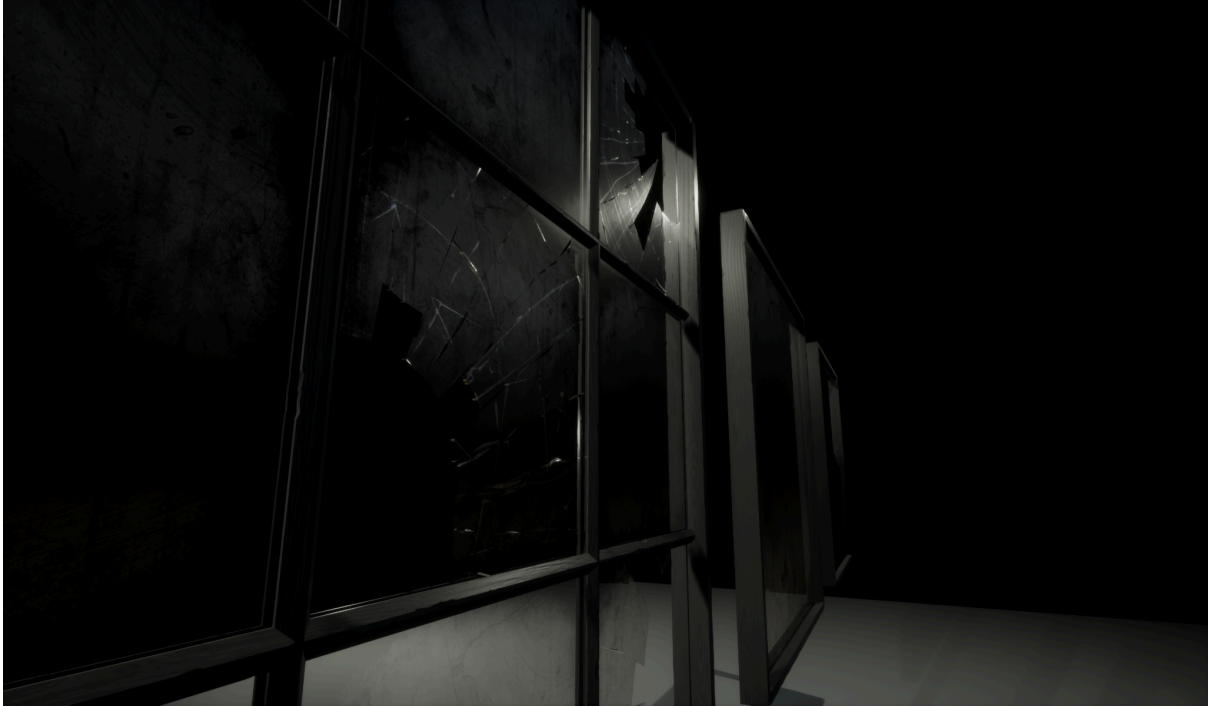




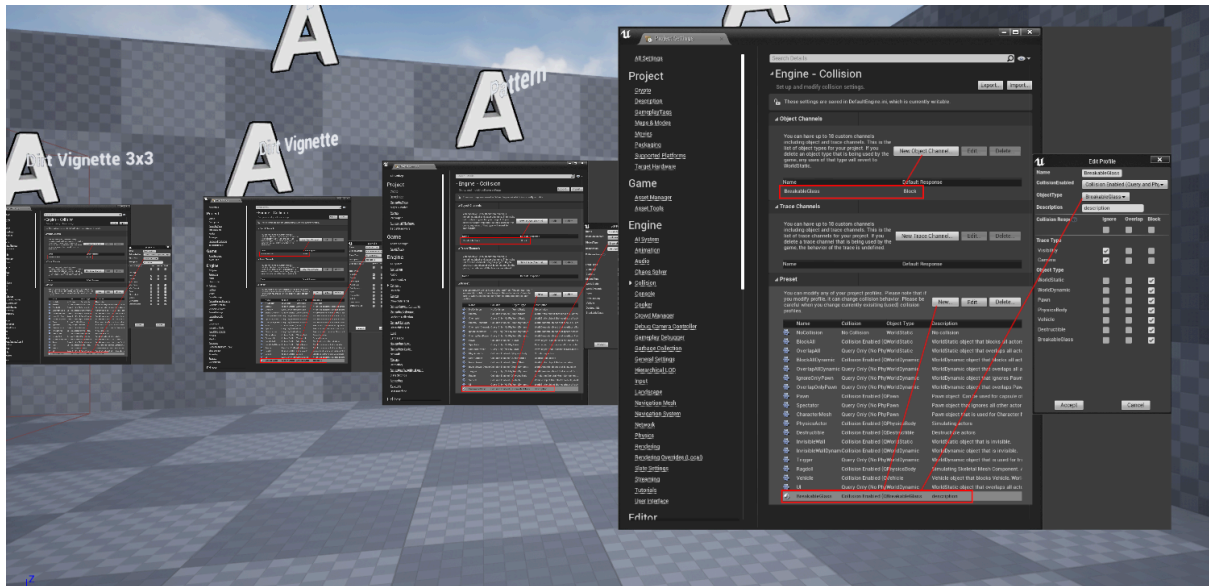
# Breakable Glass v5 Documentation

1. First Steps
2. Nodes and functions.
3. Breakable Glass settings
4. Save, Load and delete
5. Replication

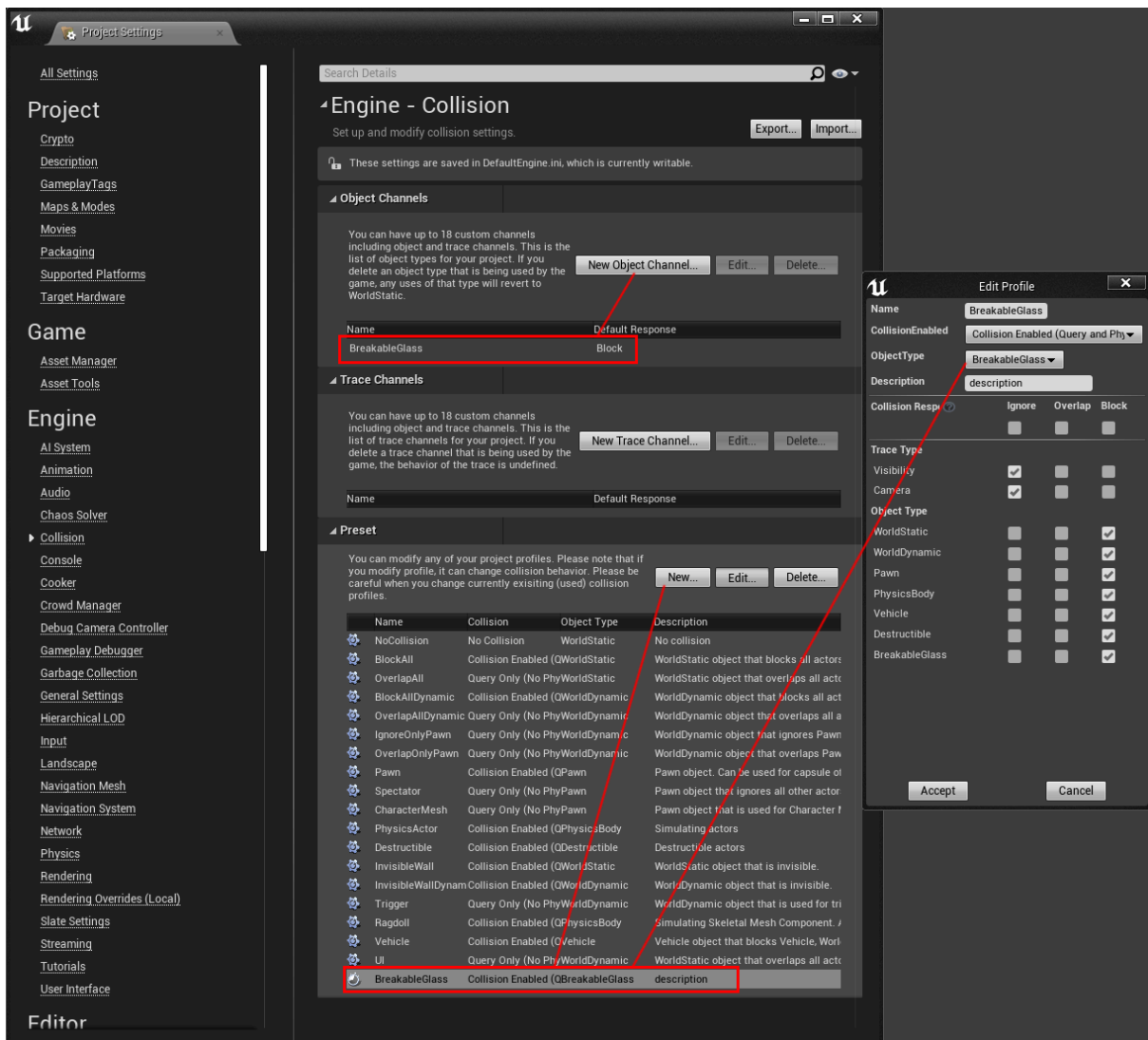
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[Video tutorial](#) (Working on video tutorial for version 5.0.3)

