Technical Report

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Contents

Introduction:

This report shall demonstrate a key insight regarding the range of actions and genius, supporting the use of an Auditory framework located within the given game level. Constructed with Unreal Engine 4 (Epic Games), the level known as "Smuggler's Bay" is a third person (with a First-Person addition) action-adventure game that is revolved around looting. A female protagonist thief must overcome various obstacles and collect as much treasure within a specified time limit (10 minutes) whilst avoiding guardian like foes that will fire lethal projectile balls of fire. Along the way lies a variation of items such as lockpicks and potions to assist in the plundering map. Due to the multiple grounds the level covers, this leaves open slots for significant and interconnecting components that will be projected on a life-like scale.

Background analysis:

Before getting to the consideration of the audial components, that form the most expressive surround sound. The level itself has many different environments around it. This ranges from the most compacted wooden medieval house, to the spread open bridge landscape. This must consist of a clean transition when it comes to the change of multiple environment materials as it ensures a soft flow in terms of the type of surface. Most engines used in this age of gaming like Unreal and Unity are mainly focused and adapted towards physical aspects of audial generating. Lack of understanding its significance will lead to a lot of unrealism within a game world.
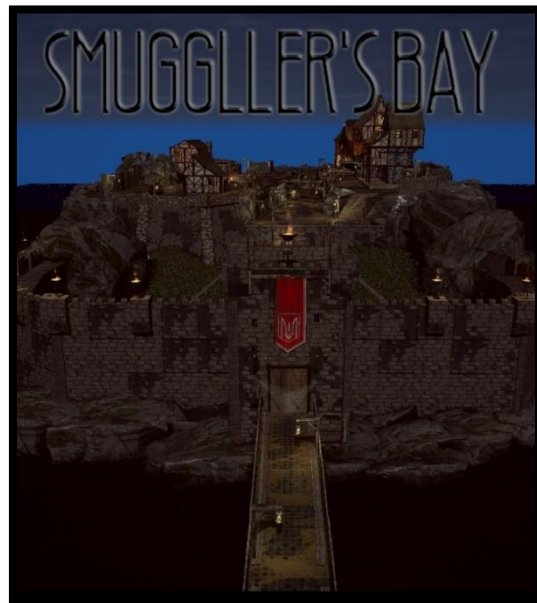
Atmospheric Realism:

Regarding the wide world of a game level, there are all components including the background noises of the world, as well as the interactive sounds made on screen by a player. The realistic atmosphere is a primary key to achieve realism to its full potential. (Clayton, 2014). The immersive environment can be made up of constant recurring sounds like dogs barking in the distance, to insects clicking through the tall grass. Taking away these types of Atmos would be white noise to players and unnatural. Moral of the purpose in sound is to give an output response to players to feel a sense of engagement and to experience a thorough involvement in the story or theme of a game. The same process works with interface mixing sounds as this helps in the audial picture even before revealing a game world.

Attenuation:

The defining of Attenuation is found through the "Weakening" of a sound modification that is linked to a character's "Closeness". Engines, Especially Unreal 4 have a strong feed through the physical aspects of real-world scope.
The sounds itself half its force to duplicate the travel distance it can be performed at(Rouse, 2019). The unique functions in unreal allow the changes to be manipulated further or less depending on sound type and purpose.

Occlusion/Obstruction:

Following along the same group of the sound mixers is Occlusion. This takes place when an audial source, and the listener or that source is split apart form one another. An appropriate example would be a near a car or perhaps a lift.
The other mixer, Obstruction is when sound gets degenerated by an object. This links in with volume attenuation or frequency ratings. Their dependencies rely heavily on scale, material class, width and where the obstruction is stored that links to the sound source itself.

