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1.Introduction

Axis Studio not only allows the export of motion capture data but also be able to stream motion capture data in real-time to third party applications, making the data available to drive characters in animation.

Axis studio act as a server on a network and stream motion capture data live to a client PC running a client application. In this document specifically go through the process about streaming data to UE4 from Axis Studio with the NeuronLiveLink Plugin.

1.1 Features

- Support UE4 version 4.25.0
- Support to receive and process the props (PWR-tracker) motion capture data (refer to our VPS project)
- Support to drive a skeleton that is not using T-pose based model, such as A-pose based model.
- Support to receive and process the displacement data from Axis Studio
- Add **Neuron Live Link Content** which including:
 - ◆ MaximoLiveLinkRemapAsset (Select PN/PN Pro Skeleton in Axis Studio)
 - ◆ StudioLiveLinkRemapAsset (Select PNS Skeleton in Axis Studio)
 - ◆ Robot (Notiom sample FBX skeletal mesh and sample Animation Blueprint)
- Modify Remote address to 127.0.0.1 as default in the Live Link Streaming Manager.

1.2 Known issues

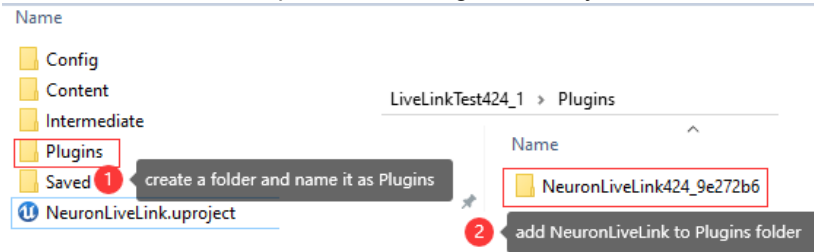
- Error may occur when run executable after packaging.

1.4 About

1. Supported Development Platforms: Win64
2. Supported UE4 Version: 4.25.0

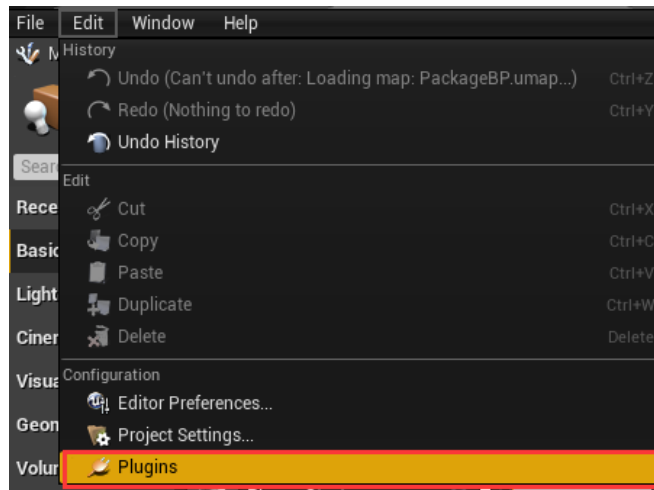
2. Installation

1. Create a Plugins folder in your Unreal Engine Project
2. Extract **NeuronLiveLink** zip file to the Plugins folder you created.

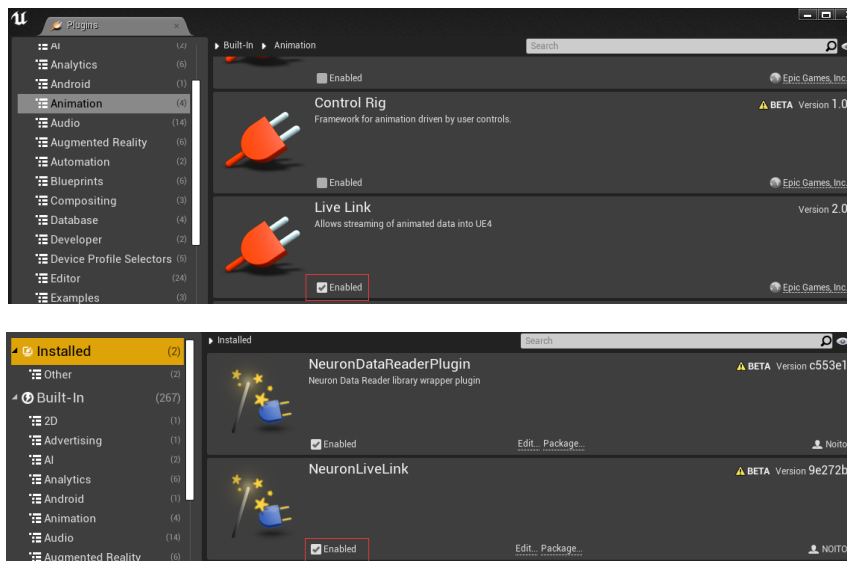


3.UE4 Project Setup

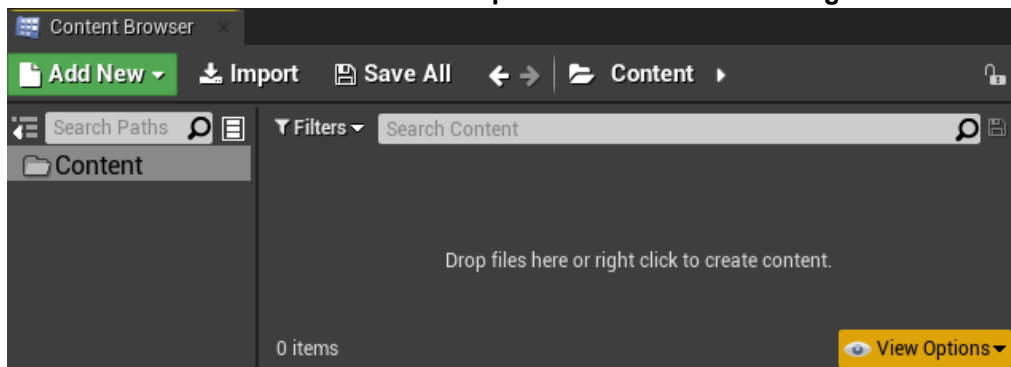
1. Inside your UE4 project, from the **Menu Bar** under **Edit**, select **Plugins**.

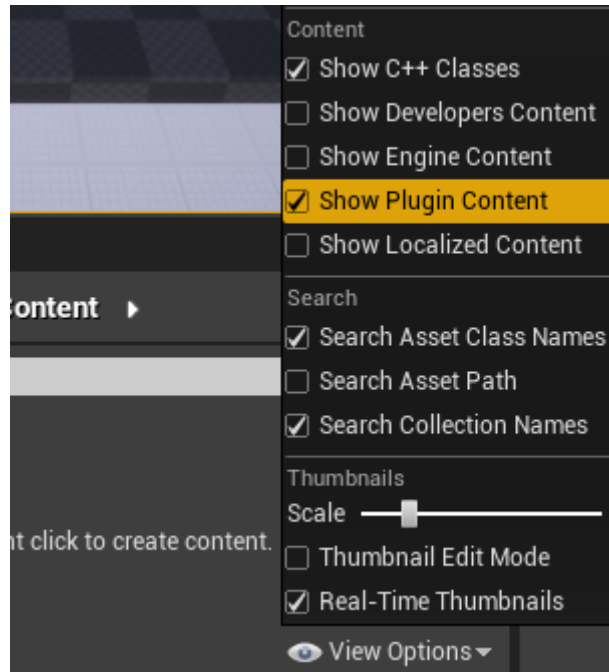


2. Under the Animation section, click Enabled for Live Link and under the Installed section, click Enabled for NeuronLiveLink then restart the Editor.



3. In the Content Browser Click **View Option** and enable **Show Plugin Content**.

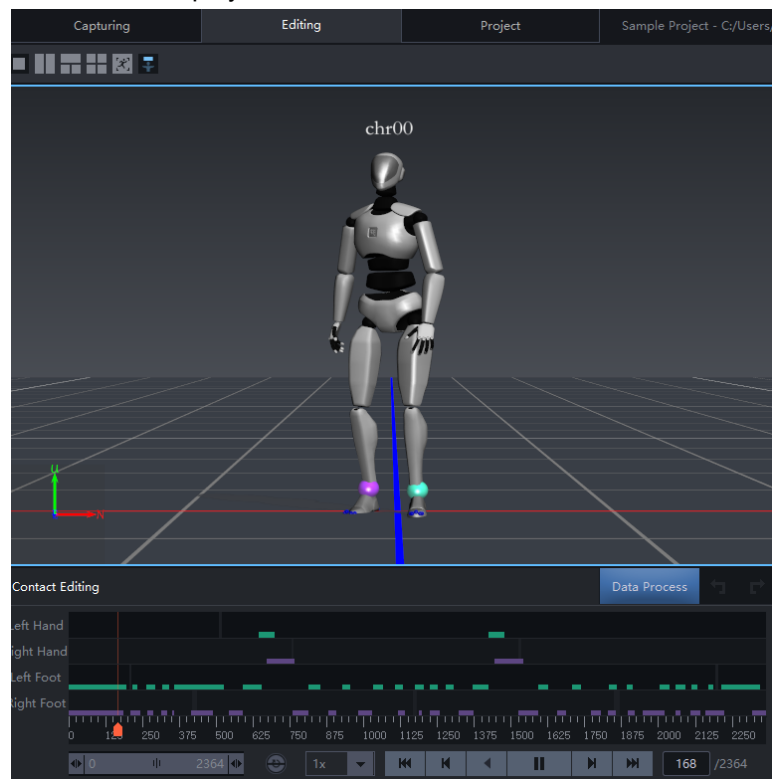




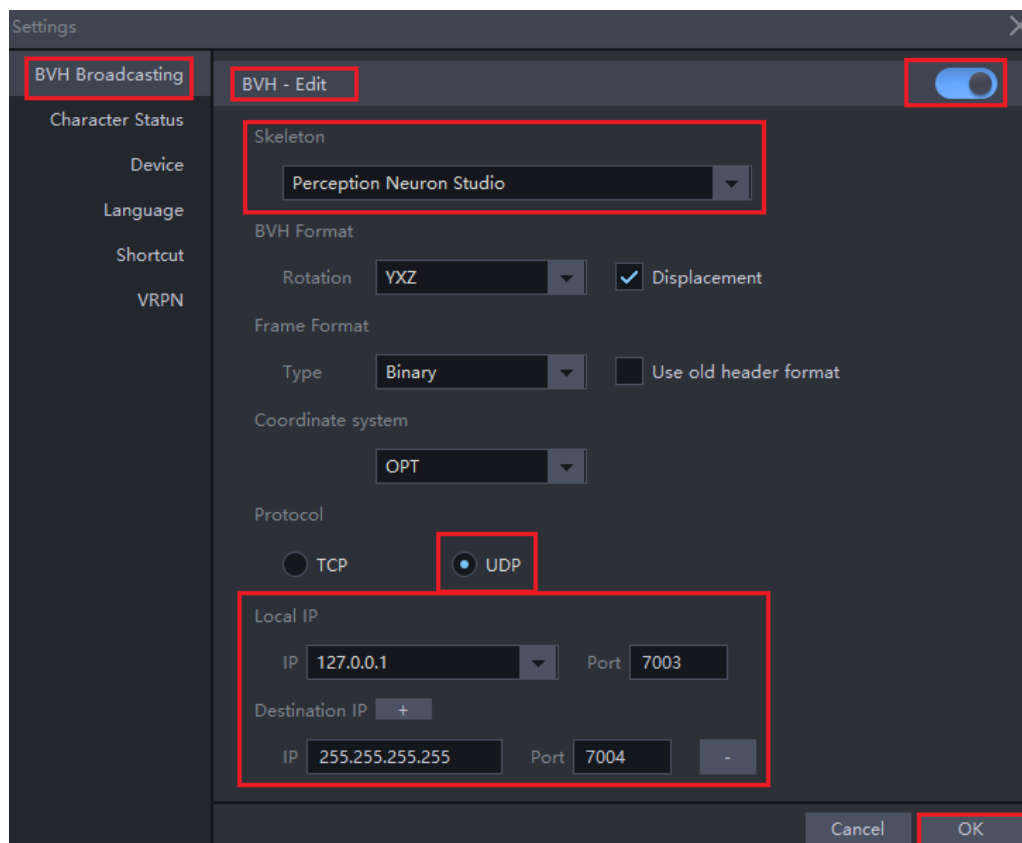
Note: This will enable the Live Link Plugin, which can be used to connect to external Digital Content Creation (DCC) tools. In order for your DCC tool to connect to UE4, you will need to enable the corresponding plugin. In this section, we are establishing a connection with Axis Studio.