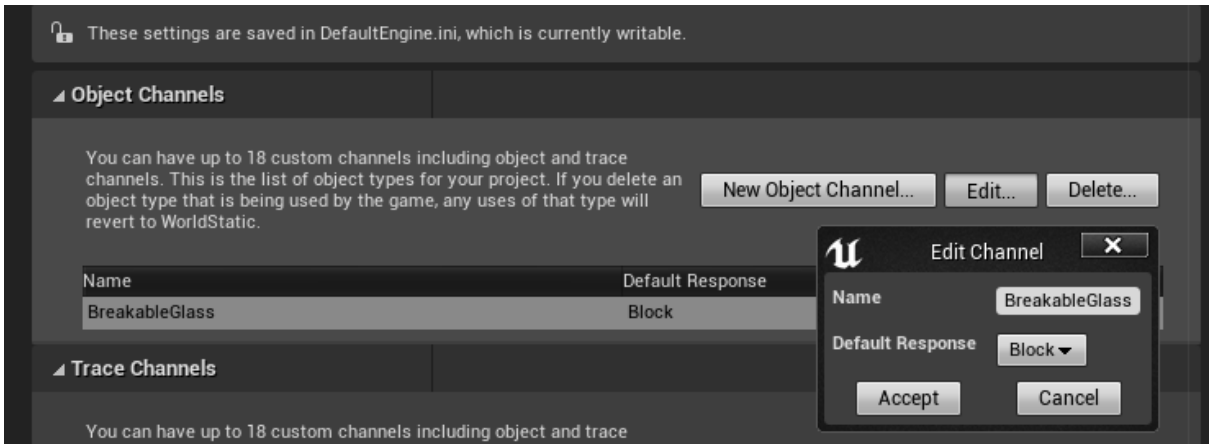
## 1. First Steps



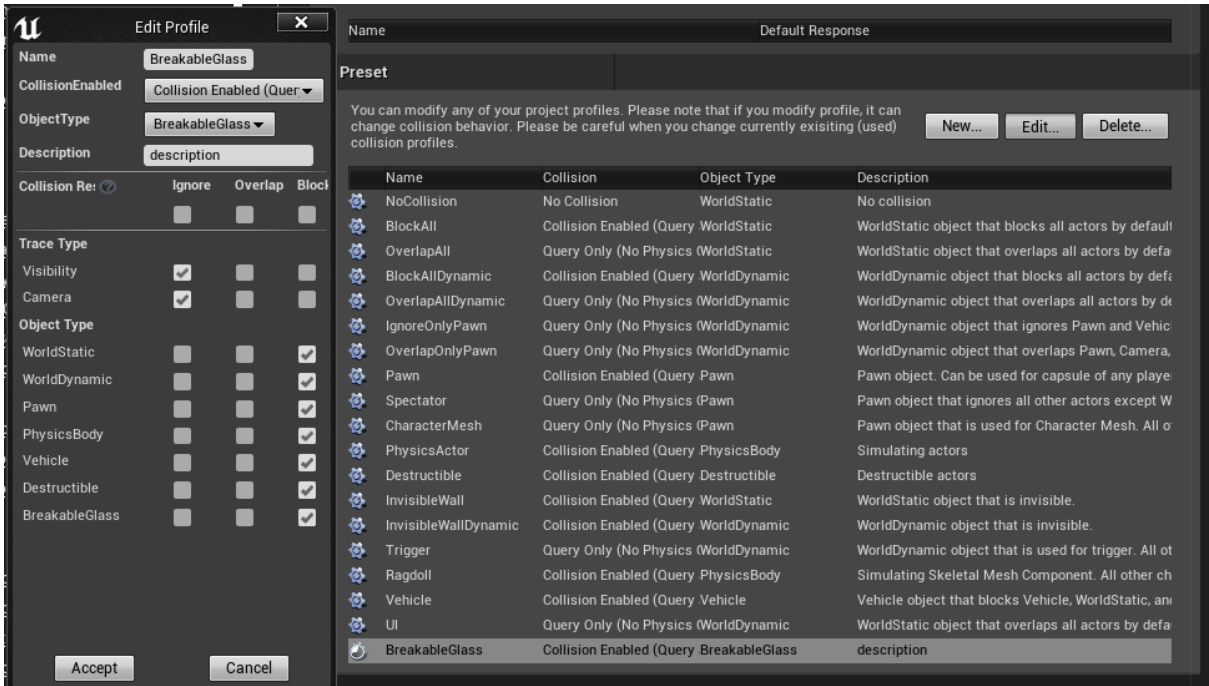
You need to create a new collision channel object called "BreakableGlass" for the assets to work correctly.



Go to (ProjectSettings/collision) and create new object channel called “BreakableGlass” and the Default Response setted to “Block”



Next, you need to create a new preset called "Breakable Glass" with the same settings as in the image.

