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This document is about: **QUANTUM 2**SWITCH TO 

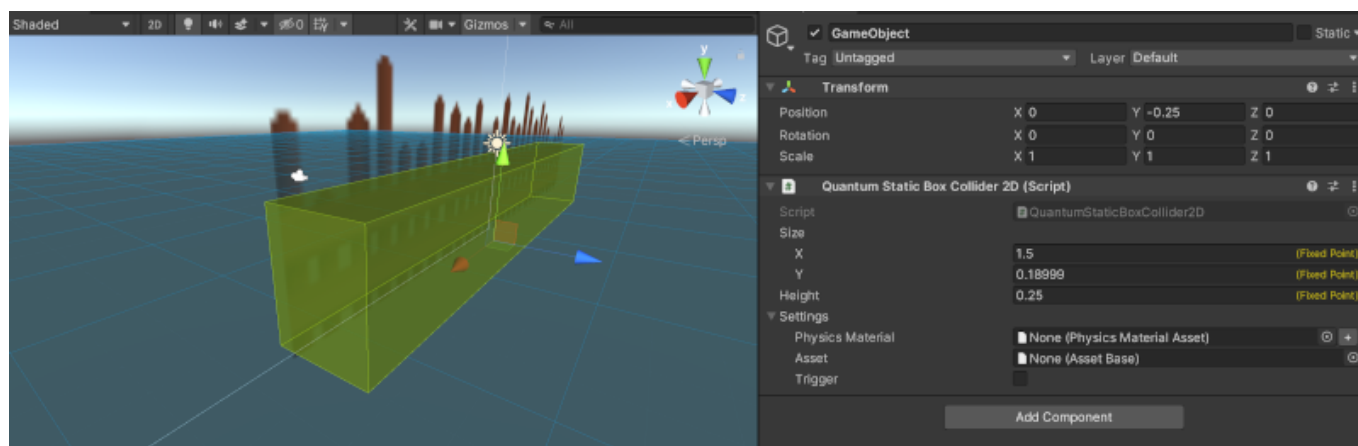
2.5D Physics

Introduction

Using 2.5D Physics you are able to add Height, or thickness depending on your perspective, while still benefiting from most performance advantages available in 2D. **N.B.:** Use *Vertical Transform* has to be manually enabled in the *SimulationConfig* asset's Physics settings.

2.5D Physics with Vertical Data

StaticCollider2D can have 'thickness' in the 3rd dimension using Quantum's 2.5D physics; simply set the *Height*:



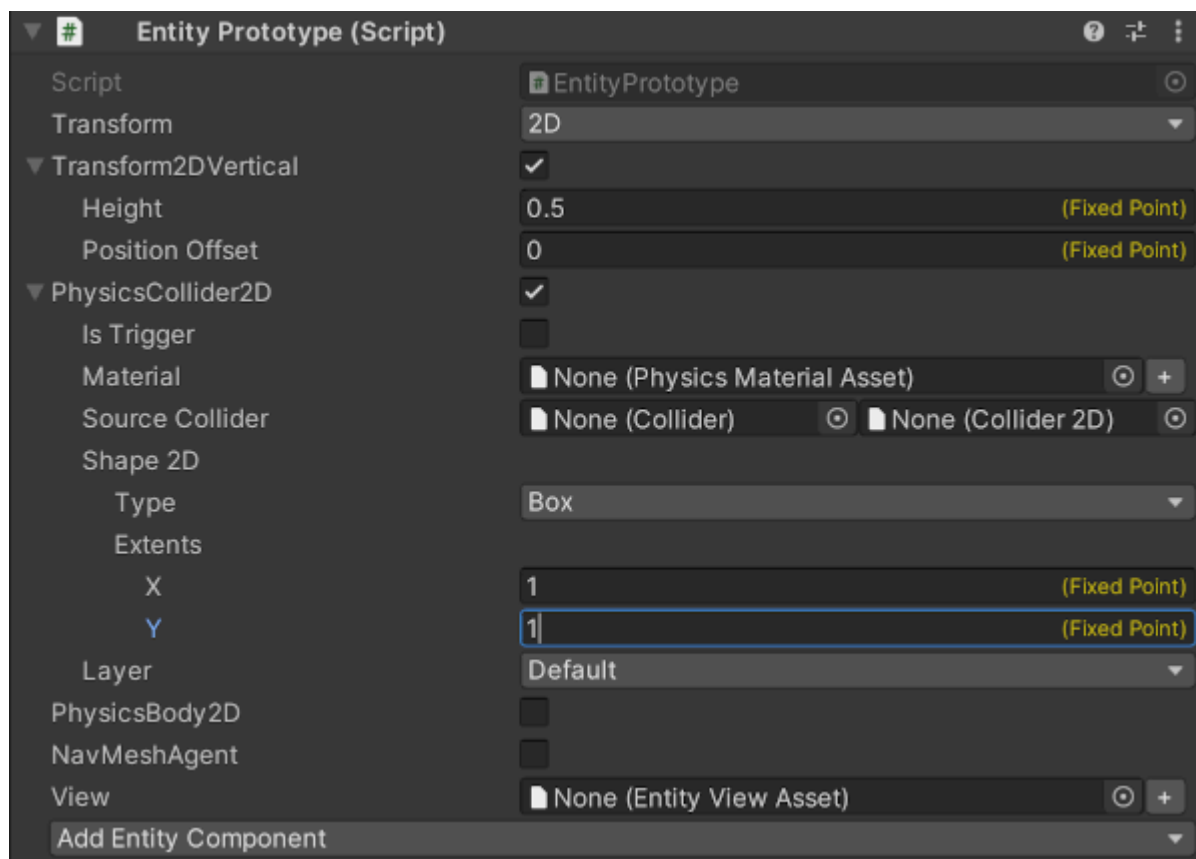
Adding Height to a Static Collider.

For Entities, just add the *Transform2DVertical* component and set its *Height* and *Position*. On a Quantum XZ-oriented game, this adds height on the Y axis, for example. **N.B.:** *Transform2DVertical* requires the *Transform2D* component.



```
var transform2dVertical = new Transform2DVertical();
transform2dVertical.Height = FP._1;
transform2dVertical.Position = FP._1;

f.Set(entity, transform2dVertical);
```



Adding Height to an Entity Prototype.

If entities or statics have a 3rd dimension, the physics engine will take into consideration when solving collisions. This allows for 'aerial' entities to fly over 'ground-based' ones, etc.

Physics Engine Implications

Entity Separation

Important: When a collision is detected, the collision solver does not use the extra dimension information. This can result in entity bounce when separation is performed on the basic 2D plane of



It is possible to simulate 3-dimensional gravity by manually applying speed and forces directly on *Transform2DVertical.Position*. The physics engine will use that information only for collision detection though.

Raycast and Overlaps



These functions are by default all flat and only execute on the 2D plane. To take advantage of 2.5D, you have to use the *overloaded* version that takes the *height* and vertical *offset* as parameters.

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