4.Quick Start

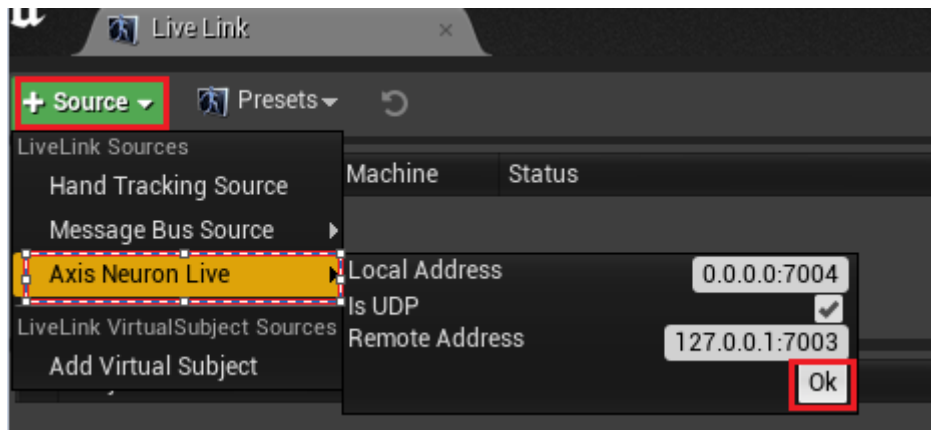
1. Open Axis Studio and Replay a file.



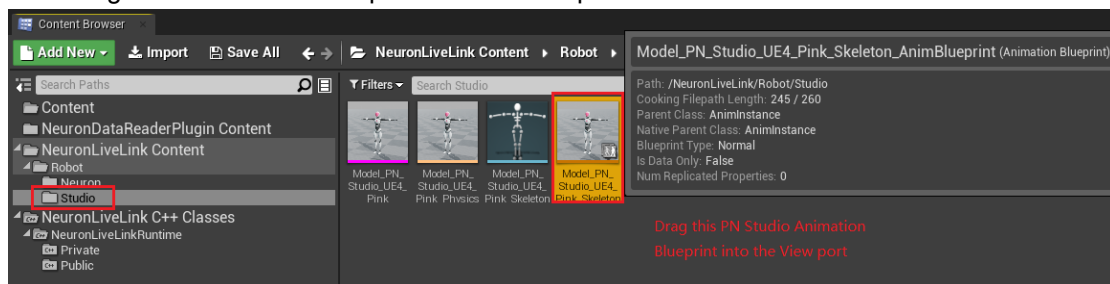
2. Go to Menu >Settings >BVH Broadcasting and Enable BVH-Edit



3. Open the Live Link Streaming Manager and Add Axis Neuron Live source.



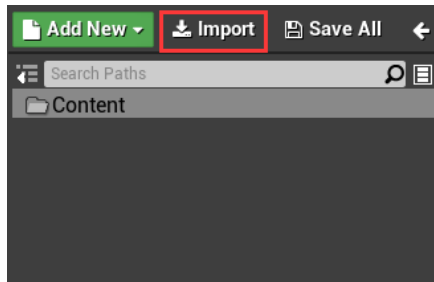
4. Drag PNS Animation Blueprint into the viewport.



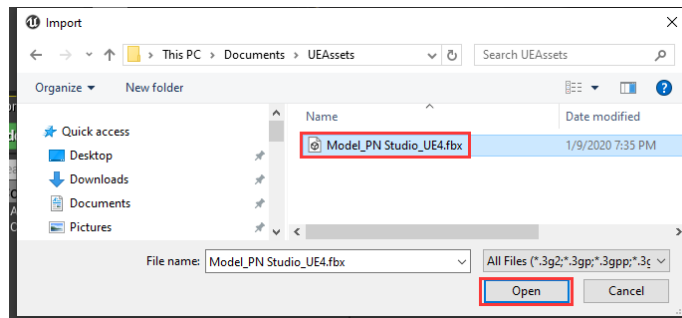
5. Click play button to see your animation.

5.Import Skeletal Mesh.

1. In the Content Browser Click Import button.

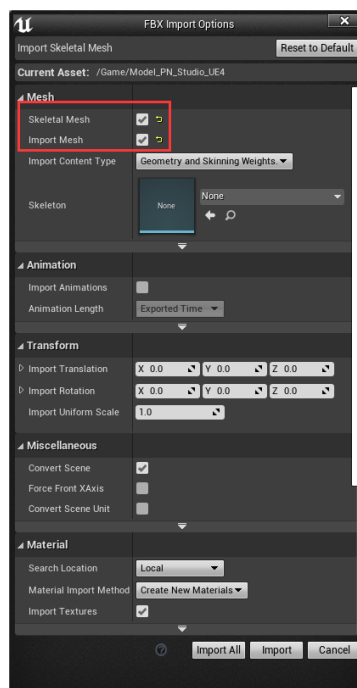


2. Locate and select the FBX file you want to import.



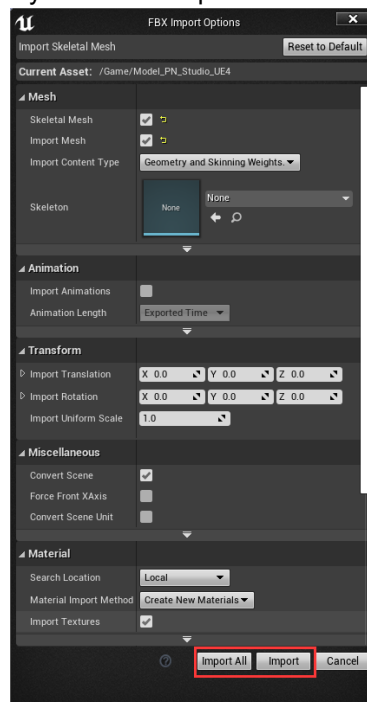
3. Click **Open** to begin importing the mesh file to your project.
4. In the **FBX Import Options** dialog box, choose the appropriate settings, making sure that the **Skeletal Mesh** option is enabled.

Note: If no existing Skeleton is selected, a new one will be created from the Skeletal Mesh being imported. The new Skeleton's name will be that of the Skeletal Mesh with Skeleton appended.



5. Click Import or Import All to import the mesh to your project and select the FBX file

containing the character you wish to import.

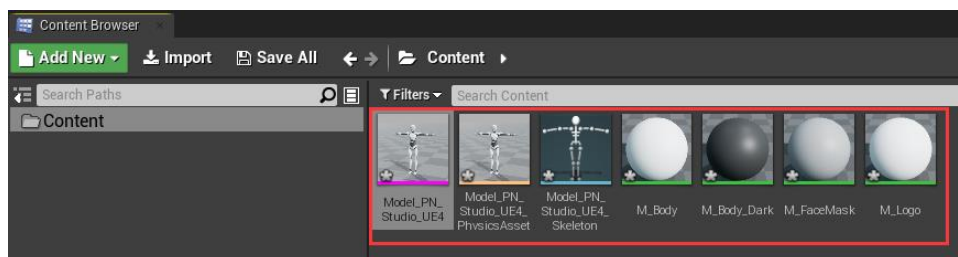


Note: this Tutorial we use Axis standard model **Model_PNStudio_UE4.fbx**, you can download here <https://support.neuronmocap.com/hc/en-us/articles/360006160713-Setup-For-Unreal-Engine-Plugin-for-Axis-Software->

 [Standard Robot for UNREAL mocap.zip](#)

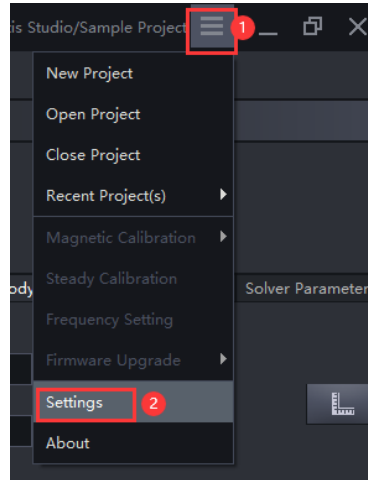
2 MB · [Download](#)

The resulting mesh is displayed in the Content Browser if the process was successful.

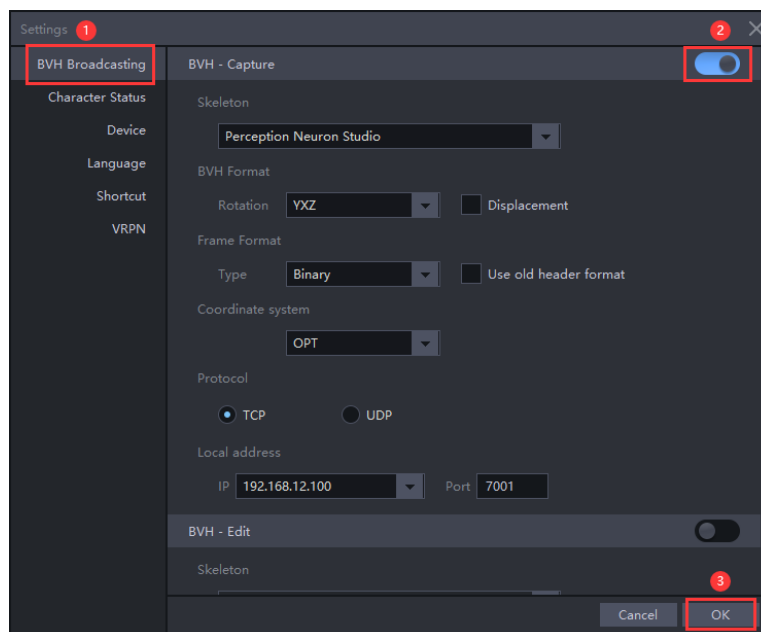


6.Axis Studio Setup

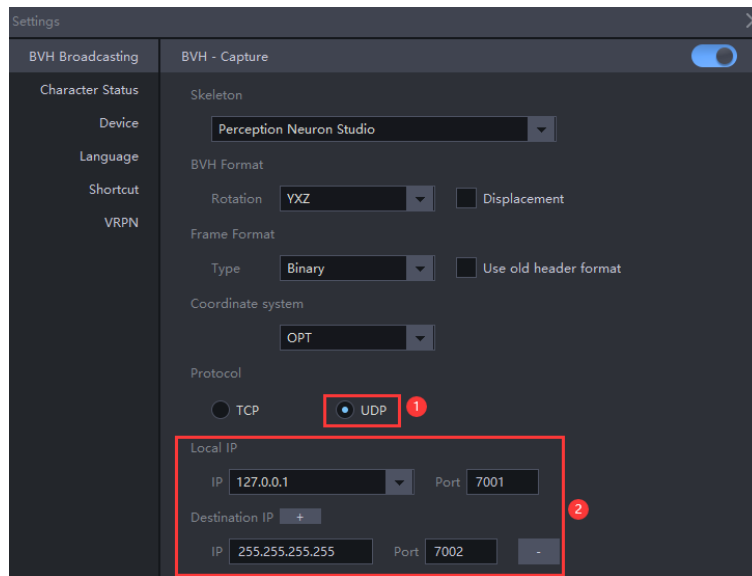
1. Launch Axis Studio and open a project
2. Go to Menu >Settings



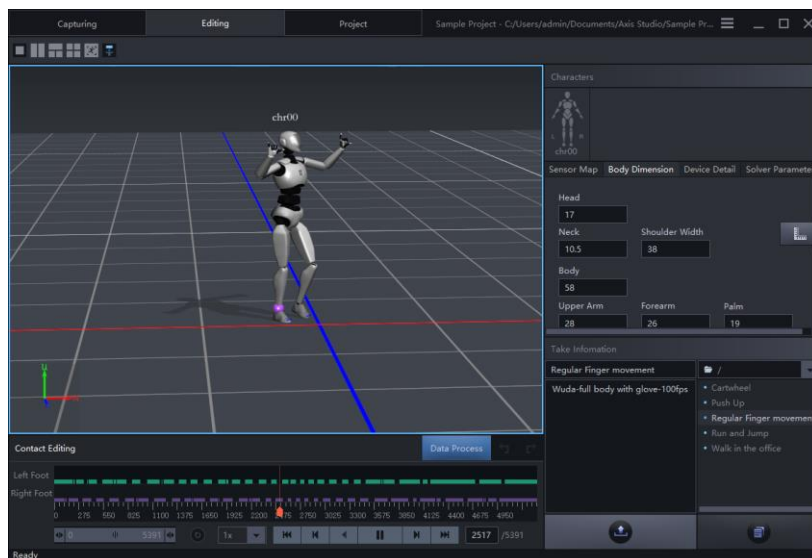
3. Navigate to BVH Broadcasting, enable BVH-Edit (or BVH-Capture)



Note: Enable BVH-Edit if you want to stream motion capture data from Editing and Enable BVH-Capture from Capturing viewport. Set network and other appropriate options, then click OK.