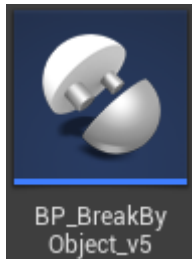


**For the changes to take effect it is necessary to restart the editor**

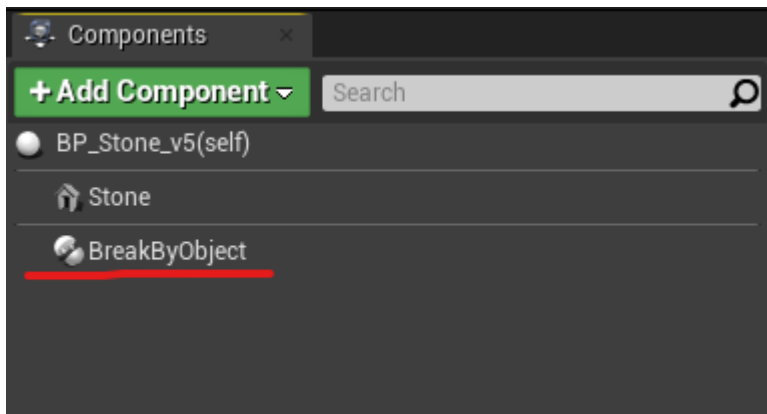
## 2. Nodes and Functions

### Break with an object

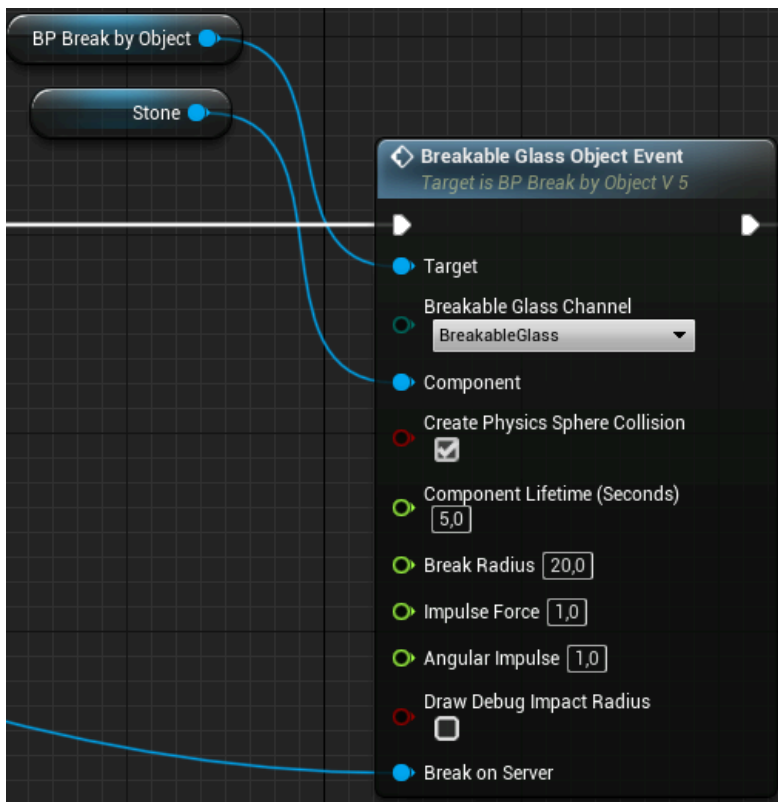
You can break with a physics object like a stone or bullet.



You need to add this component into the actor you want to use to break the glass.  
This component is used in throwing actors like a stone or bullet with mesh and collision.



Then, you need to call the function "Breakable Glass Object Event" from the component and set some parameters.



**Exec:** Execution event (add here the event you want to call this function).

**Target:** "BP\_BreakByObject\_v5" Component.

**Breakable Glass Channel:** Select the "BreakableGlass" channel you have created.

**Component:** Add here the object with which you want to break the glass

**Create Physics Sphere Collision:** If true it will create a collision sphere around the object which will push the glass shards

**Component Life Time:** Time before kill this component.

**Break Radius:** Set the impact radius.

**Impulse Force:** Impulse force multiplier. If you raise this parameter the glass pieces fly further.

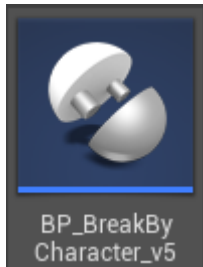
**Angular Impulse:** Angular Impulse Multiplier. if you raise this parameter the glass pieces change it's angle faster

**Draw Debug Impact Radius:** You can visualize the impact radius.

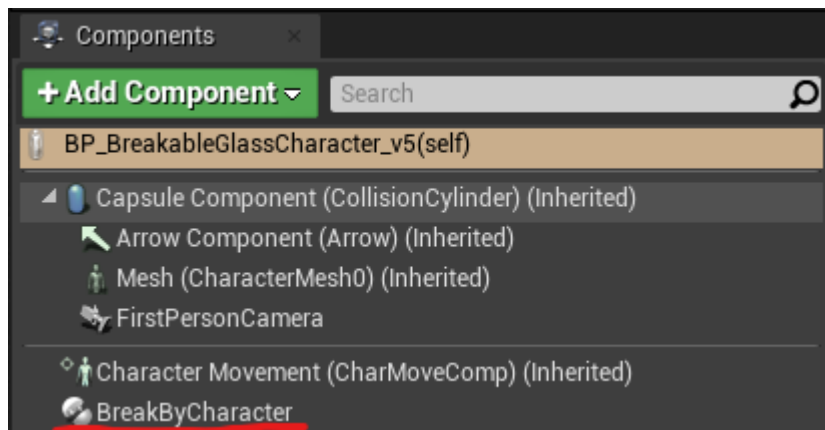
**Break on Server:** For the replication with this component you have to add here the component "BP\_BreakOnServer\_v5" derived from the player's Blueprint.  
More information in the REPLICATION section.

### Break with character body

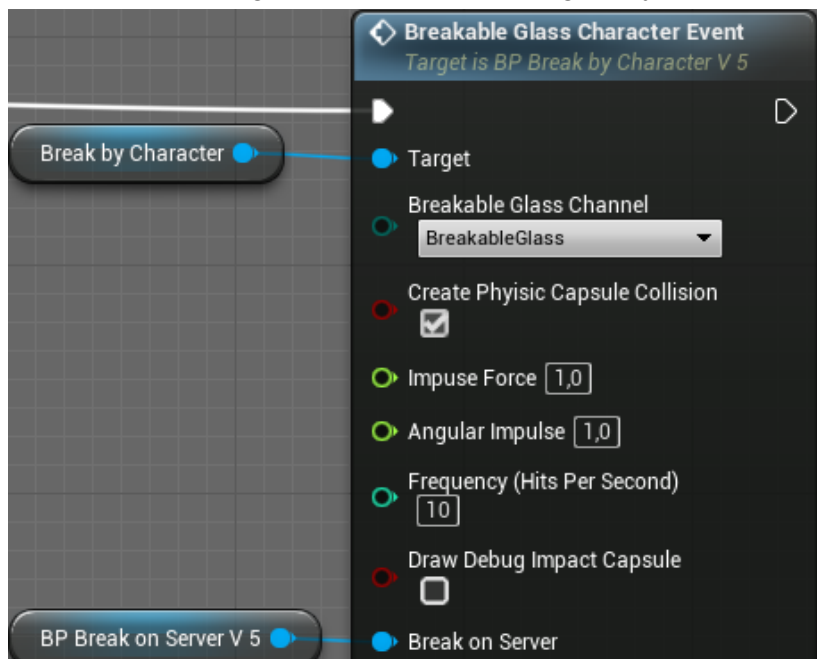
You can break with the character's body if you hit the glass with it.



You need to add this component into your character.



You need to call the function "Breakable Glass Character Event".  
I recommend calling the function in the "BeginPlay".



**Exec:** Execution event (add here the event you want to call this function).

**Target:** BP\_BreakByCharacter\_v5

**Breakable Glass Channel:** Select the "BreakableGlass" channel you have created.

**Create Physics Capsule Collision:** If true it will create a capsule collision around the object which will push the glass shards

**Impulse Force:** Impulse force multiplier. If you raise this parameter the glass pieces fly further.

**Angular Impulse:** Angular Impulse Multiplier. if you raise this parameter the glass pieces change its angle faster.

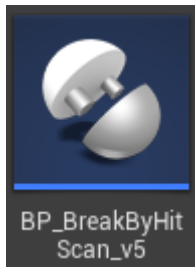
**Frequency:** Number of hits per second.