## Implementation Approach:
Scene breakdown:

Scene 1: Bridge to Village
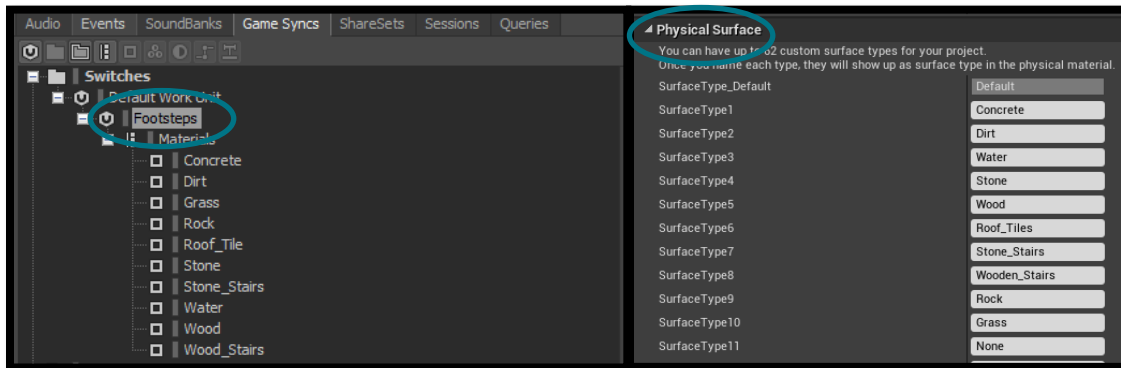## Scene Description:

This first scene is the beginning of the characters purpose and to what lies ahead through the input of dialogue to match displayed text. With an instant ambience to grip the feel of the map. As the player is moved through different environmental surfaces, they are changing to display a realistic feel when taking every step on multiple types of physical materials.

Implemented Sounds:

Use of AK Sound events linked from the middleware WWise Integration with Unreal Engine 4 in Blueprint of the characters movement. This was made by connecting to the text input nodes and displaying during the same time frame and location of Actor. This is a onetime run due to an introductory setting, but duration is matched with playability enabling.
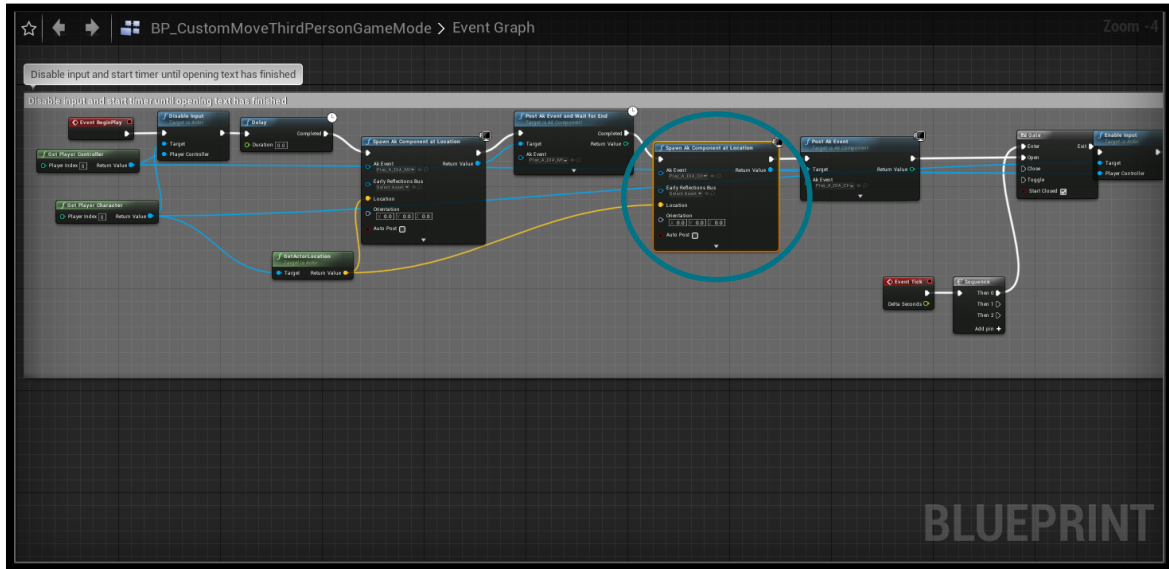