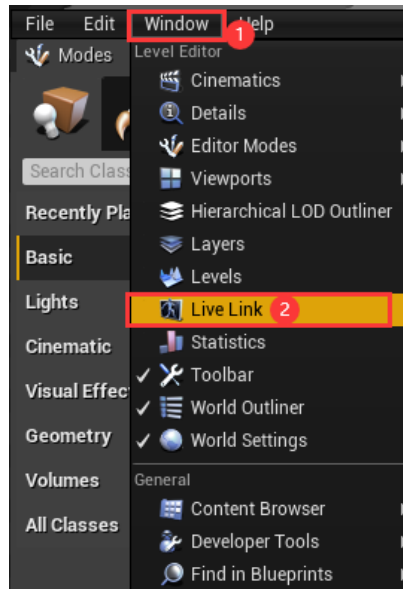


4. Connect PNS device or playback motion data.



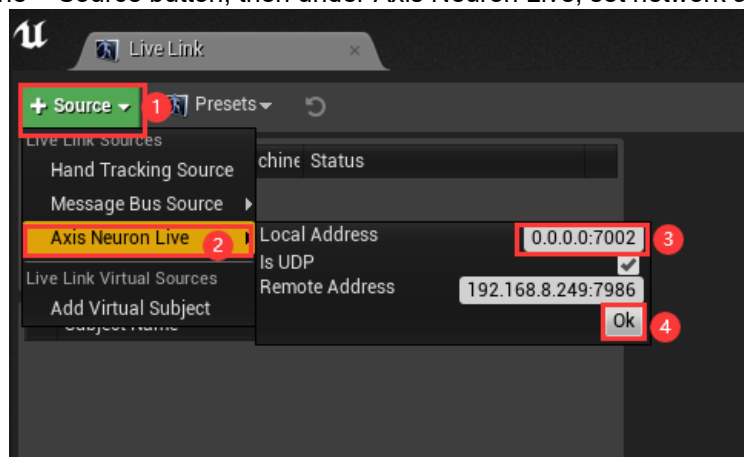
7.Live Link Plugin Setup.

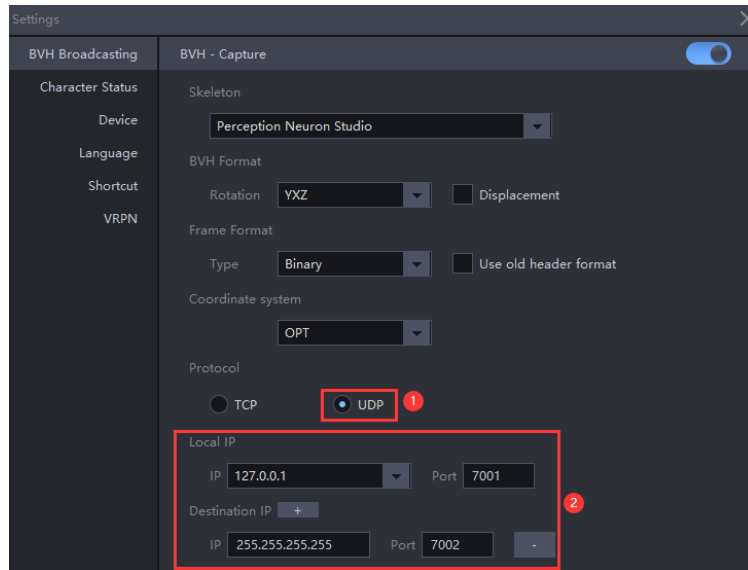
1. With Axis Studio running in the background, inside UE4 from the **File** Menu under **Window**, select **Live Link**.



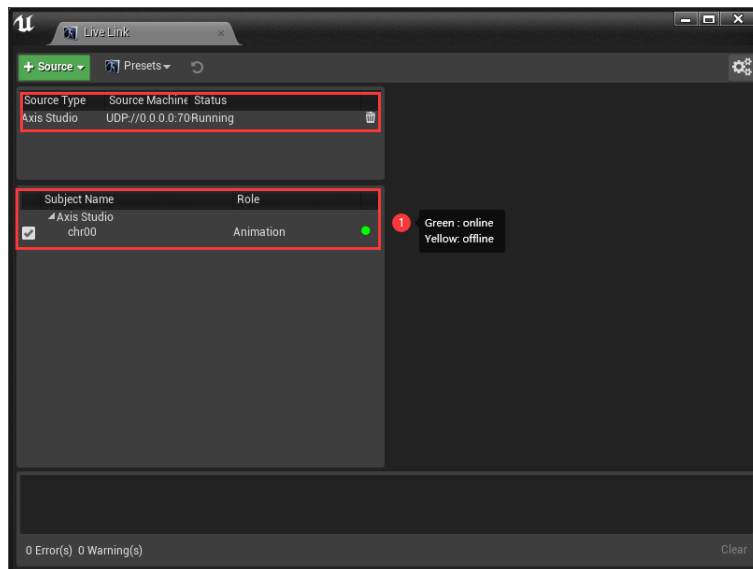
Note: This will open the Live Link Streaming Manager, which will enable you to connect to the running instance of Motion Builder.

2. Click the **+** Source button, then under Axis Neuron Live, set network and click Ok.



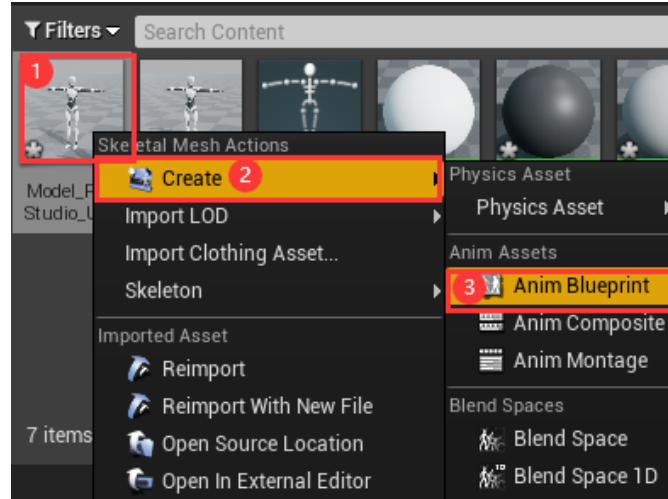


Note: Disable **Is UDP** if you use TCP protocol. The Streaming Manager will update to show the
 3. Connected Source Type and Subjects being streamed to UE4.

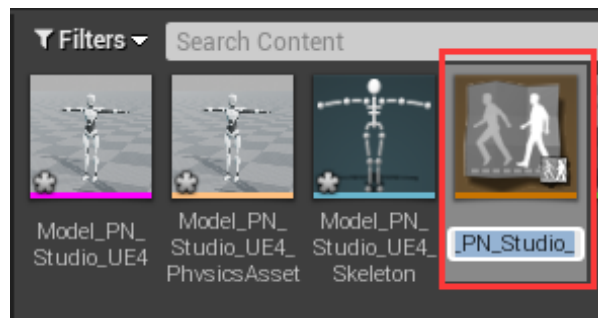


8.Manipulate Animation Blueprint Asset.

1. Right-click on the Skeletal Mesh you want the Animation Blueprint to target and click Create > Amin Assets > Amin Blueprint.

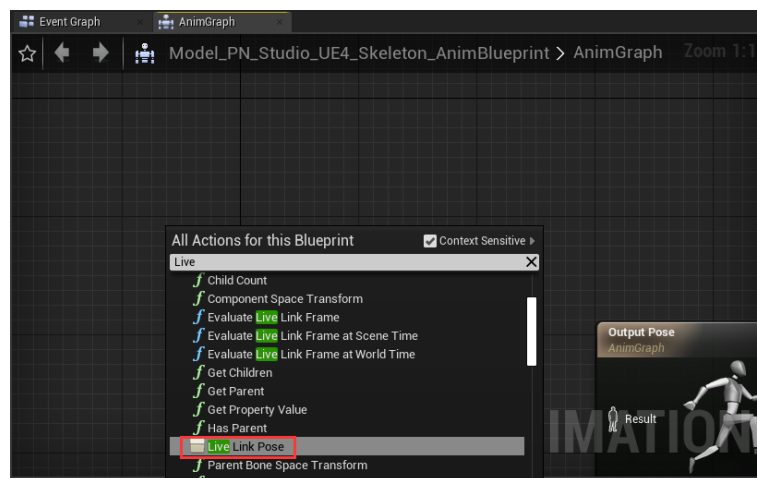


2. The Animation Blueprint is created in the same folder as the target Skeletal Mesh asset, with the name ready to be edited.

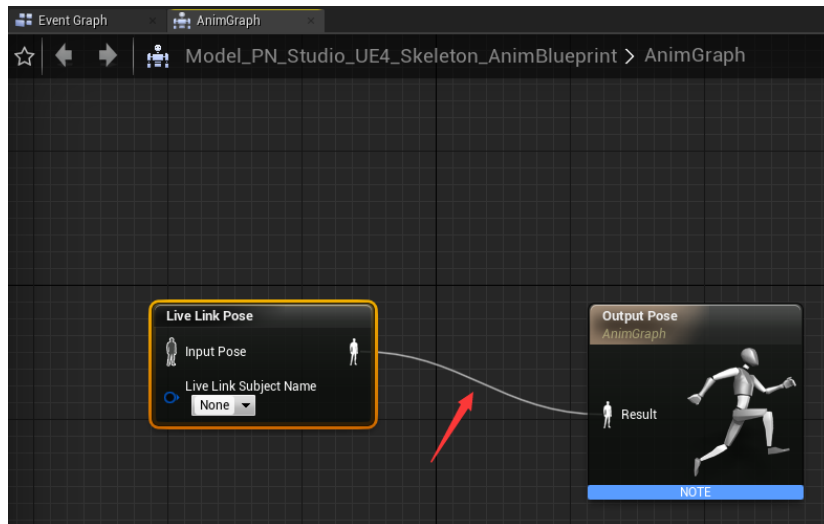


Note: If you want to, type a new name for the new Animation Blueprint and press **Enter**. Double click the Animation Blueprint you just created.

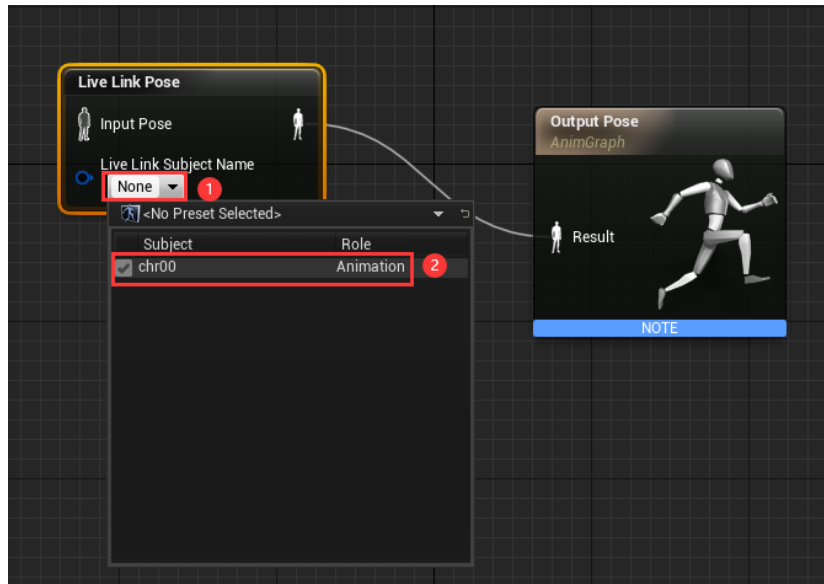
3. Right-click in AnimGraph to create Live Link Pose.



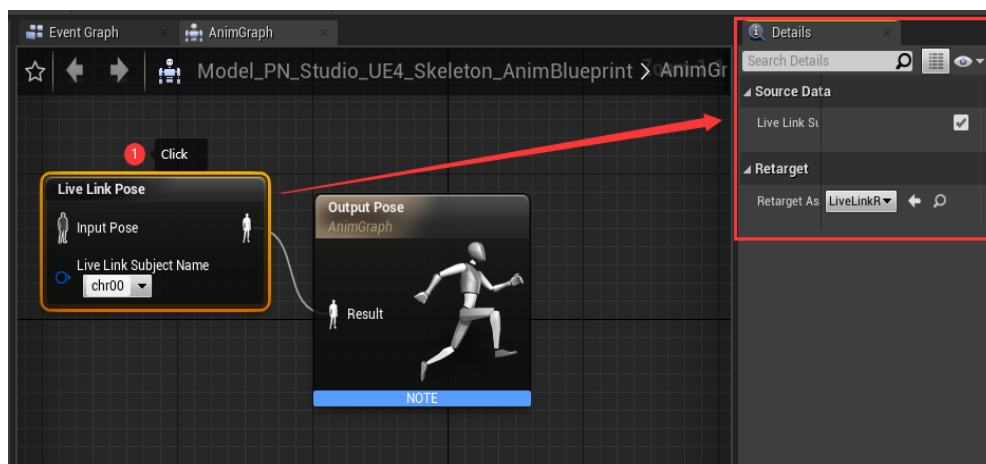
4. Connect Live Link Pose node to Output pose node.