**Draw Debug Impact Capsule:** You can visualize the impact capsule.

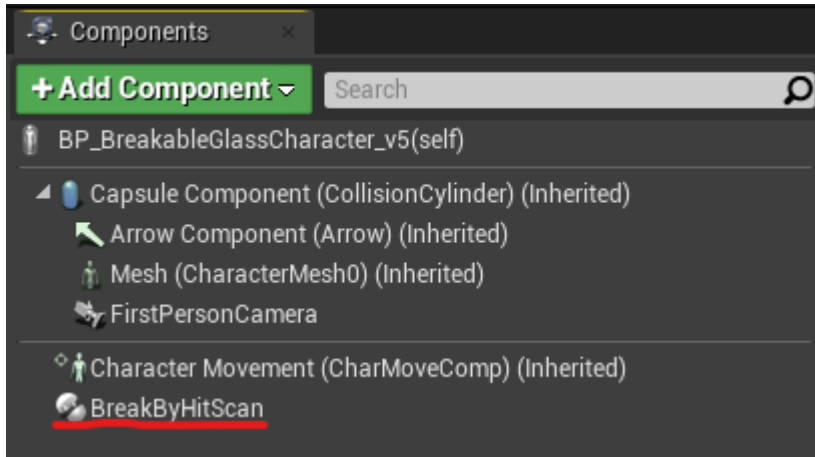
**Break on Server:** For the replication with this component you have to add here the component "BP\_BreakOnServer\_v5" derived from the player's Blueprint.  
More information in the REPLICATION section.

## Break with Hitscan

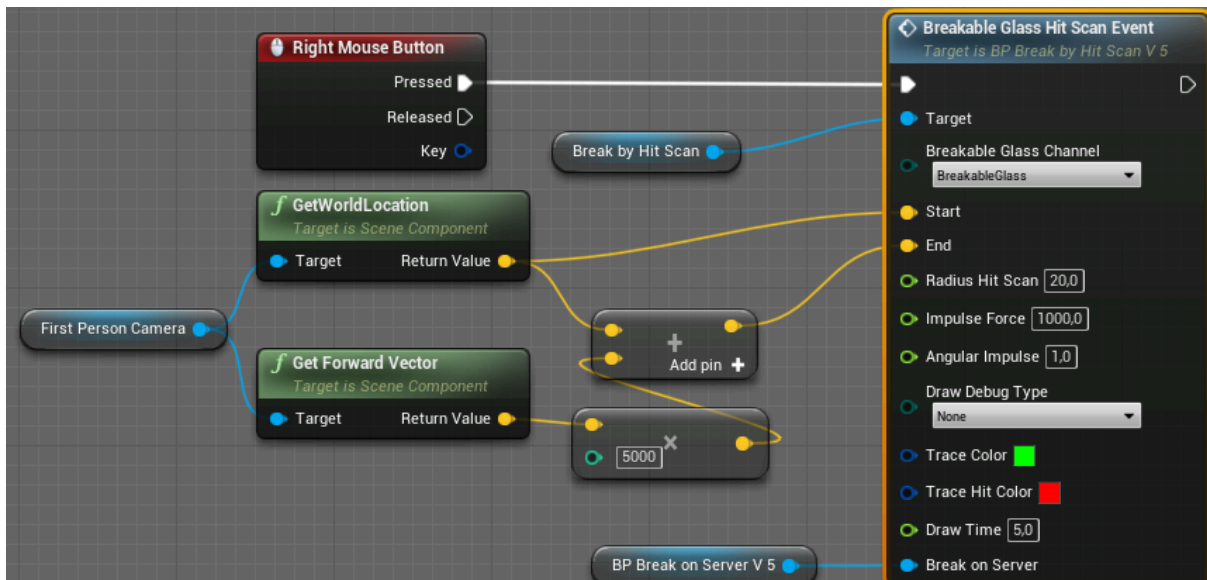
You can break with multi line traces.



You need to add this component into the actor you want to make a line trace.



Then, you need to call Function “Breakable Glass Hit Scan Event”



**Exec:** Execution event (add here the event you want to call this function).

**Target:** BP\_BreakByHitscan\_v5.

**Breakable Glass Channel:** Select the "BreakableGlass" channel you have created.

**Start:** Start Trace Location.

**End:** End Trace Location.

**Radius Hit Scan:** Radius that break the glass when line trace hits

**Impulse force:** Impulse force multiplier. If you raise this parameter the glass pieces fly further.

**Angular Impulse:** Angular Impulse Multiplier. if you raise this parameter the glass pieces change its angle faster.

**Draw Debug Type:** Shows the line trace.

**Trace Color:** Color for the line trace.

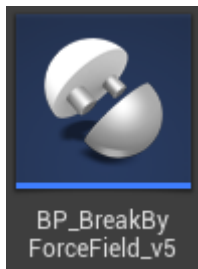
**Trace Hit Color:** Color for the line trace when hit.

**Draw Time:** Is the time drawing line trace if Draw Debug Time is set to For Duration.

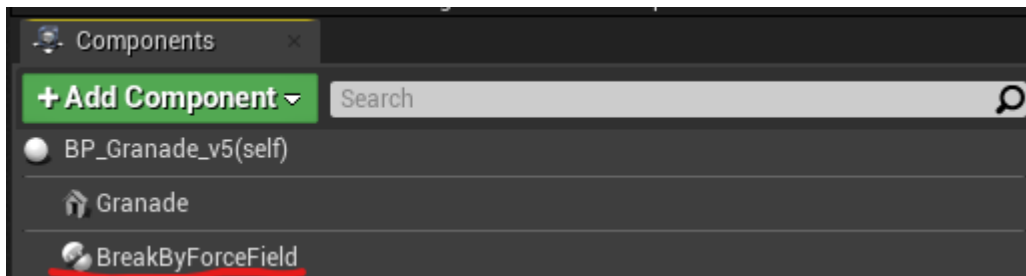
**Break on Server:** For the replication with this component you have to add here the component "BP\_BreakOnServer\_v5" derived from the player's Blueprint.  
More information in the REPLICATION section.

## **Break By Force Field**

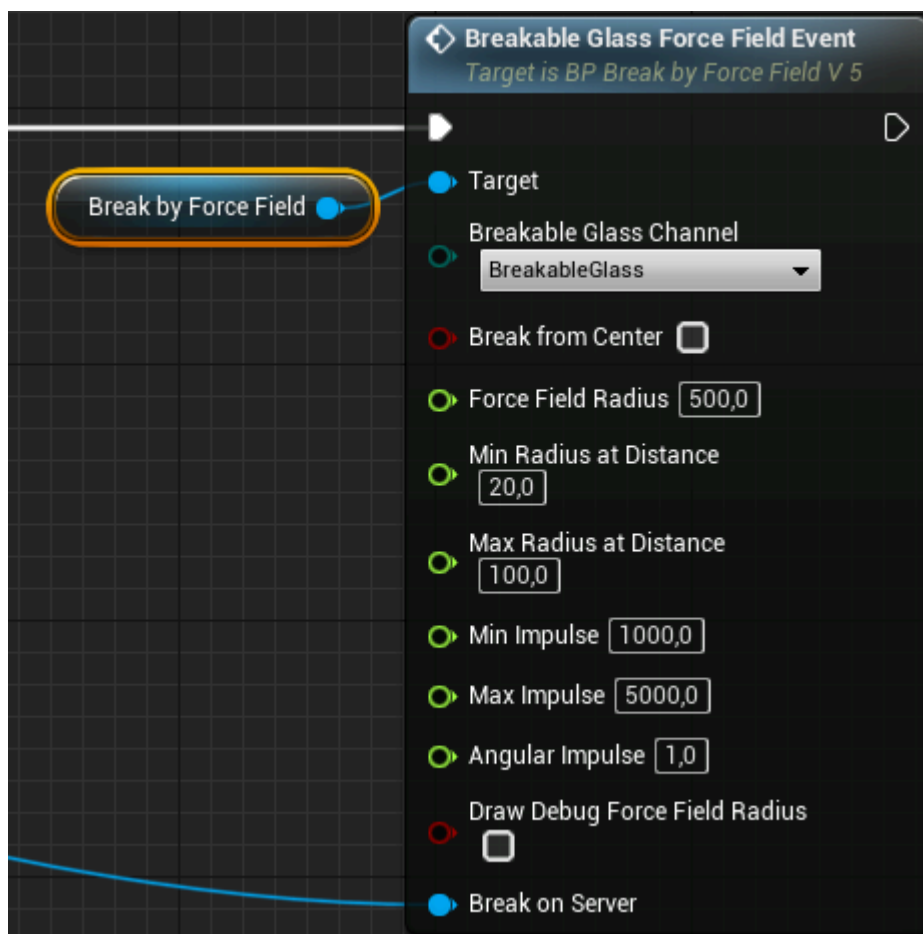
You can break multiple glasses with a force field (explosion). You can add this component in something like a grenade or rocket.