Use of a Switch container constructed in WWise and generated in assigned Sound bank to provide multiple surfaces to be accessed and Sound output correct footsteps. Use of animation to notify correct character footing enabled footstep accuracy to a realistic level.
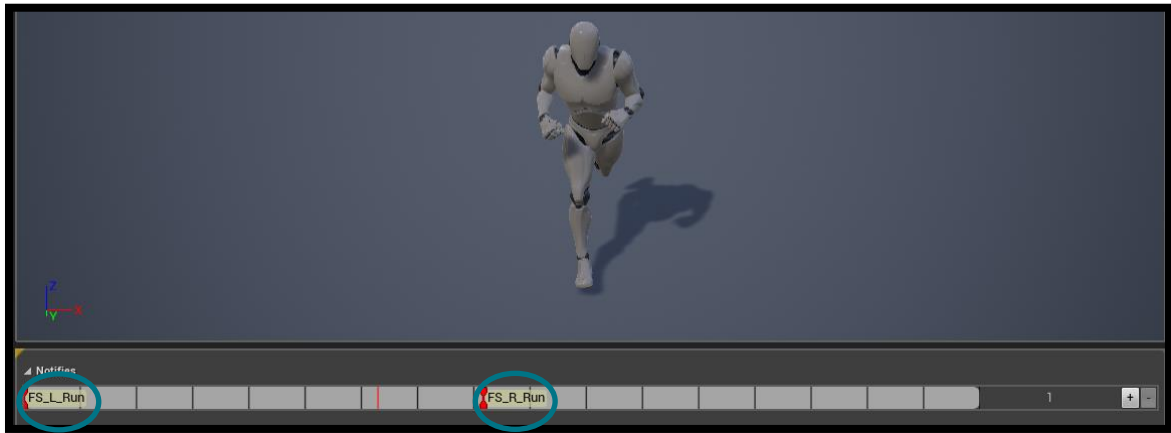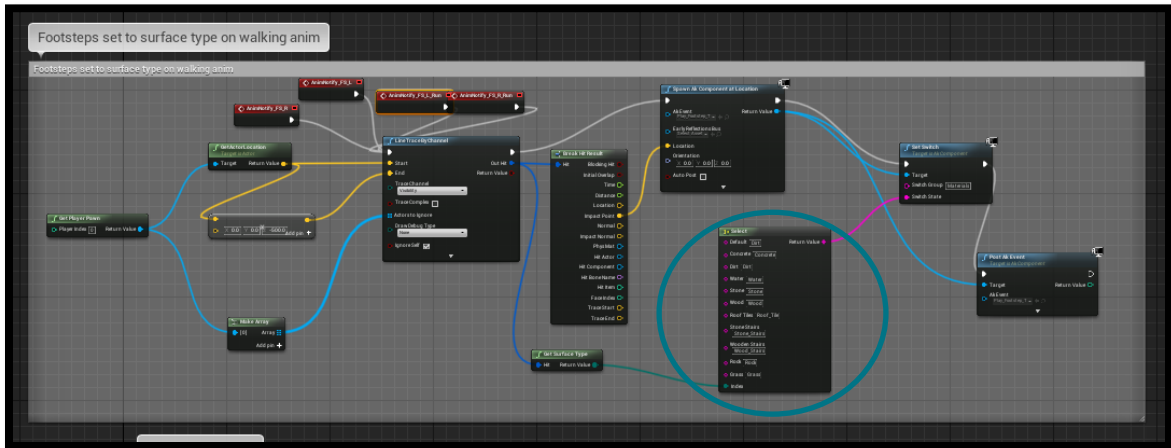