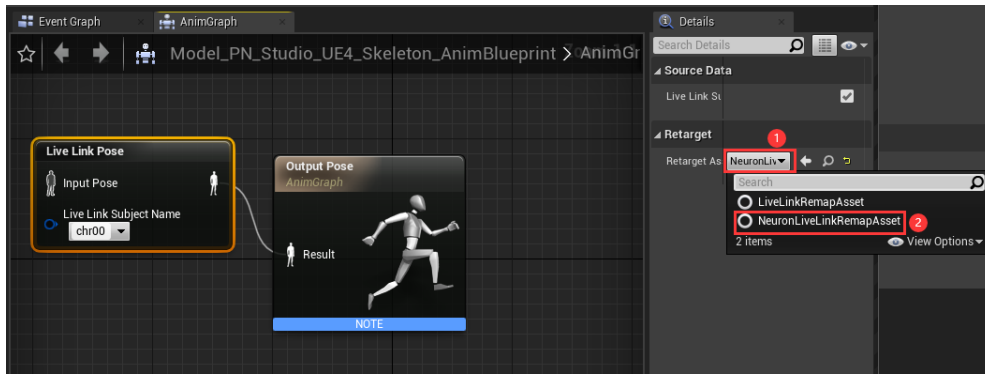
5. Click Live Link subject Name dropdown button and select subject.



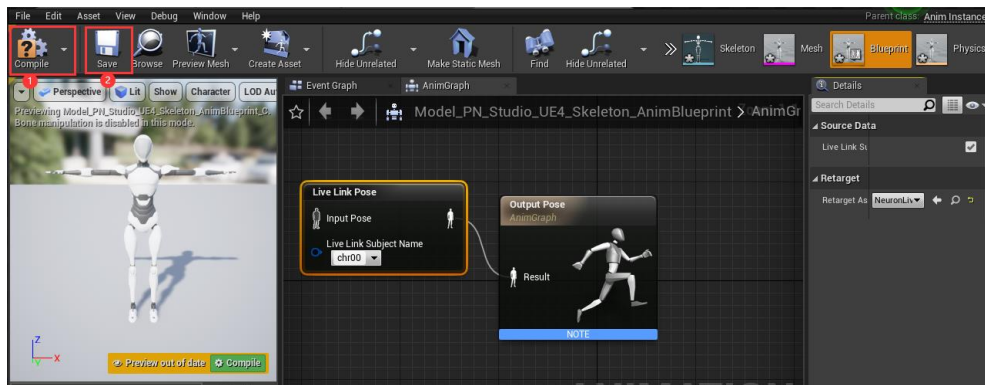
6. Click Live Link Pose and the Details panel displays.



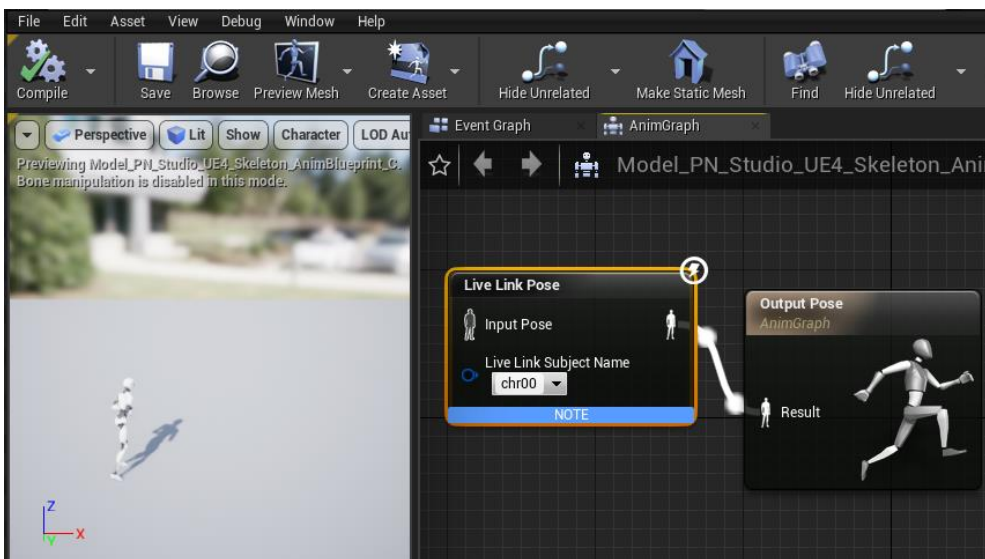
7. Click Retarget Asset dropdown button and select **NeuronLiveLinkRemapAsset**.



8. Click Compile and save.



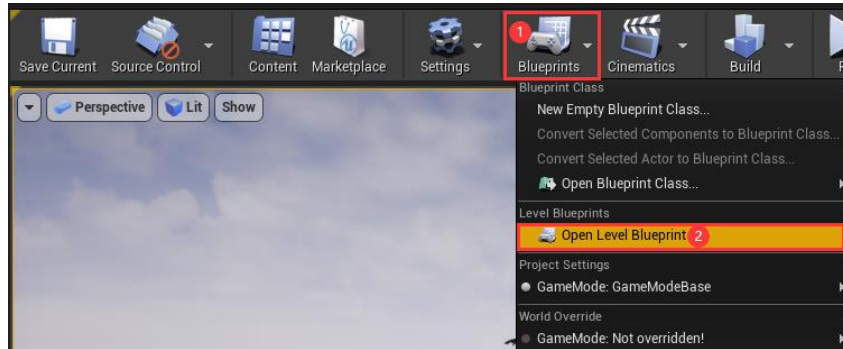
After all those setups correctly and you can preview the animation in the viewport now.



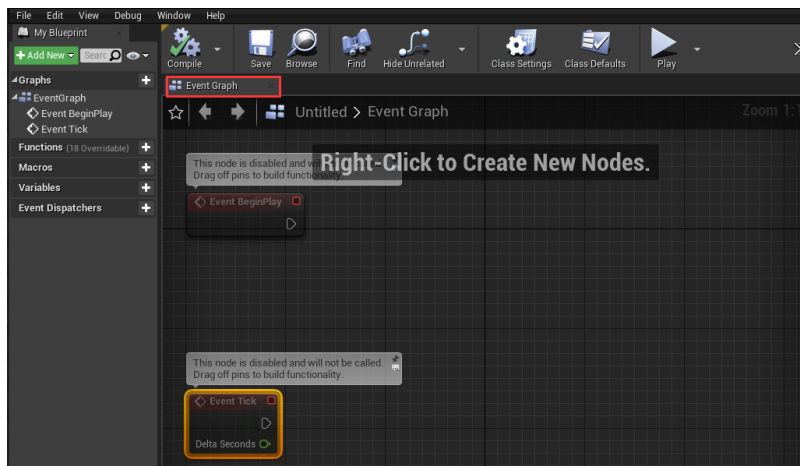
9. Projects Packaging

9.1 Implement animation driven.

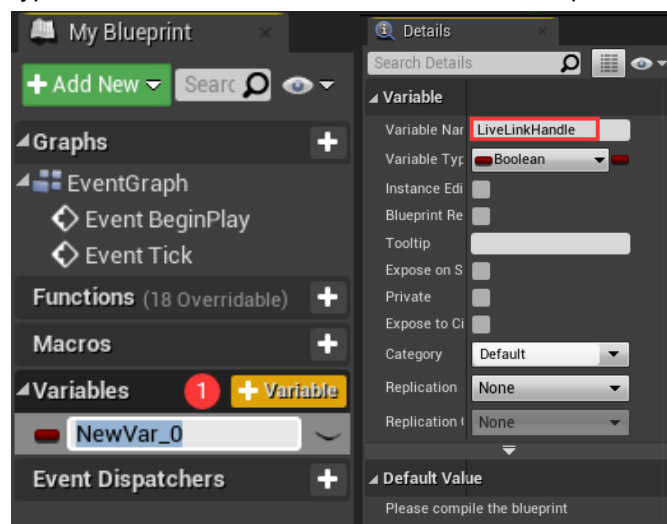
1. On the **Main Toolbar** click the **Blueprints** button then select **Open Level Blueprint**.



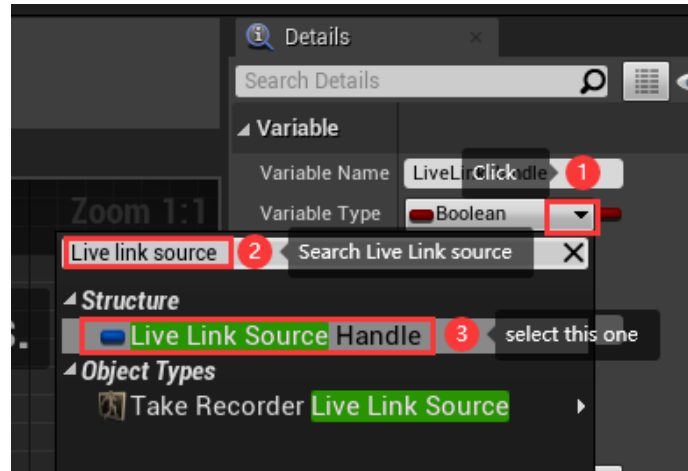
Note: Event Graph displays and with default nodes **Event BeginPlay** and **Event Tick**.



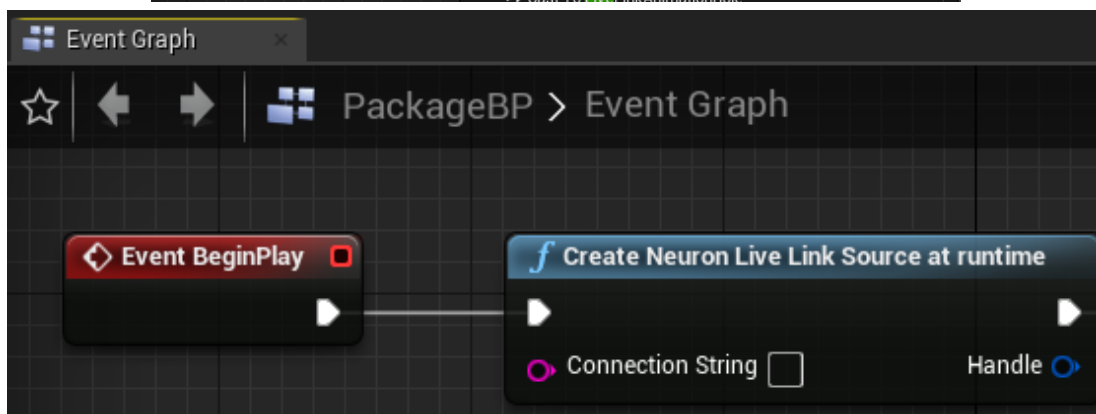
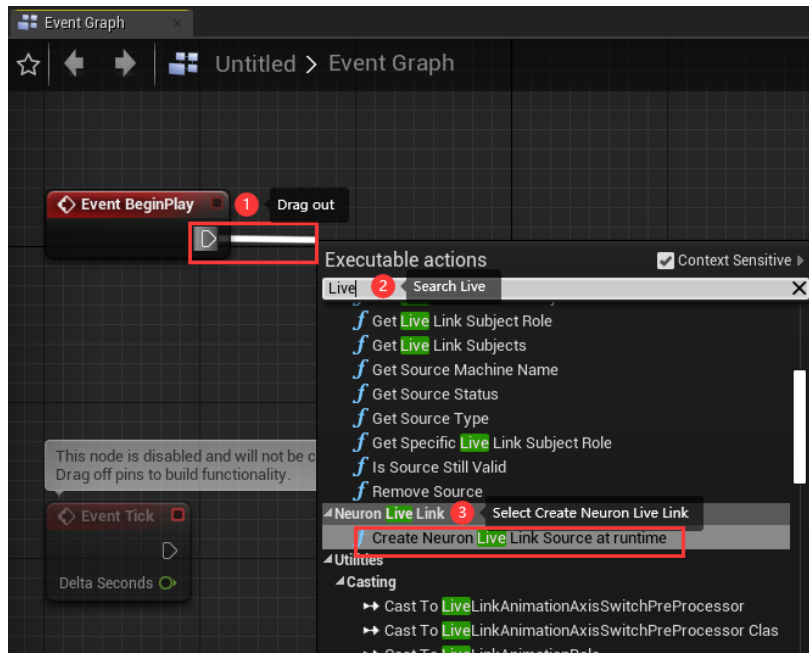
2. Move Mouse over **+** button, click **+Variable** button to add **Variable** in My Blueprint panel and type a new name for the Variable in the Details panel and press Enter.