You need to add this component into the actor you want to make a force field (ex: grenade).



You need to call the function "Breakable Glass Force Field" to make the force field happen.



**Exec:** Execution event (add here the event you want to call this function).

**Target:** BP\_BreakByForceField\_v5.

**Breakable Glass Channel:** Select the "BreakableGlass" channel you have created.

**Break From Center:** Determines if the glass is breaking from center or from the closest point to the actor you used to make the force field.

**Force Field Radius:** All the BP\_BreakableGlass\_v5 inside this radius will be affected by the force field.

**Min Radius at Distance:** Is the radius what breaks the glass. if the force field actor is far from the glass the radius value will be equal to Min Radius at Distance.

**Max Radius at Distance:** Is the radius what breaks the glass. if the force field actor is near from the glass the radius value will be equal to Max Radius at Distance.

**Min Impulse:** Is the impulse applied to the glass. If the force field actor is far from the glass the impulse will be equal to Min Impulse.

**Max Impulse:** Is the impulse applied to the glass. If the force field actor is near from the glass the impulse will be equal to Max Impulse.

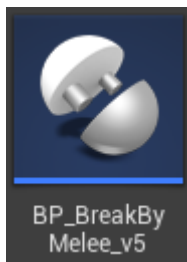
**Angular Impulse:** Angular Impulse Multiplier. if you raise this parameter the glass pieces change its angle faster.

**Draw Debug Force Field Radius:** Draws the force field radius.

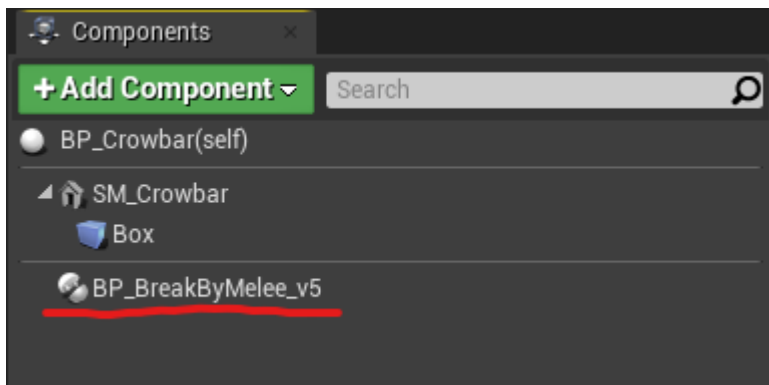
**Break on Server:** For the replication with this component you have to add here the component "BP\_BreakOnServer\_v5" derived from the player's Blueprint.  
More information in the REPLICATION section.

### **Break By Melee**

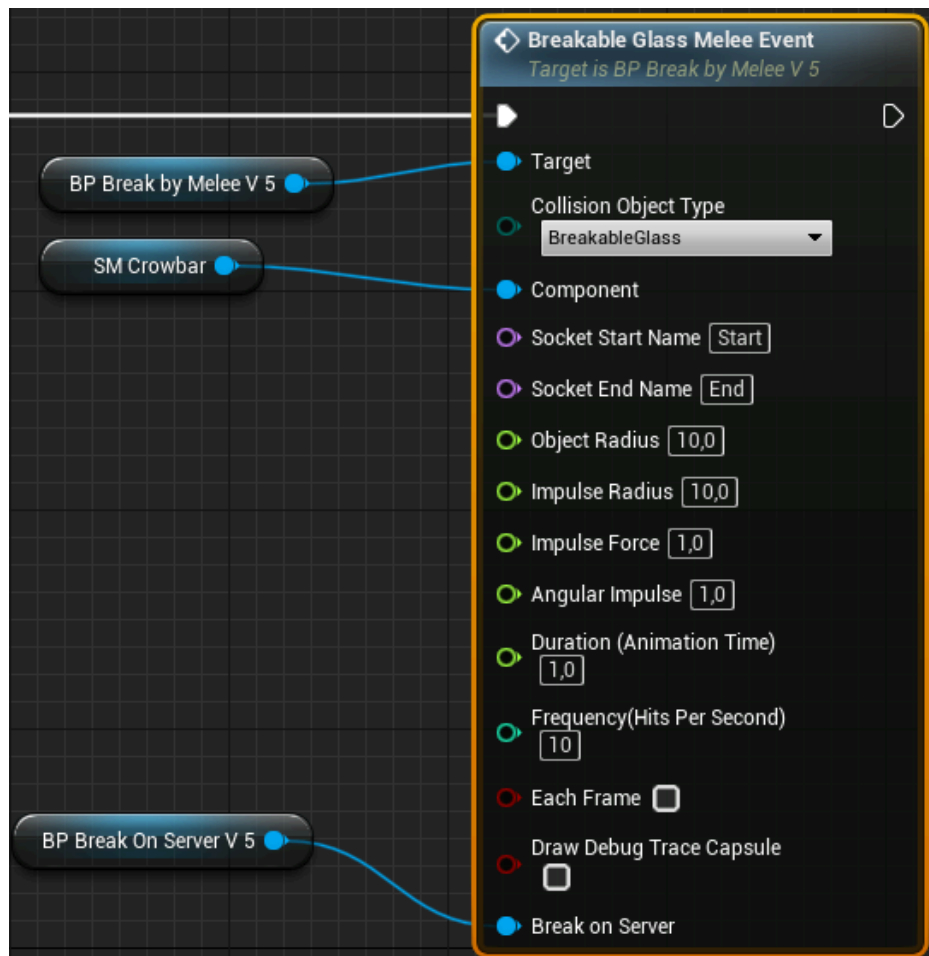
You can break the glass by hitting it with melee objects. Ex: with a crowbar.



You need to add this component into the actor you want to use to break the glass.



You need to call the function “Breakable Glass Melee Event”



**Exec:** Execution event (add here the event you want to call this function).

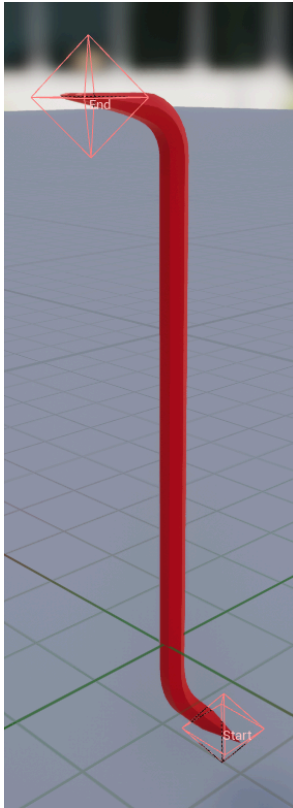
**Target:** BP\_BreakByMelee\_v5.