Input of Empty blueprint actor classes to establish Atmos sounds in game. This generated with use of Attenuation in WWise, as well as in-game objects in level.
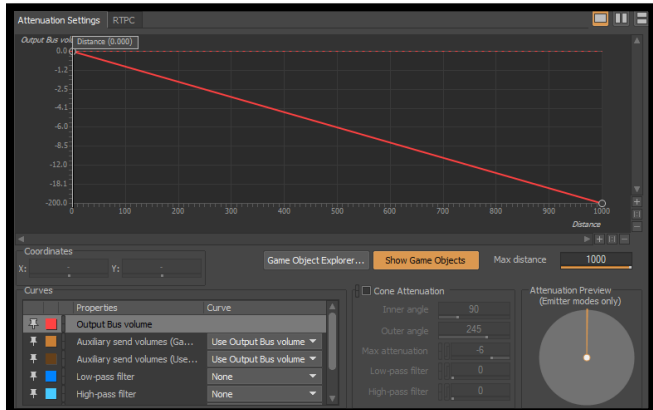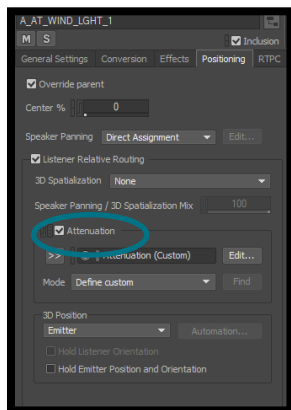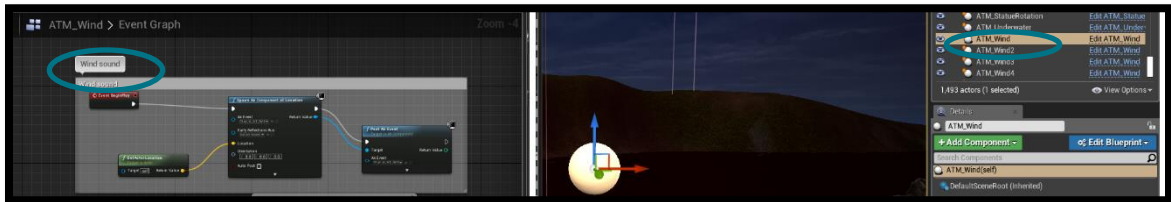
## Scene 2: Village Courtyard
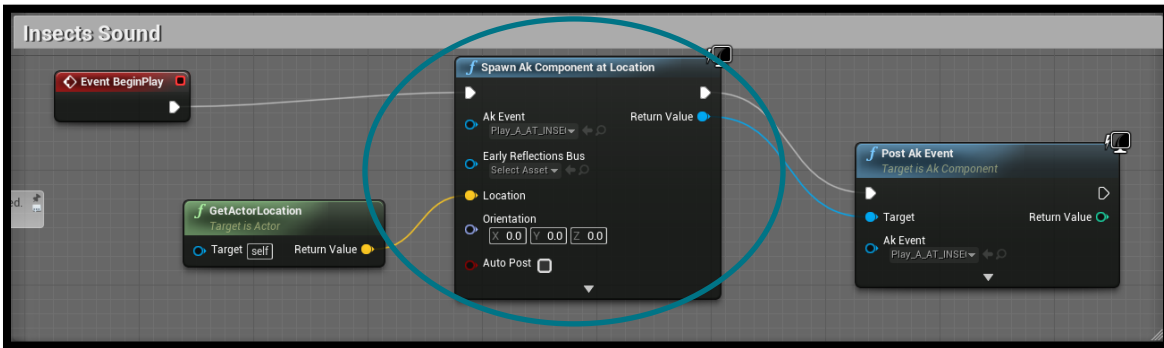