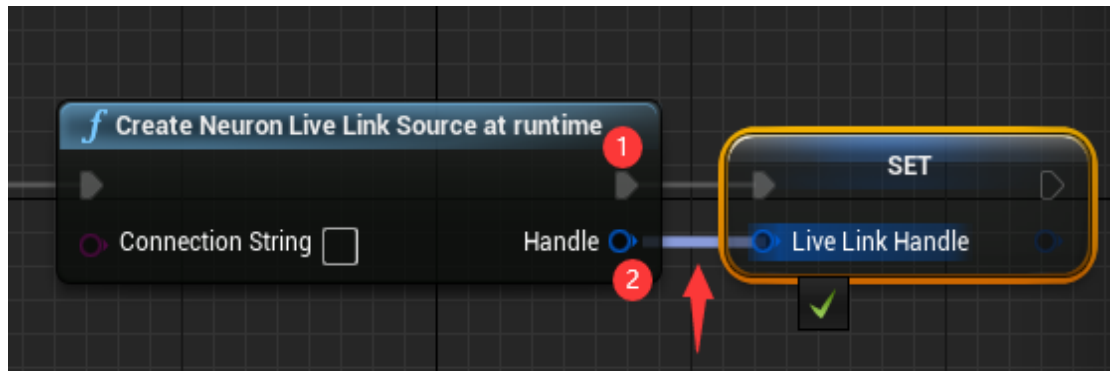
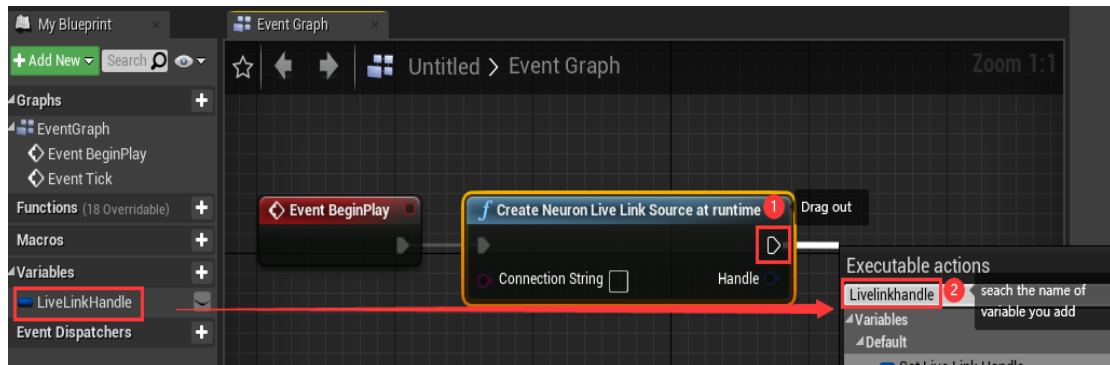
3. Set Variable Type as Structure (Live Link Source Handle) in the Details Panel.



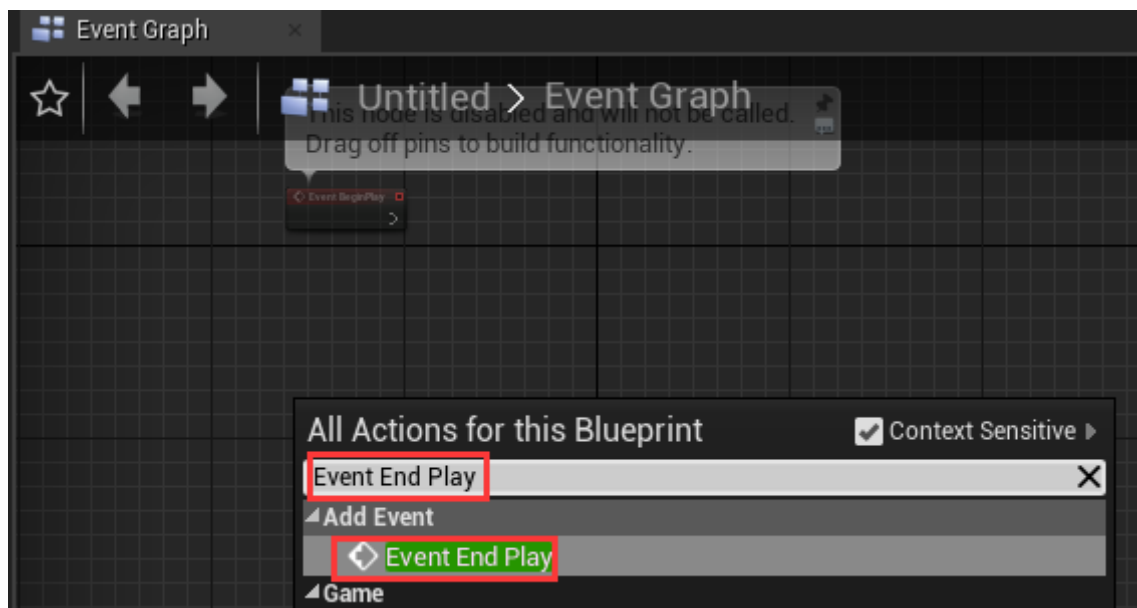
4. Create Neuron Live Link Source at runtime and connect it to **Event BeginPlay** in Event Graph.



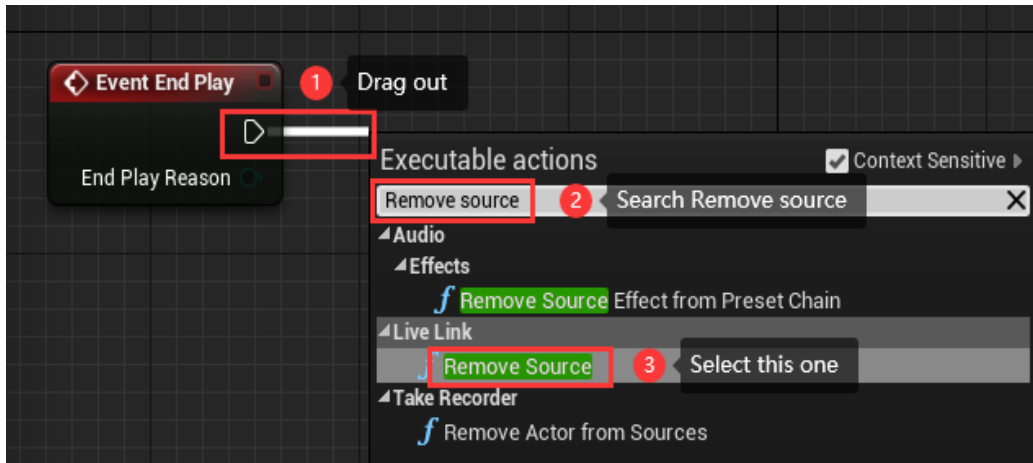
5. Create Set node and connect to Create Neuron Live Link Source at runtime.



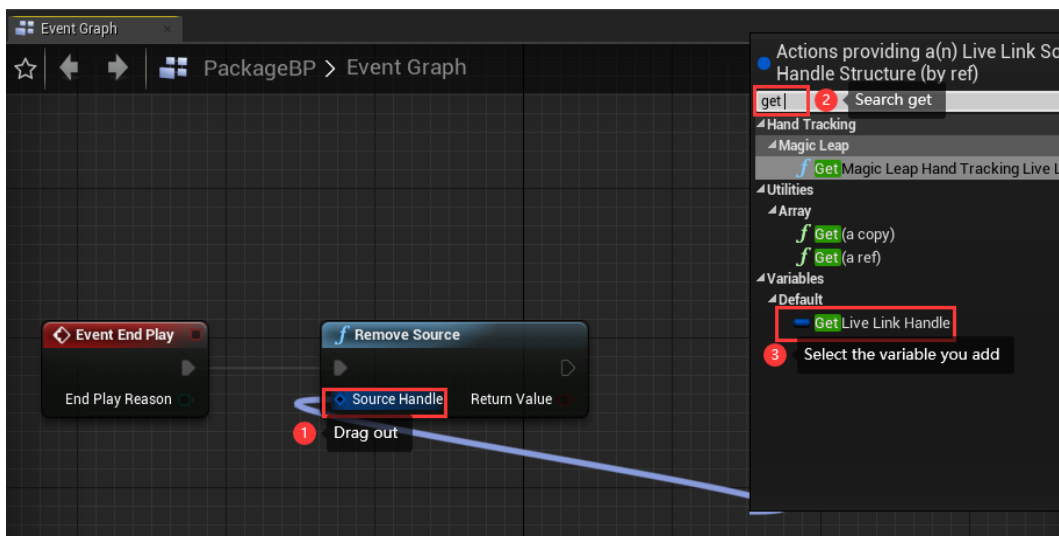
6. Right-Click to create **Event EndPlay**.



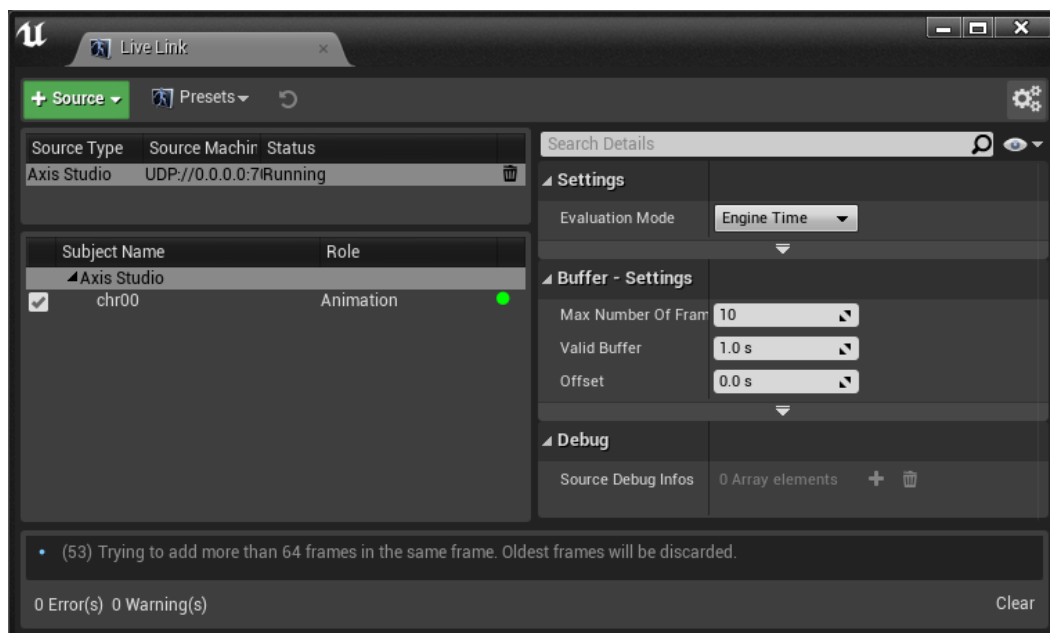
7. Create **Remove Source** and connect to **Event EndPlay** node.



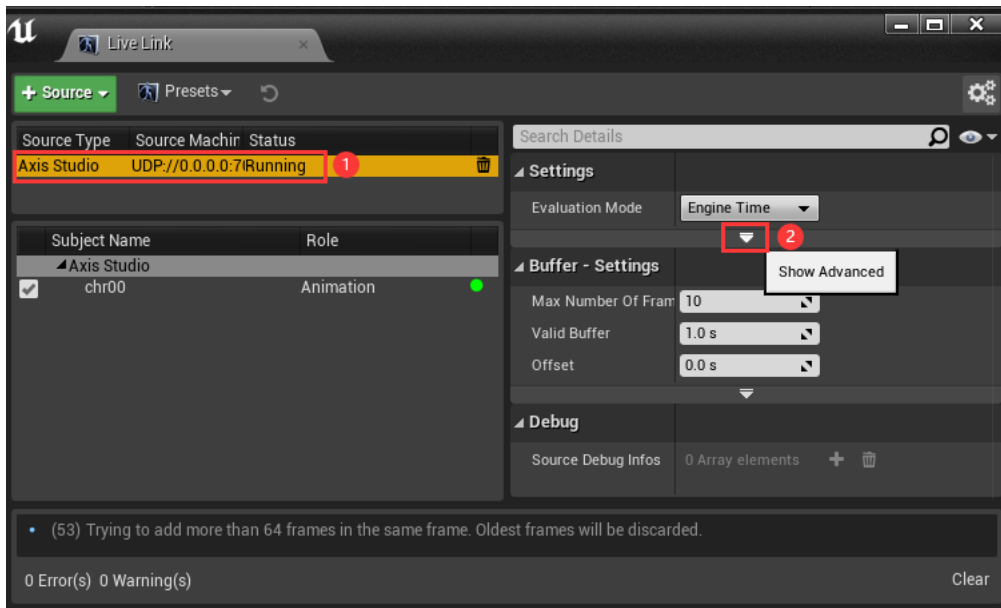
8. Create **Get** node and connect to **Remove Source** node.