**Breakable Glass Channel:** Select the “BreakableGlass” channel you have created.

**Component:** Add here the object with which you want to break the glass

**Socket Start Name:** You need to create start and end sockets in to the mesh you want to use to break the glass.

**Socket End Name:** You need to create start and end sockets in to the mesh you want to use to break the glass.



**Object Radius:** Radius from to object (capsule bounds of the object).

**Impulse Radius:** Set the impact radius.

**Impulse Force:** Impulse force multiplier. If you raise this parameter the glass pieces fly further.

**Angular Impulse:** Angular Impulse Multiplier. if you raise this parameter the glass pieces change it's angle faster.

**Duration:** Detect glass duration when event is called (Normaly animation time).

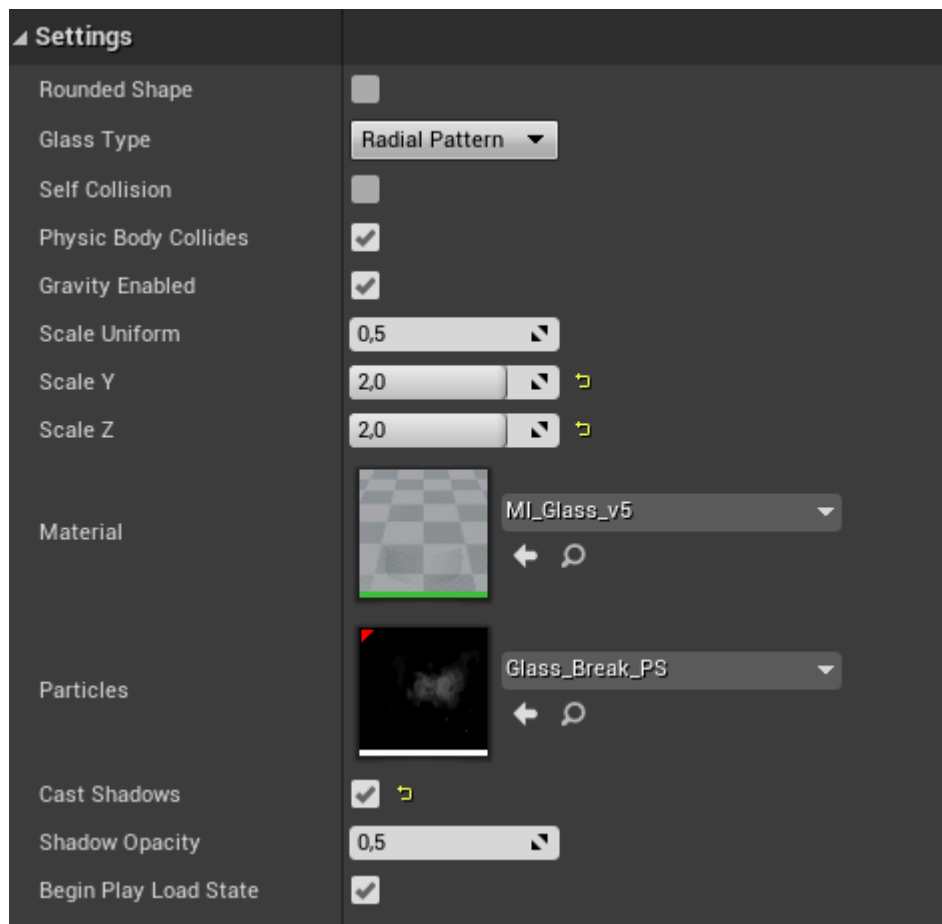
**Frequency:** Number of hits per second.

**Each Frame:** If true the event is called every duration time.

**Draw Debug Trace Capsule:** You can visualize the capsule and the hit radius.

**Break on Server:** For the replication with this component you have to add here the component "BP\_BreakOnServer\_v5" derived from the player's Blueprint.  
More information in the REPLICATION section.

### 3. Breakable Glass Settings.



**Rounded Shape:** Choose between rectangular or cylindrical shape

**Glass Type:** Choose the breaking shape.

-Radial Pattern: Is the cheaper one. The glass breaks in a radial pattern but the pieces don't break in sub pieces.

-Radial Pattern Sub Pieces: The glass breaks in a radial pattern and the pieces break in more sub pieces. Can affect performance.

-Sharp Spiky Sub Pieces: Glass breaks in radial pattern but the shape of the pieces is sharper and has more of them. Can affect Performance +.

**Self Collision:** The pieces collide with other pieces.

**Physic Body Collides:** Objects with physic body collision type can collide with each glass chunk

**Gravity Enabled:** Enable or disable gravity for specific glass actor.

**Scale Uniform:** Scale the glass actor in the 3 axis uniformly

**Scale Y:** Scale the glass in Y axis. (Scale specific components and material function).

**Scale Z:** Scale the glass in Z axis. (Scale specific components and material function).

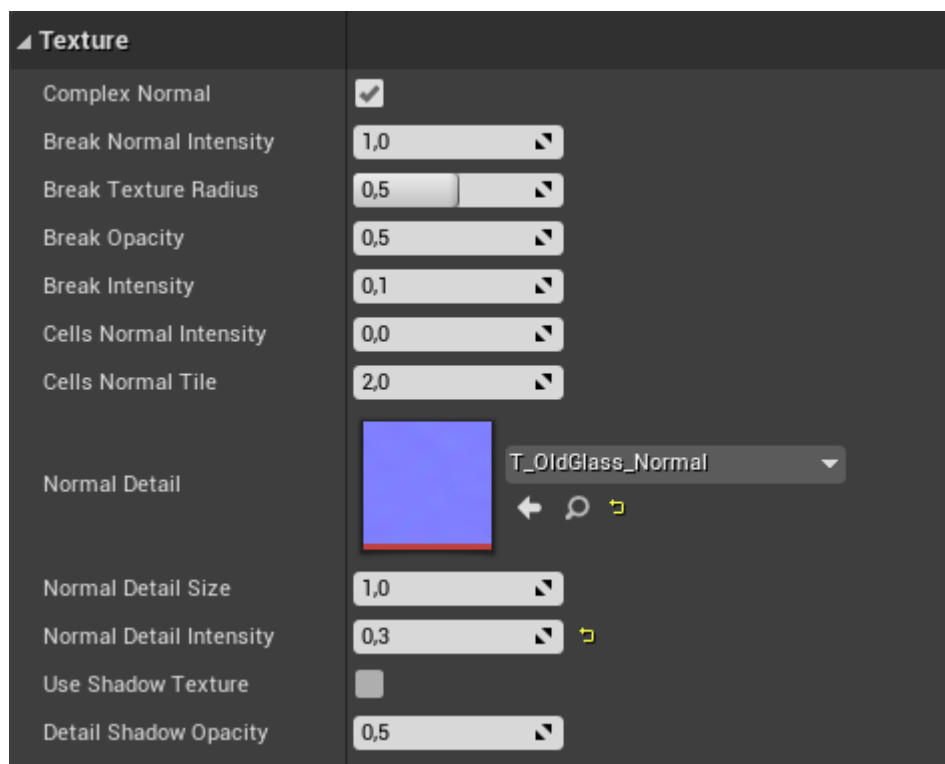
**Material:** Choose the material for the glass. (The asset only works with materials v5).

**Particles:** Choose the particle system you want to spawn when glass is broken.

**Cast Shadows:** Select if the glass cast shadows or not.

**Shadow Opacity:** set the casted shadow opacity.

**Begin Play Load State:** If there are saved state you can choose if it's loaded on begin play for each glass actor.



**Complex Normal:** Change the normal map for more detailed ones

**Break Normal Intensity:** Determines the intensity for the normal map when glass is broken.

**Break texture Radius:** Determines the Radius for the normal map when glass is broken.

**Break Opacity:** Determines the cracks opacity for the color when the glass is broken.

**Break Intensity:** Determines the cracks color intensity when the glass is broken.(Emissive).

**Cells Normal Intensity:** Tempered glass breaks normal map intensity.

**Cells Normal Tile:** Tempered glass breaks normal map size.

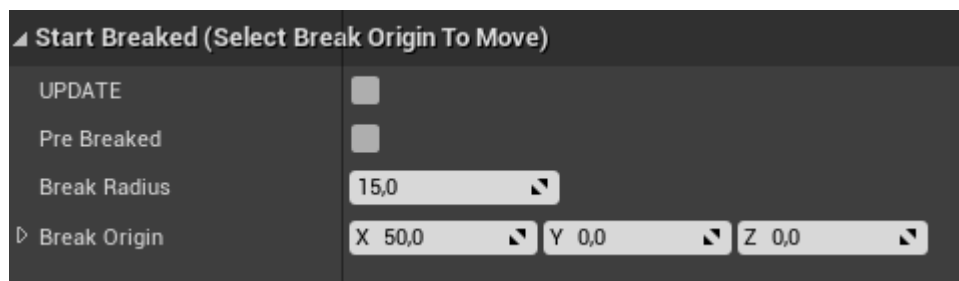
**Normal Detail:** Select normal map for the glass.