Scene Description:

Entering the walls to a grassy patched area towards the Stoney stairs that lead to the village center surrounded by the guardian statues in return have projectiles ready to fire if caught by their gazing beam of light. Tension in environment rises from the statue's wrath but open spaced areas to explore for treasure.

Implemented Sounds:

Use of AK events at statues with projectile and detection events connect via post event nodes when player in statue beam and when projectile is fired. Items involving potions output a pickup sound as player moves close if room for restoring health.
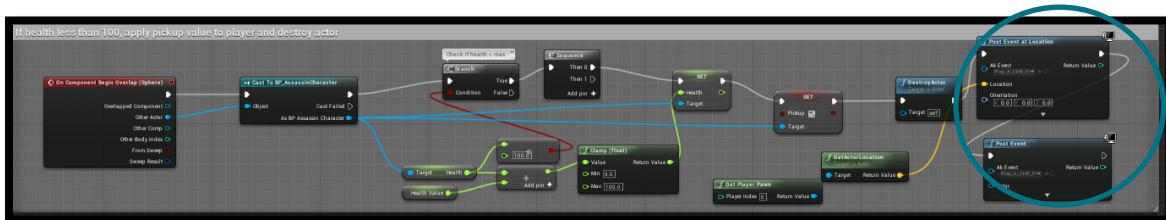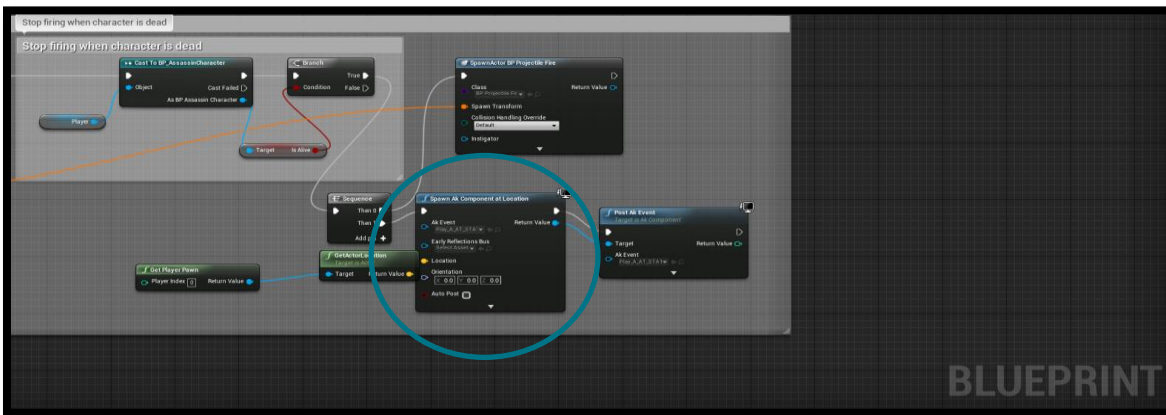
Further Atmos input added due to increase of environment change from windy bridge to Insects clicking in tall grass. Cast to blueprint actor and called node to output ambience. Additional character sounds to carry out player pain when falling from great heights on character location.
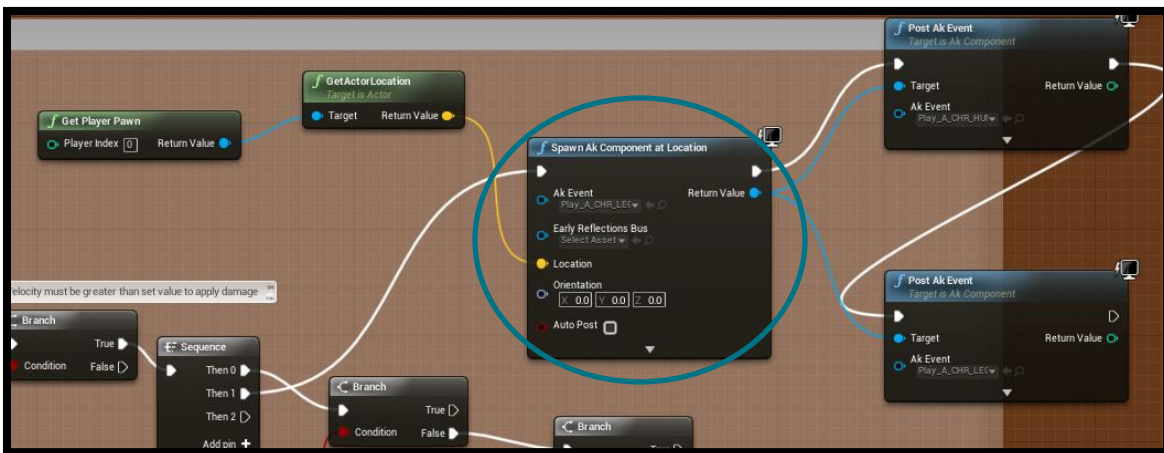
## Scene 3: The Village Grounds/Streets

Scene Description:

Center of village has multiple pathways to navigate and more guardians. The narrowness provides potential input for effective atoms in such tight building structures.