9. Go back to Live Link Window to get Connection String.

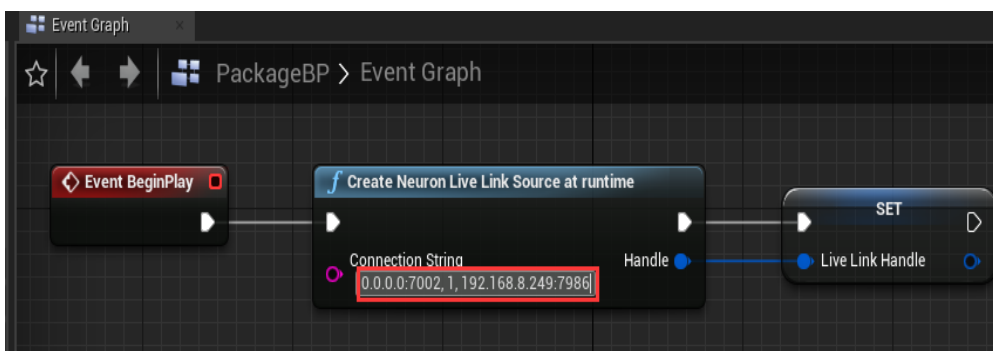
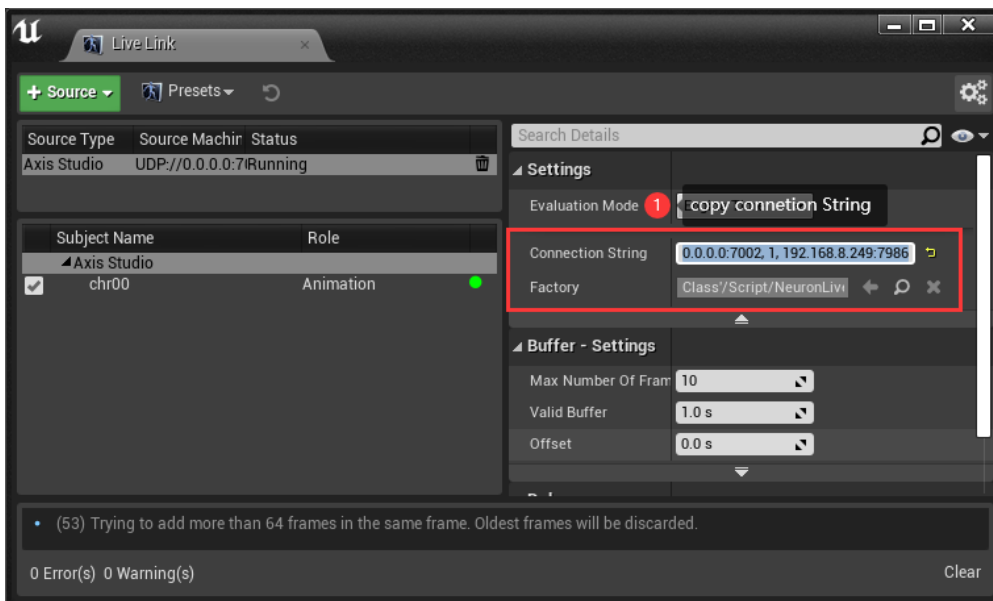


10. Select Axis Studio source and Click **Show Advanced** in Settings panel.

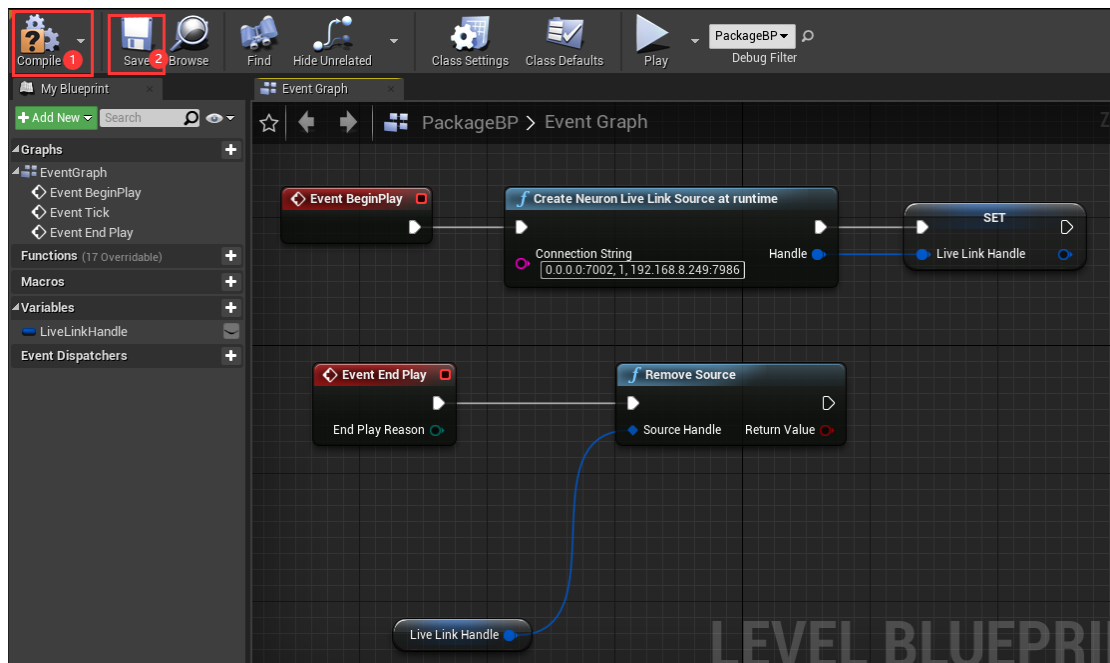


Note: Connect string and Factory will display in the Settings panel.

Copy Connection String in settings panel and paste it into Create Neuron Live Link Source at runtime node in Event Graph.



11. Click Compile and Save.



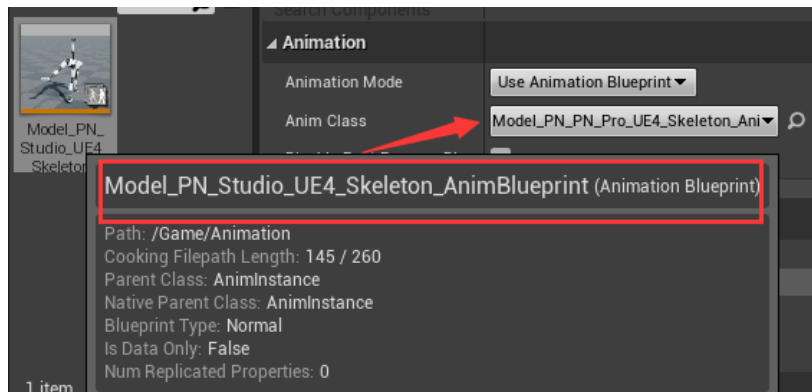
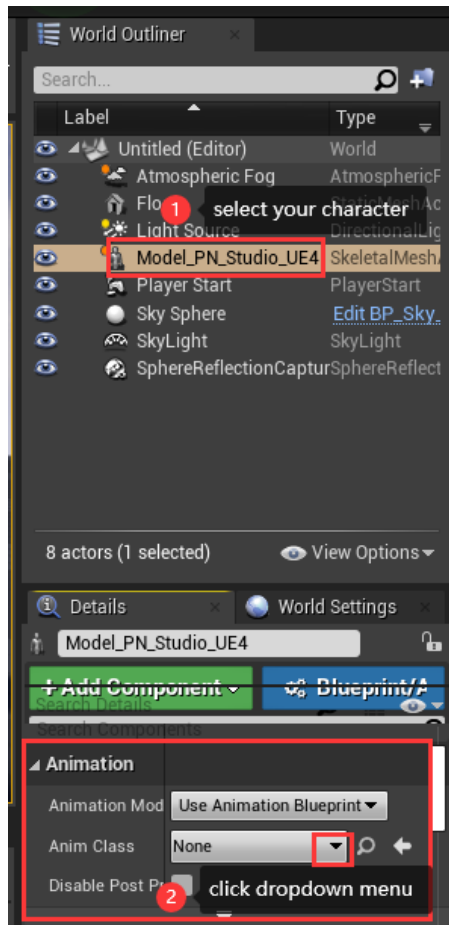
If you finish all setup above your character will be driven by the motion data from Axis studio when you hit the play button.

9.2 Animation setup

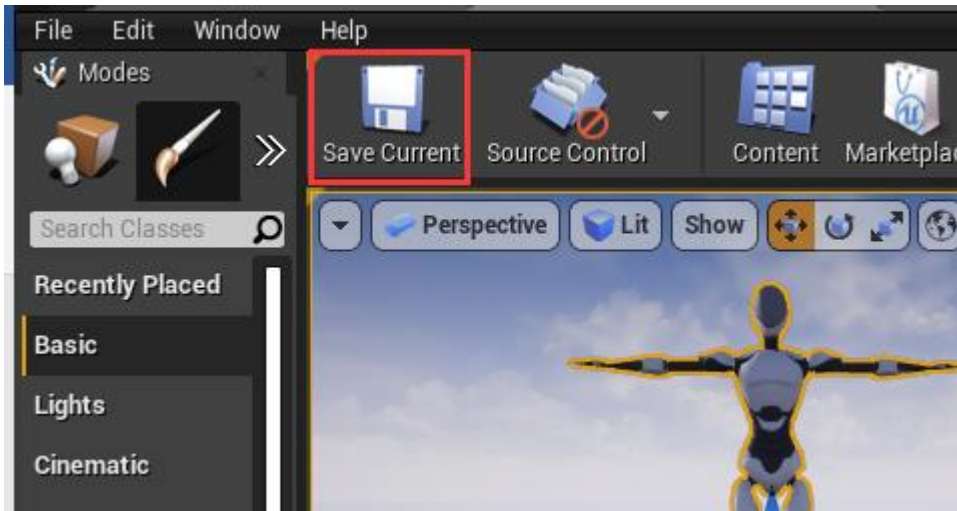
1. In the **Content Browser**, locate the Skeletal Mesh you want to add to the map as a Skeletal Mesh Actor.
2. Place it into the viewport.



3. Set Animation Class.



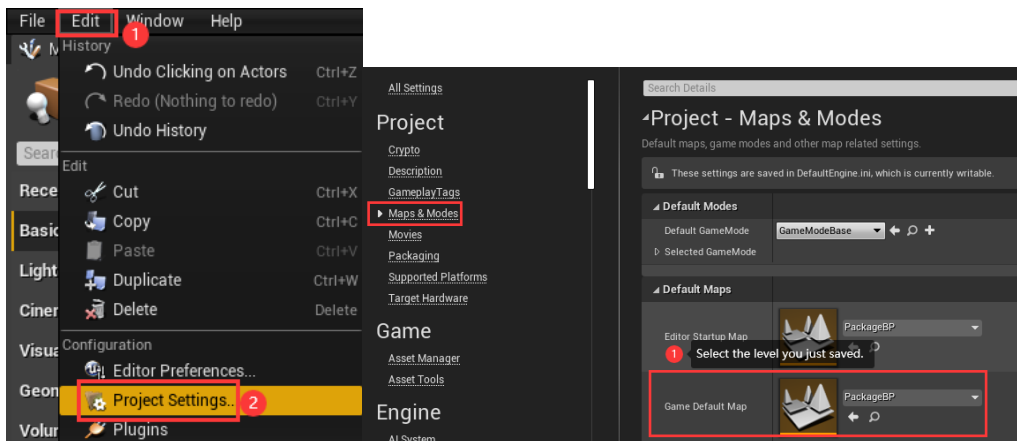
4. Click play button to see your animation.
 5. Click Save Current and type a name for it.
- Note: You can also drag your AnimationBlueprint into the viewport directly.



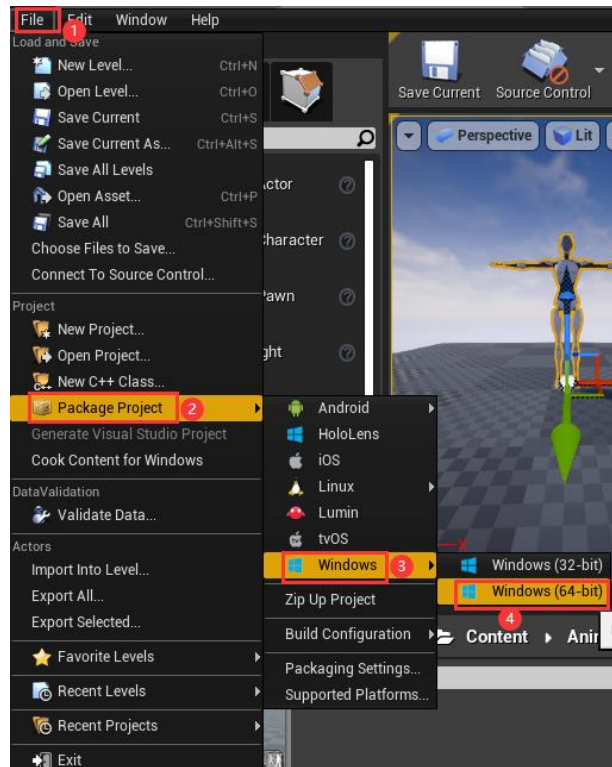
9.3 Game default map setup

Before packaging your game, you will first need to set a **Game Default Map**, which will load when your packaged game starts. If you do not set a map and are using a blank project, you will only see a black screen when the packaged game starts. If you have used one of the template maps, like the First-Person template or Third Person template, the starting map will be loaded.