**Normal Detail Size:** Set the size for the normal map

**Normal Detail Intensity:** Set the intensity for the normal map.

**Use Shadow Texture:** Cast shadows with details (Details are determined by texture used in Normal Detail).

**Detail Shadow Opacity:** Determines the opacity for the casted shadow detail.

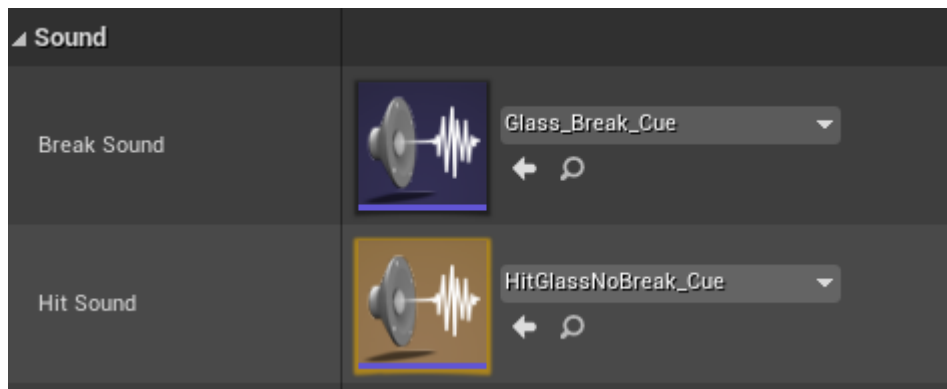


**UPDATE:** You need to check this to apply the changes from this section.

**Pre Broken:** Determines if the glass is pre broken or not.

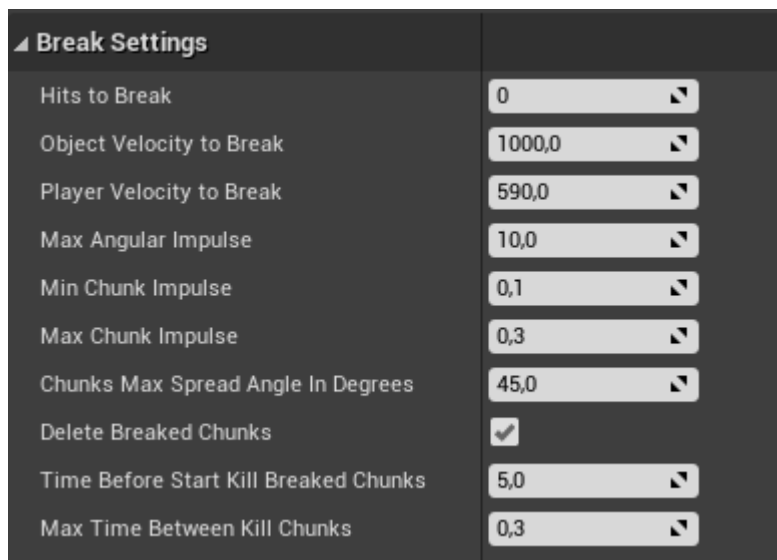
**Break Radius:** Determines the radius for the pre broken glass.

**Break Origin:** Determines the origin position for the pre broken glass. (Select break origin to move this parameter).



**Break Sound:** Select the sound for when the glass is broken and pieces hit.

**Hit Sound:** Select the sound for when the glass is hit but not broken.



**Hits To Break:** How many hits need the glass to be broken.

**Object Velocity to Break:** The object needs to travel at more velocity than this to break the glass

**Player Velocity to Break:** Player needs to go faster than this to break the glass.

**Max Angular Impulse:** The base angular impulse when breaking the glass.

**Min Chunk Impulse:** The minimum base impulse when breaking the glass.

**Max Chunk Impulse:**The minimum base impulse when breaking the glass.

**Chunks Max Spread Angle In Degrees:** How many degrees pieces will be spread from the break origin. (Like a cone).

**Delete Broken Chunks:** Determines if the pieces will be deleted when they are broken.  
(Deprecated)

**Time Before Start Kill Broken Chunks:** Elapsed time before starting to delete broken pieces.

**Max Time Between Kill Chunks:** Max time between each broken piece to be deleted.

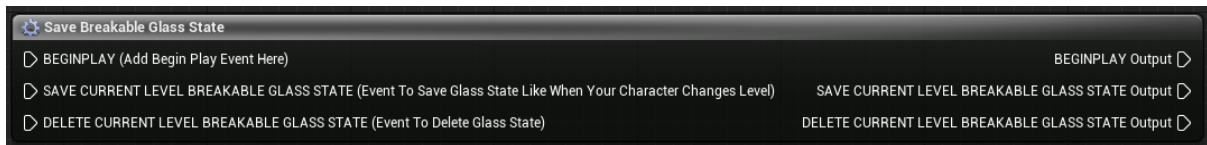
#### **4. Save, load and delete**

You can store the state for each glass into an external file for each level.

The state is stored in:

*("Saved/SaveGames/MapName\_BreakableGlass.sav")*

To save the state, you need to call the "Save Breakable Glass State" function from the actor you want to have a save event.



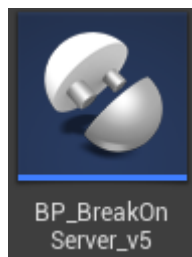
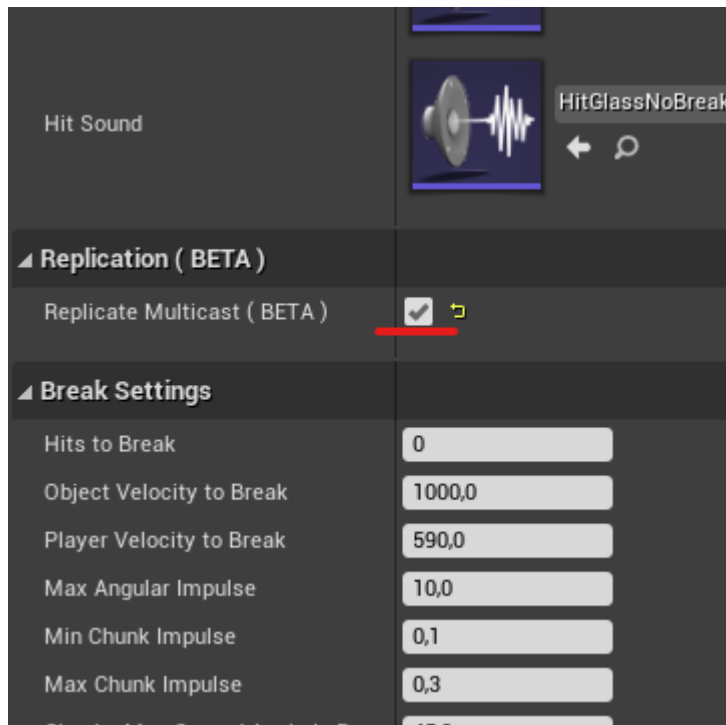
**BEGINPLAY:** You need to connect Beginplay event here.

**SAVE CURRENT LEVEL BREAKABLE GLASS STATE:** Connect the event you want to use to save the state. (like when change the level or when exit the game...).

