. Is there a way to make stencil 16-bit??

↳ Reply



anybody

18/08/2022 at 21:38

thankx for help. but i have a problem what is when my RPG character equip like a sword.

the sword cause occlusion masking to player body.
so i want set what actor block mask or not.
how can i?

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