1. Click on **Edit > Project Settings > Maps & Modes** in the Editor's main menu.



2. Click on **File > Package Project > [PlatformName]** in the Editor's main menu.



You will be presented with a dialog for selecting the target directory. If packaging completes successfully, this directory will then contain the packaged project.

10. Remapping Bone Name

Your Skeletal Mesh may use different skeleton with Axis standard skeleton. In this situation you cannot apply NeuronLiveLinkRemapAsset to LiveLinkPose for your animation need to create your own retarget asset for your s specific skeletal mesh. In this section we go through the setup process to create custom retarget asset.

The skeleton setup we use consist of the following 59 bones:

Axis Neuron:

1. Hips
2. RightUpLeg
3. RightLeg
4. RightFoot
5. LeftUpLeg
6. LeftLeg
7. LeftFoot
8. Spine
9. Spine1
10. Spine2
11. Spine3
12. Neck
13. Head
14. RightShoulder
15. RightArm
16. RightForeArm
17. RightHand
18. RightHandThumb1
19. RightHandThumb2
20. RightHandThumb3
21. RightInHandIndex
22. RightHandIndex1
23. RightHandIndex2
24. RightHandIndex3
25. RightInHandMiddle
26. RightHandMiddle1
27. RightHandMiddle2
28. RightHandMiddle3
29. RightInHandRing
30. RightHandRing1

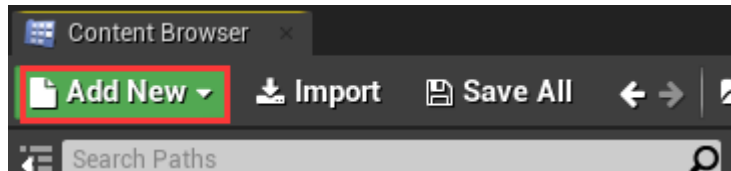
Axis Studio:

31. RightHandRing2
32. RightHandRing3
33. RightInHandPinky
34. RightHandPinky1
35. RightHandPinky2
36. RightHandPinky3
37. LeftShoulder
38. LeftArm
39. LeftForeArm
40. LeftHand
41. LeftHandThumb1
42. LeftHandThumb2
43. LeftHandThumb3
44. LeftInHandIndex
45. LeftHandIndex1
46. LeftHandIndex2
47. LeftHandIndex3
48. LeftInHandMiddle
49. LeftHandMiddle1
50. LeftHandMiddle2
51. LeftHandMiddle3
52. LeftInHandRing
53. LeftHandRing1
54. LeftHandRing2
55. LeftHandRing3
56. LeftInHandPinky
57. LeftHandPinky1
58. LeftHandPinky2
59. LeftHandPinky3

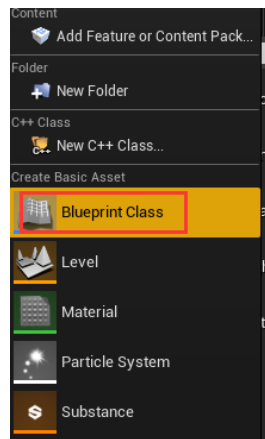
1. Hips
2. RightUpLeg
3. RightLeg
4. RightFoot
5. LeftUpLeg
6. LeftLeg
7. LeftFoot
8. Spine
9. Spine1
10. Spine2
11. Neck
12. Neck1
13. Head
14. RightShoulder
15. RightArm
16. RightForeArm
17. RightHand
18. RightHandThumb1
19. RightHandThumb2
20. RightHandThumb3
21. RightInHandIndex
22. RightHandIndex1
23. RightHandIndex2
24. RightHandIndex3
25. RightInHandMiddle
26. RightHandMiddle1
27. RightHandMiddle2
28. RightHandMiddle3
29. RightInHandRing
30. RightHandRing1

31. RightHandRing2
32. RightHandRing3
33. RightInHandPinky
34. RightHandPinky1
35. RightHandPinky2
36. RightHandPinky3
37. LeftShoulder
38. LeftArm
39. LeftForeArm
40. LeftHand
41. LeftHandThumb1
42. LeftHandThumb2
43. LeftHandThumb3
44. LeftInHandIndex
45. LeftHandIndex1
46. LeftHandIndex2
47. LeftHandIndex3
48. LeftInHandMiddle
49. LeftHandMiddle1
50. LeftHandMiddle2
51. LeftHandMiddle3
52. LeftInHandRing
53. LeftHandRing1
54. LeftHandRing2
55. LeftHandRing3
56. LeftInHandPinky
57. LeftHandPinky1
58. LeftHandPinky2
59. LeftHandPinky3

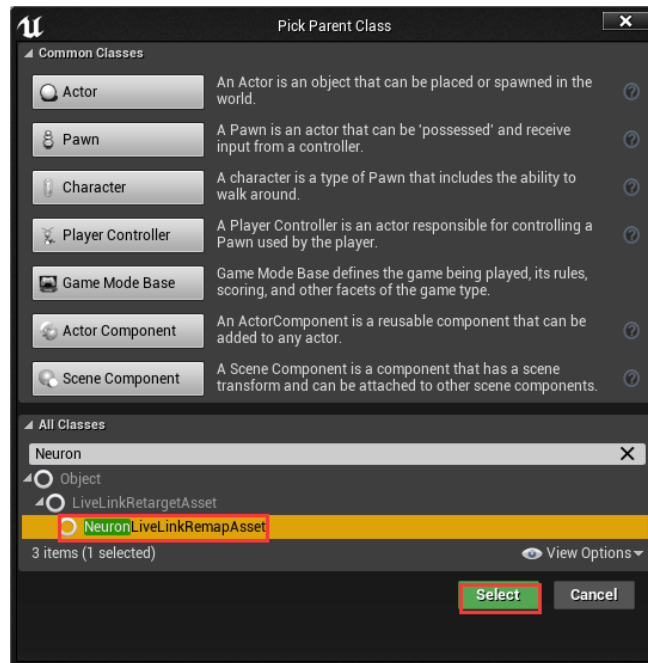
1. In the **Content Browser**, click the **Add New** button.



2. Select **Blueprint Class** from the **Create Basic Asset** section of the dropdown menu.

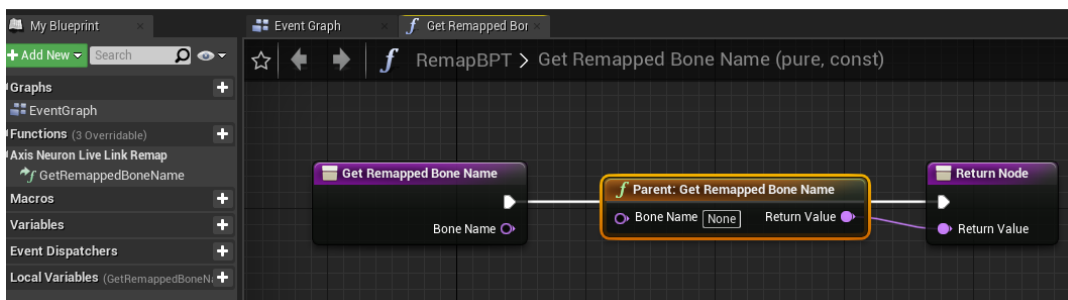
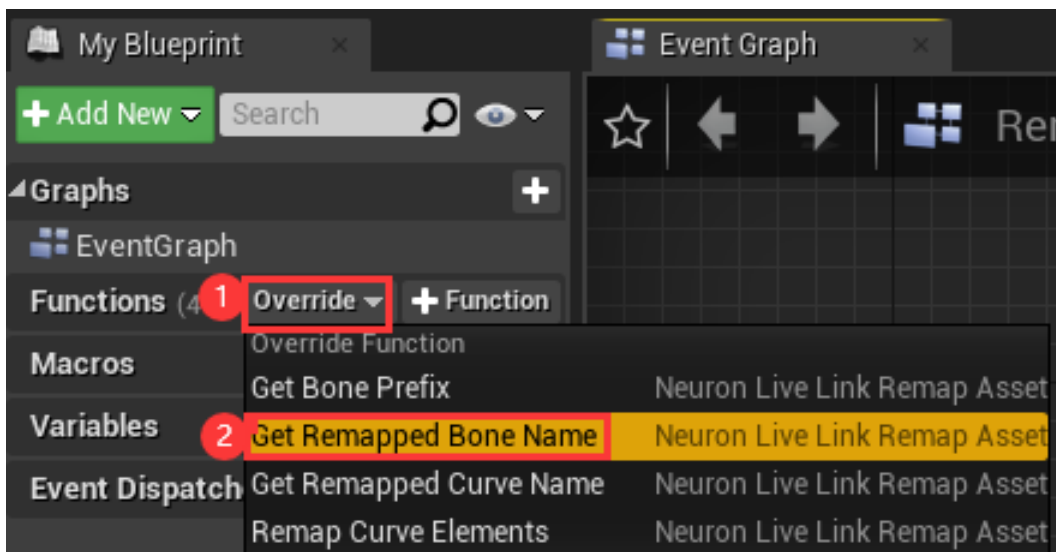


3. Search NeuronLiveLinkRemapAsset and Click Select button.



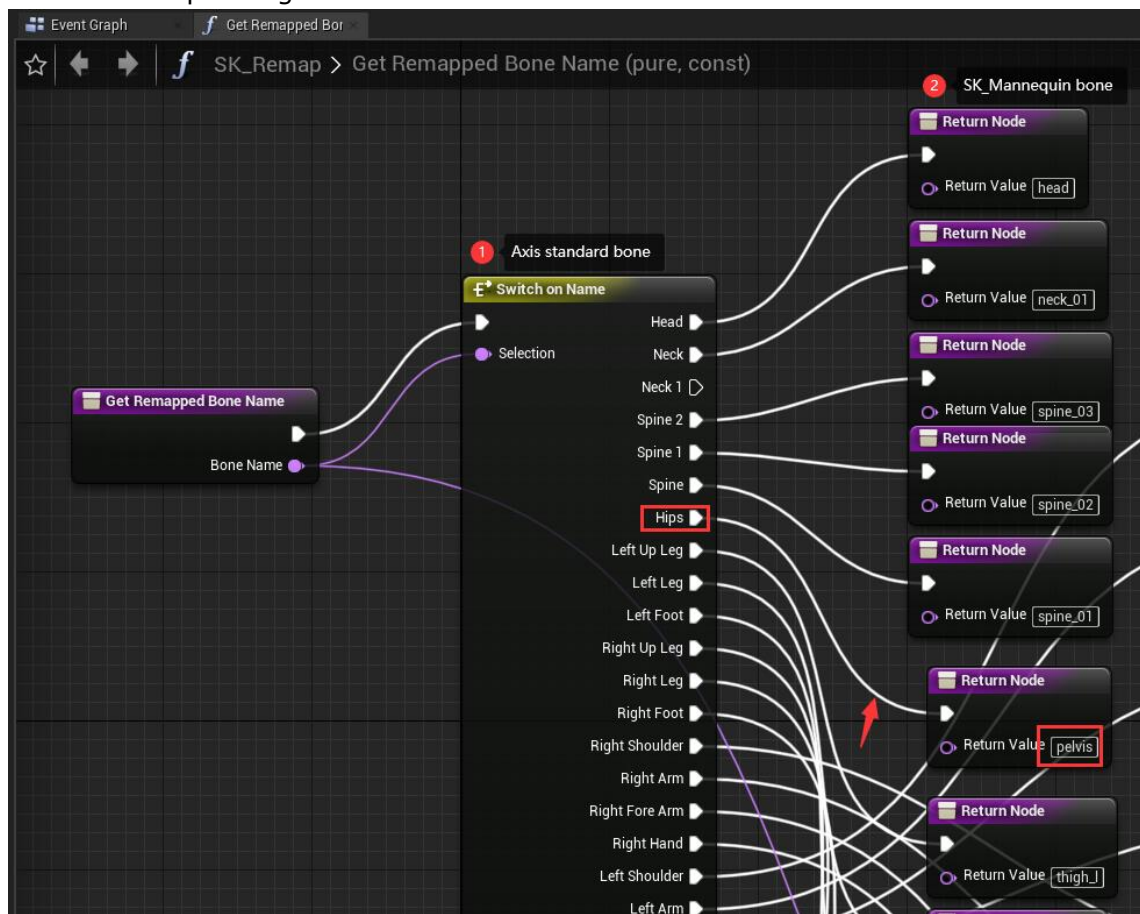
Note: If you want you can rename it in the Content Browser.
Double click to open it.