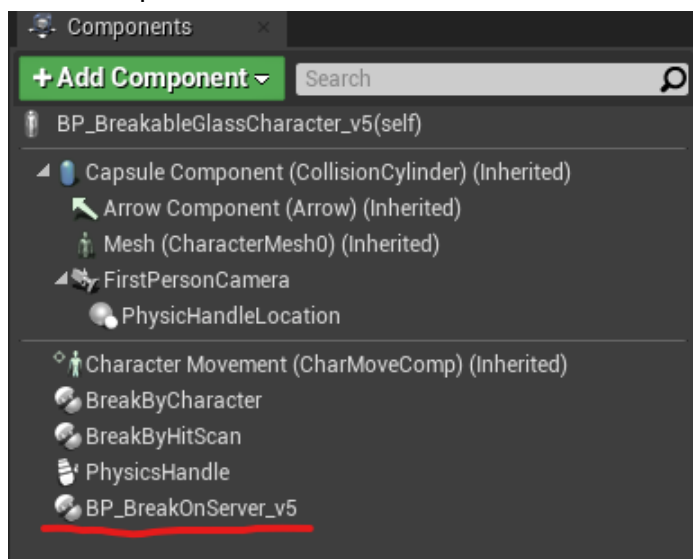
**DELETE CURRENT LEVEL BREAKABLE GLASS STATE:** Connect the event you want to use to delete the current level state.

## 5. REPLICATION (BETA)

For the glass to be replicated, it is necessary to check the box "Replicate Multicast (Beta)" in the actor.



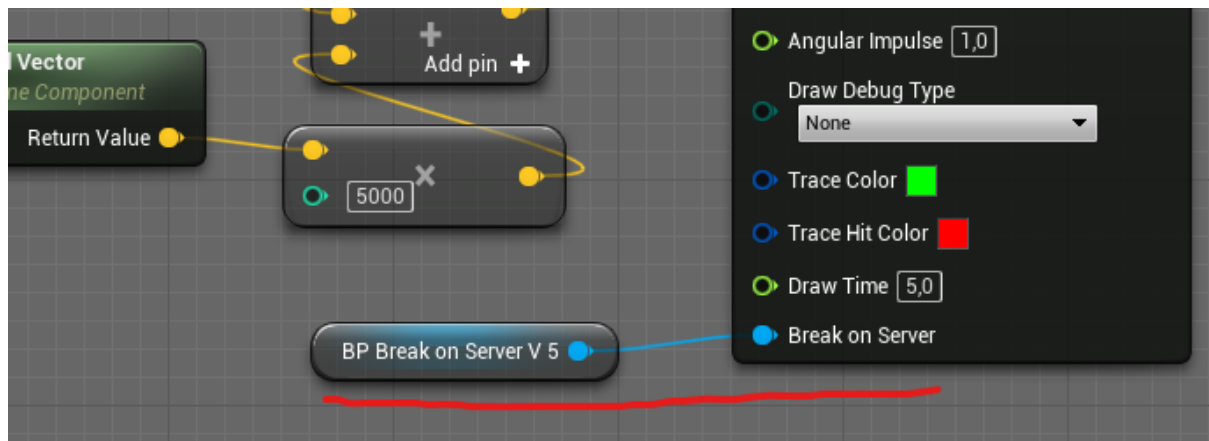
To replicate the glass break it is necessary to add the component "BP\_BreakOnServer\_v5" in the blueprint of the character.



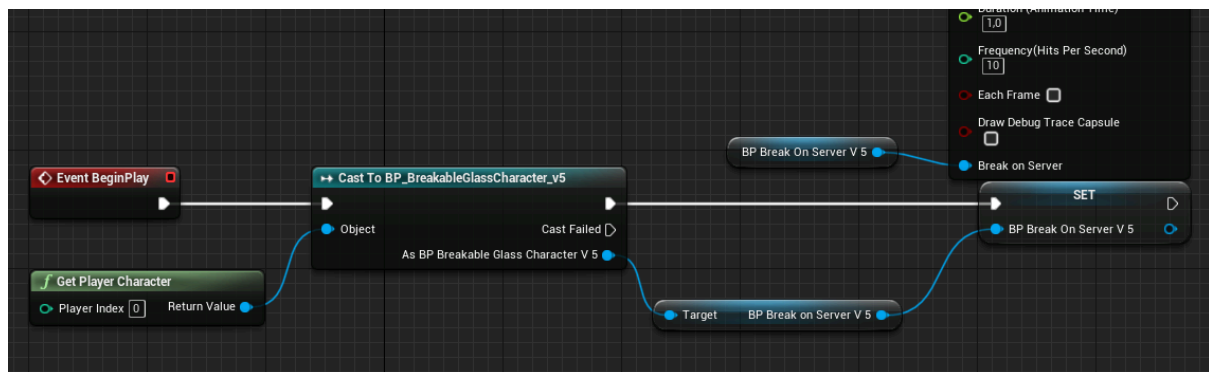
The character is in charge of notifying the server about the breaking of the glass and the server is in charge of communicating the breakage to the rest of the clients (MULTICAST).

So for the components in charge of breaking the glass can send the information to the server, it's necessary to pass them the reference of this component.

To call the server from the components inside the character, you only have to connect the reference of "BP\_BreakOnServer\_v5" in the function of said component.

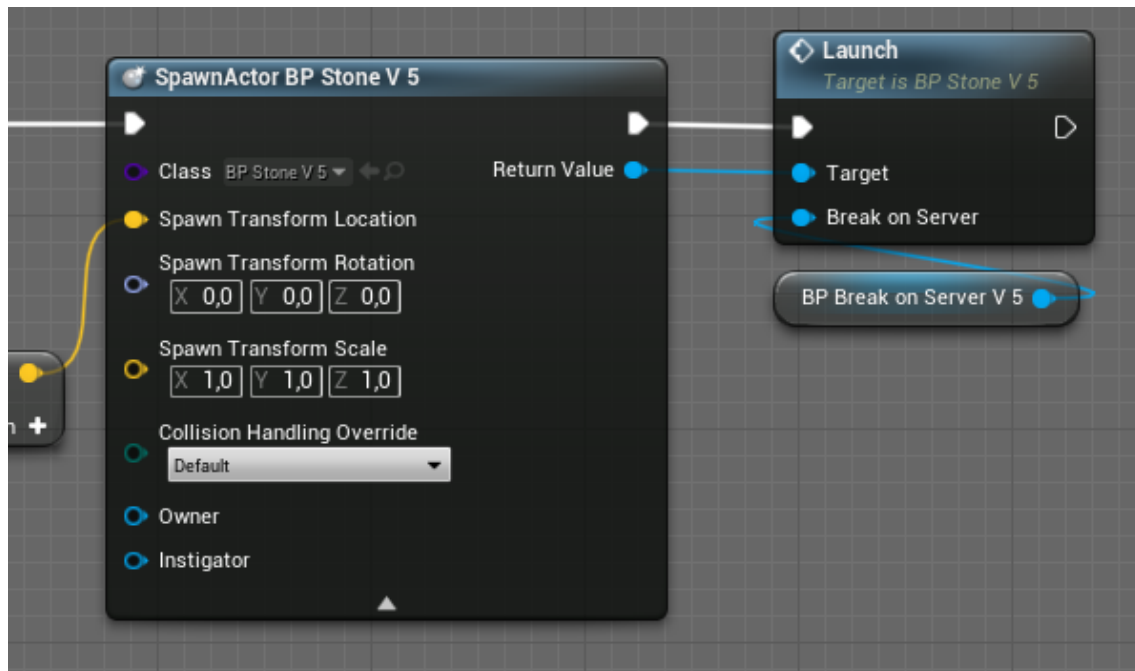


To call the server from components that are not inside the character you need to get the reference by casting to the character that has the component.



To call the server from components that are not inside the character but are spawned by it, they can get the reference directly.

(BP\_PlayerCharacter)



(BP\_Object)