Implemented Sounds:

Referring to atoms, lit open Bonfire has been manipulated to crisp and loop on event play as animation triggers repeatedly for that singing realistic feel. Walking to doors in first person already displayed text. But triggers a locked door event before it has been attempted. Down the narrow walkways triggers dogs barking from a far.
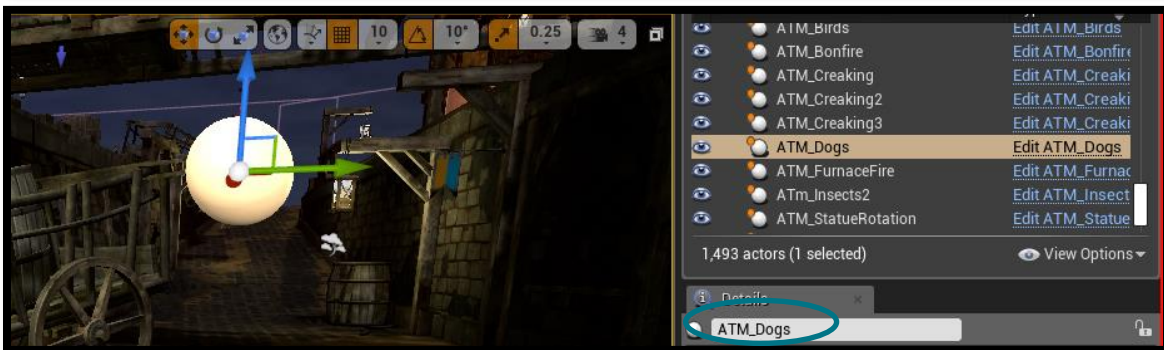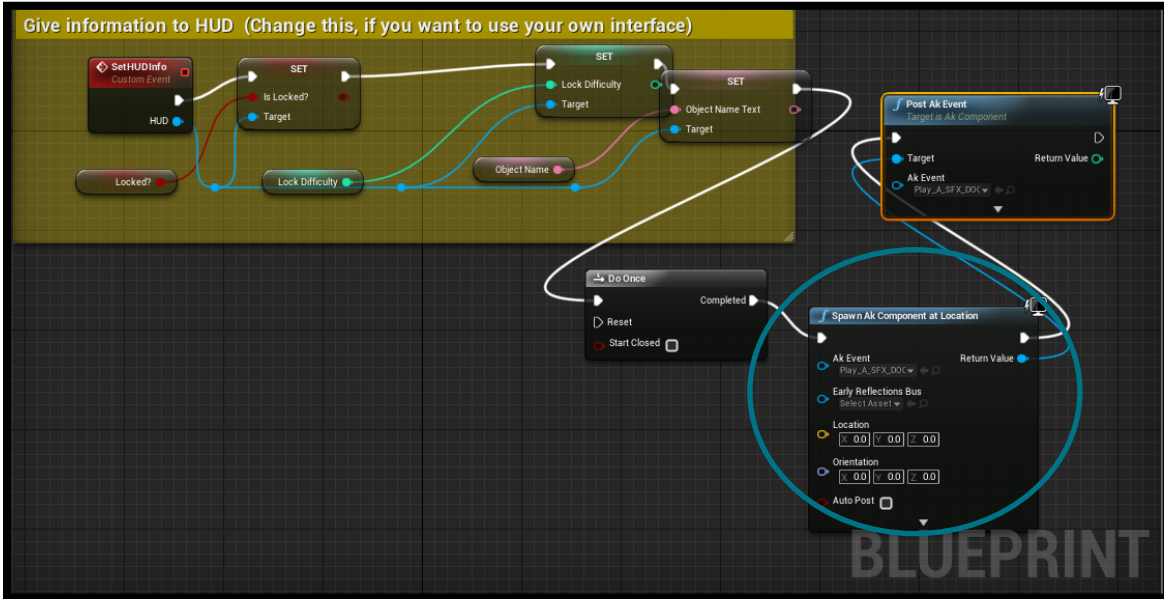
Scene 4: Inside Buildings