4. Move Mouse over + button (Function), click Override dropdown button to select Get remapped Bone Name in My Blueprint panel.



5. Delete **Parent: Get Remapped Bone Name** node and create **Switch on Name**.
6. Add all the bones name of Axis and **SK_Mannequin**, manually assign the

corresponding Bone.



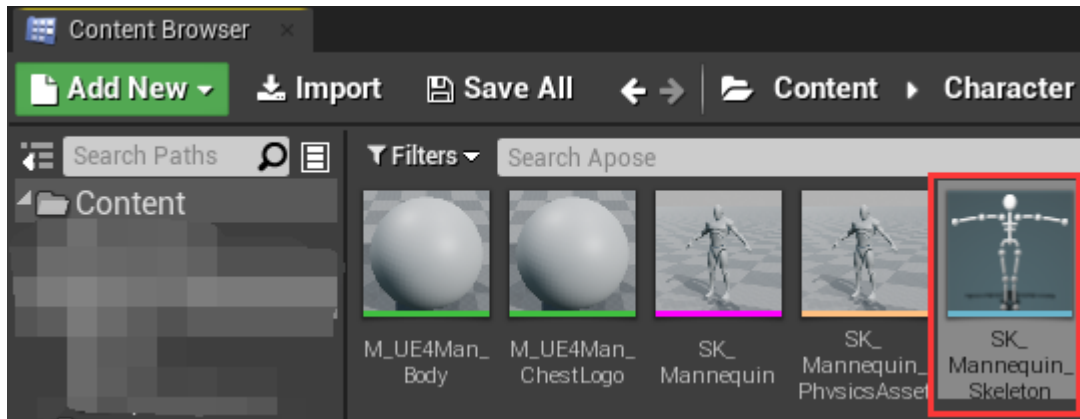
7. Click Compile and Save button.

11. Manage Retarget Base Pose

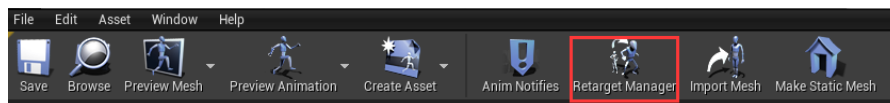
There may be instances where you want to retarget animations to a Skeleton that is not quite using the same base pose as your Source Skeleton.

For example, the base pose of **SK_Mannequin_Skeleton** is A -pose but you want to use animation from Axis Studio which using T -pose as reference/base pose. we may encounter animation issues. In this section we go through how to solve this problem.

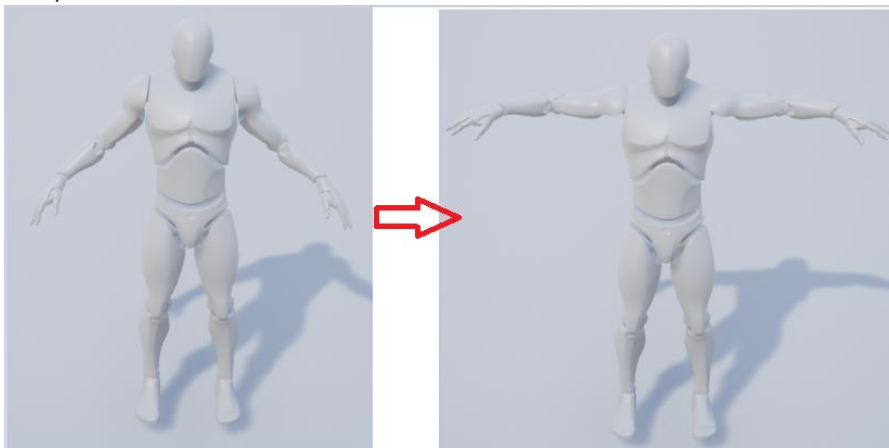
3. Inside the Content Browser, double-click **SK_Mannequin_Skeleton**.



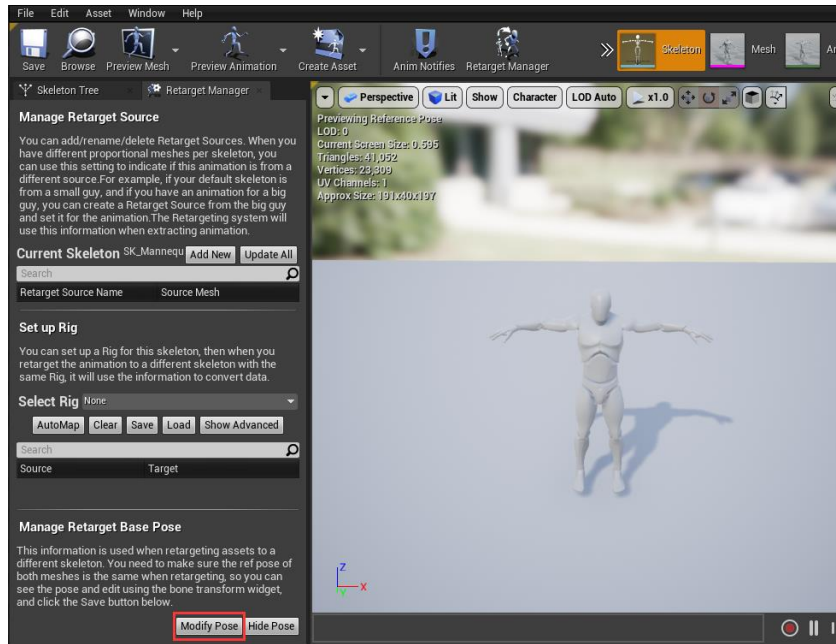
4. Inside the Skeleton Editor, from the Toolbar click the **Retarget Source Manager** button.



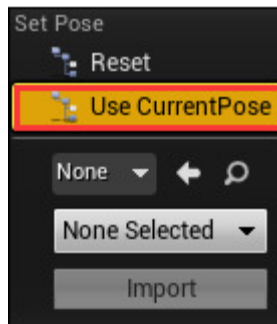
5. Edit base pose from A-pose to T-pose (select bones in our character and rotate them).



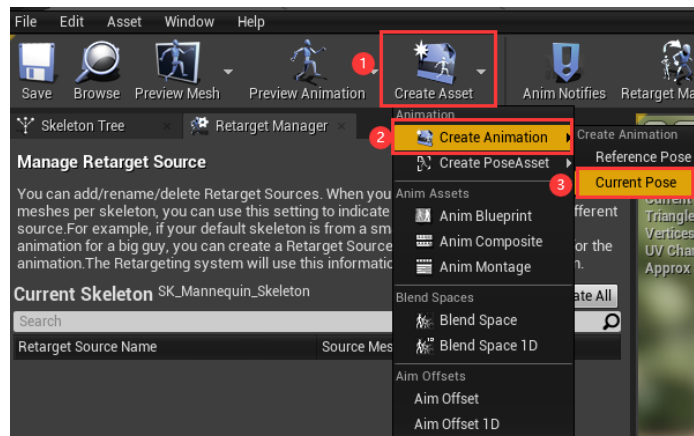
6. Click **Modify Pose** button.



7. In context menu, select **Use Current Pose**.

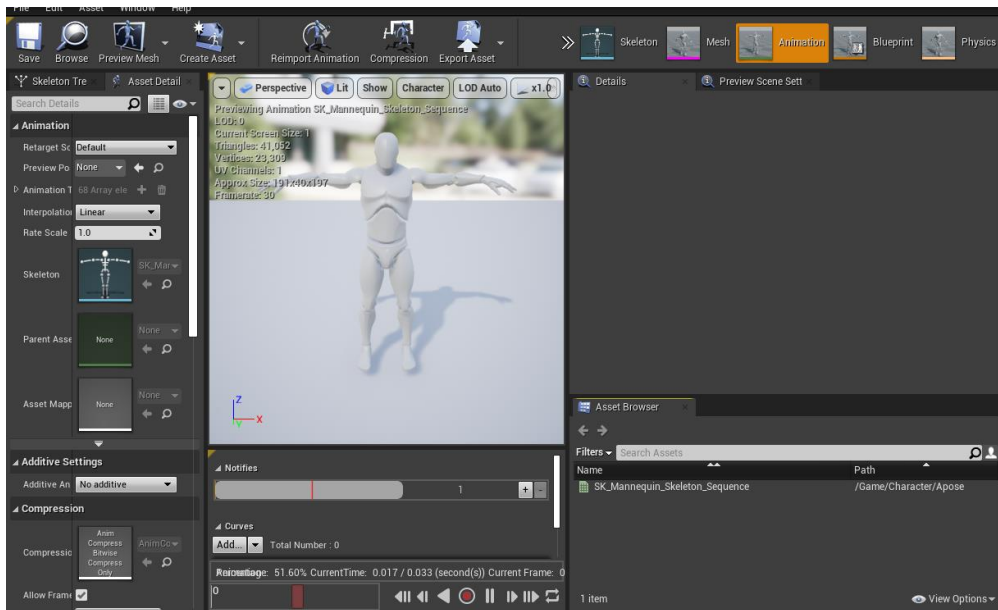


8. Inside the **Skeleton Editor**, from the **Toolbar** click the **Create Asset** and select **Create Animation** at current pose.

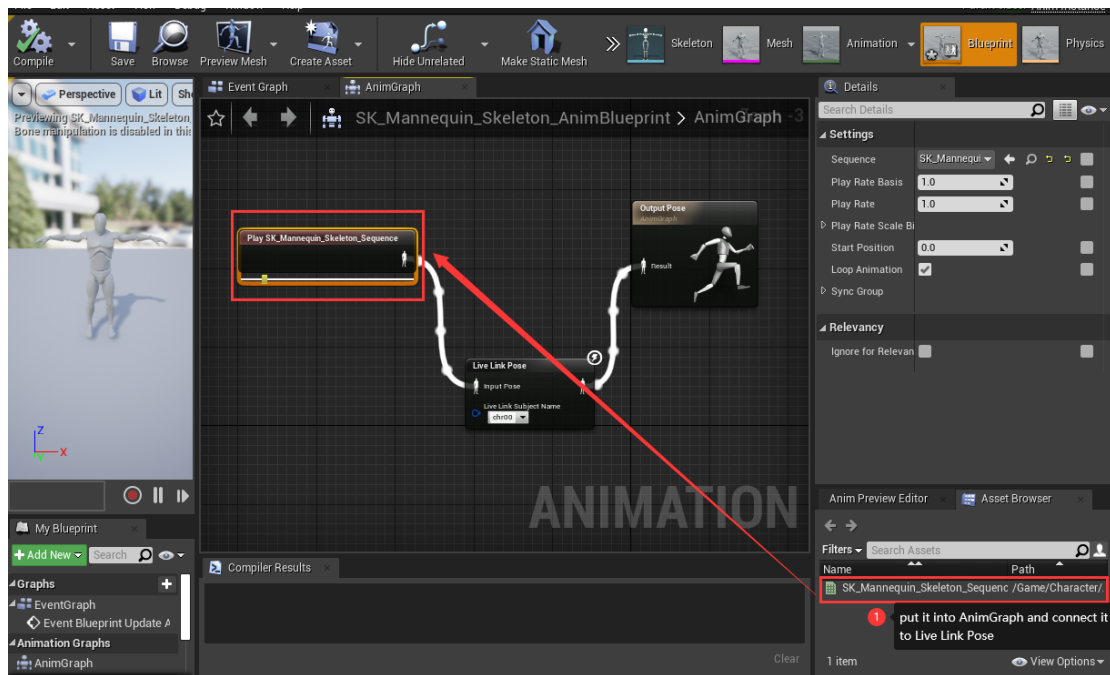


9. Select path and Click OK button.

You will see **SK_Mannequin_Skeleton_Sequence** asset is created in Asset Browser and automatically be open.



10. Add the SK_Mannequin_Skeleton_Sequence under Asset Browser into Animgraph of your Animation Blueprint and connect it to Live Link Pose node.



11. Click Compile and Save.

12.Examples

11.1 Working with Maximo character

1. Open your UE4 Project and Install **NeuronLiveLink** Plugin
2. Run Axis Studio and play a file or connect device
3. Select **Perception Neuron Studio Skeleton** in BVH Broadcasting
4. Import Maximo character into your UE4 project
5. Add **Axis Neuron Live** source in in the Live Link Streaming Manager
6. Create Animation Blueprint based on Maximo Skeletal Mesh asset
7. Open Animation Blueprint
8. Add **Live Link Pose** node and connect to **Output Pose** node
9. Select **MaximoLiveLinkRemapAsset** as Retarget Asset.
10. Select Live Link Subject Name
11. Click Compile and Save