Scene Description:

One of the more interior areas of the map. The crooked houses are against the Atmos wind from outside compared to a furnace burning inside. Here sound travels differently with a more compressed ambience until opening the door to let both sounds collide under the same roof.

Implemented Sounds:

Lockpicks attached to doors have been inputted with a variation of sounds due to the mechanism requiring so much character physical interaction. Doors and chests open/close nodes with use of Ak events and play in correct form. The Atmos of the house involves a wooden creak through the walls and ceiling, or a window tap that takes from outside. Furnace fires output sound while it sizzles in the cozy wooden buildings.
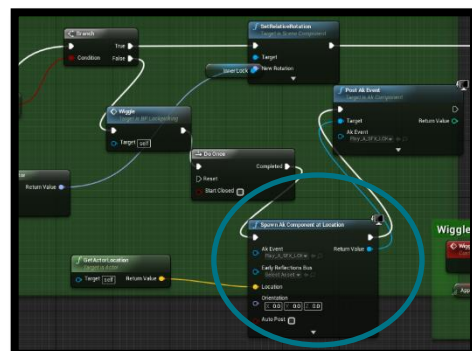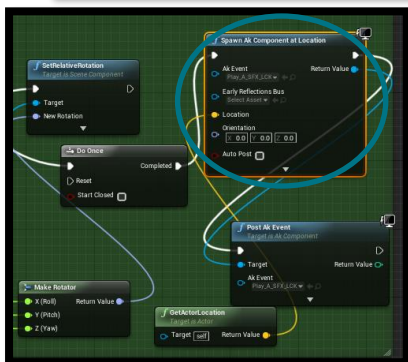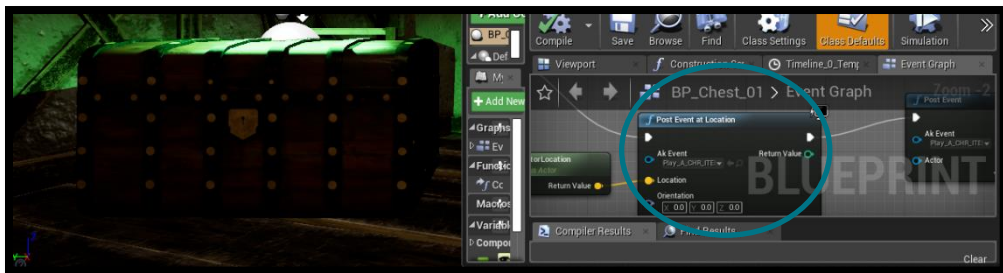
Audial Optimizing and Organizing:

The chosen methods for optimizing and Organizing ensured that file organizing, and labelling would be readable for ease of use during development. The organizing in both WWise and Unreal positions specific files and folders has allowed efficient workflow throughout the implementation of the game level. The optimizing techniques have demonstrated and compared how the sample rate, channel and file type has converted the original audio sources to a reasonable size within the 10MB limit of a sound bank.

Generated Sound banks in Unreal Engine from WWise integration.

Conclusion:

To Finalize, the demonstration of this technical report has displayed the use of audial implementation of sound effects into a game level and has met to the realistic requirements and standards at best. The overall sources used within this level was contained within the given 10 MB limit leaving enough size maintainability. Any minor implementations that could potentially be misinterpreted or incorrect were down to specific functions and mechanics confusion. There has been a lot of experience and knowledge gained from this sound experiment and it does portray a quality and primary skill to have within the industry, especially gaming.

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