Universal cross-platform Pro Voice Chat

With this plugin, you can integrate easily in Blueprint or C++ :

- **Team voice chat like in Counter Strike**
- **Proximity voice chat like in PUBG**
- **Global voice chat in a lobby for example**
- **It is cross platform Windows / Android / iOS**

There is no need to add any component to your character, there is no need to heavily modify your existing project.

Patch Updates:

1.3 : Fix bug PC if no microphone connected

1.2 : Fix windows microphone first speak random sound, adjust opus codec settings

1.1 : Fix listen server

1.0 : Release

Content

I. Description

This plugin is made for **cross-platform multiplayer voice chat**. It supports **Windows, Android, iOS, Linux and Windows dedicated server**. There is several **voice chat mode : Global, team/radio, proximity**.

It is heavily **network optimized** with usage of **Opus encoding**, and server **send network data only to relevant clie**nts (for example, only clients in the same team for team voice chat).

It is intended to be used with **Blueprint but is also 100% compatible with C++**.

It can be used on Internet or LAN on dedicated or listen server.

1. Features

- **Cross-platform** Windows, Android, iOS voice chat
- **Different types of voice chat** : Global, team/radio, proximity
- **Network optimized** : server use compressed data with opus codec, server send data to only relevant clients given settings of voice chat (Global, team/radio, proximity)
- **Mute a player**
- **3D Sound or 2D Sound**, you can use your own attenuation settings
- **Supports choose of microphone sample rate** and channels number to let you choose quality and network usage.
- **Set your microphone volume**
- **Get raw PCM data of microphone input** on Windows, Android, iOS (useful if you want to make your own voice chat)
- **Compatible with any UE4 Online Subsystem** as long as they uses UE4 standard network API (RPC, replicated variables).
- **Tested on hardware** : Dedicated server Linux, Dedicated server Windows, Client Windows, Client Android 8 / 9 / 10, Client iPhone iOS 12.0 / 13.0 / 14.0

2. Contact

For any help related to this plugin, please send an email at contact@meoplay.com

Or join discord server : DISCORD

II. Setting up your project

1. Project Config file

If you use this plugin for a Windows or both Windows/Mobile game then you need to activate microphone input. If you use this plugin for a mobile game only, you can skip this part.

1) Go to your UE4 project folder, open Config/DefaultEngine.ini
2) Add the following lines :
   [Voice]
   bEnabled=true
3) Save

2. Install plugin

1) Open your UE4 project
2) Enable plugin “Universal cross-platform voice chat”
3) Restart

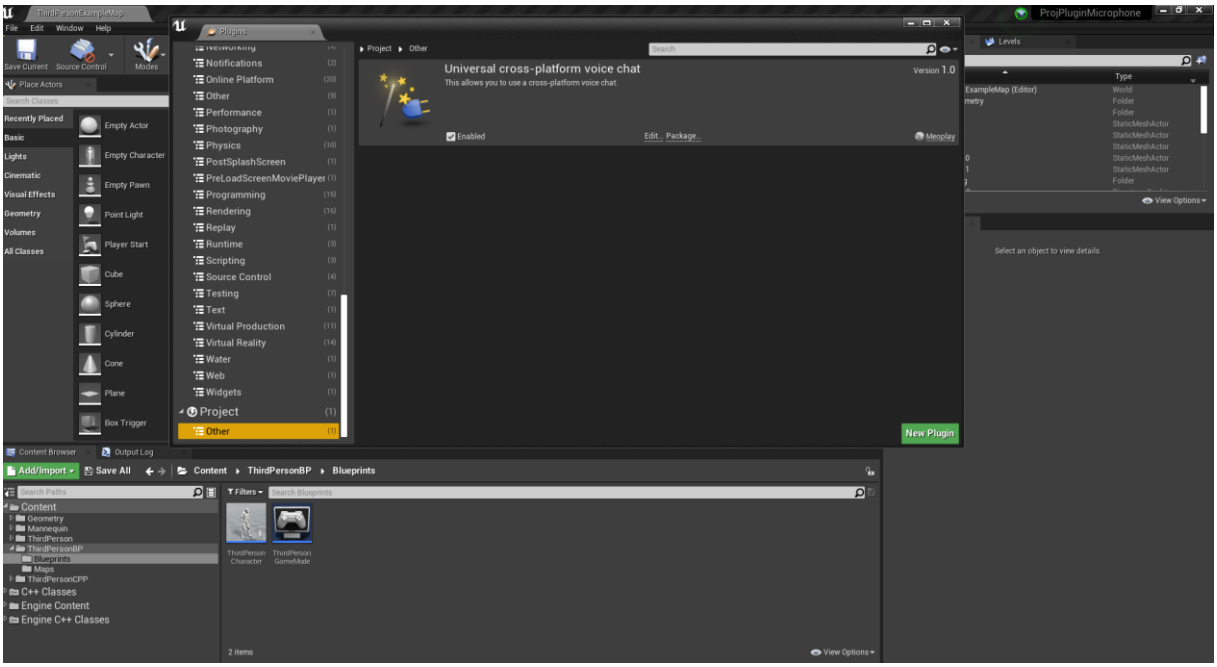


Figure 1 Enable plugin

III. Using voice chat in Blueprint

1. How the plugin works

Server spawns an actor called "PlayerVoiceChatActor", it is replicated to the client, then the client can start using it (start speaking, stop speaking, mute, …)

There is one class called "PlayerVoiceChatActor" that controls one player voice chat. There is one component called "MicrophoneSpeakComponent" that handles microphone input and audio output.

You are only required to use "PlayerVoiceChatActor", you need to **spawn one "PlayerVoiceChatActor" on server for each player** that connects to the game.

"PlayerVoiceChatActor" is then **replicated from server to client.** Each client easily retrieve his own "PlayerVoiceChatActor" with a static variable comparing owner with local player controller.

"PlayerVoiceChatActor" is **automatically destroyed** by server when player leaves the game (binded event to "player controller destroyed")

On Mobile Android and iOS, you should ask permission before starting voice chat.

2. Creating voice chat actor “PlayerVoiceChatActor” on server

“PlayerVoiceChatActor” needs to **be spawn on server and needs to be owned by a player controller.**

It is recommended to **spawn “PlayerVoiceChatActor” in GameMode when OnPostLogin** is called.

You can do this like this:

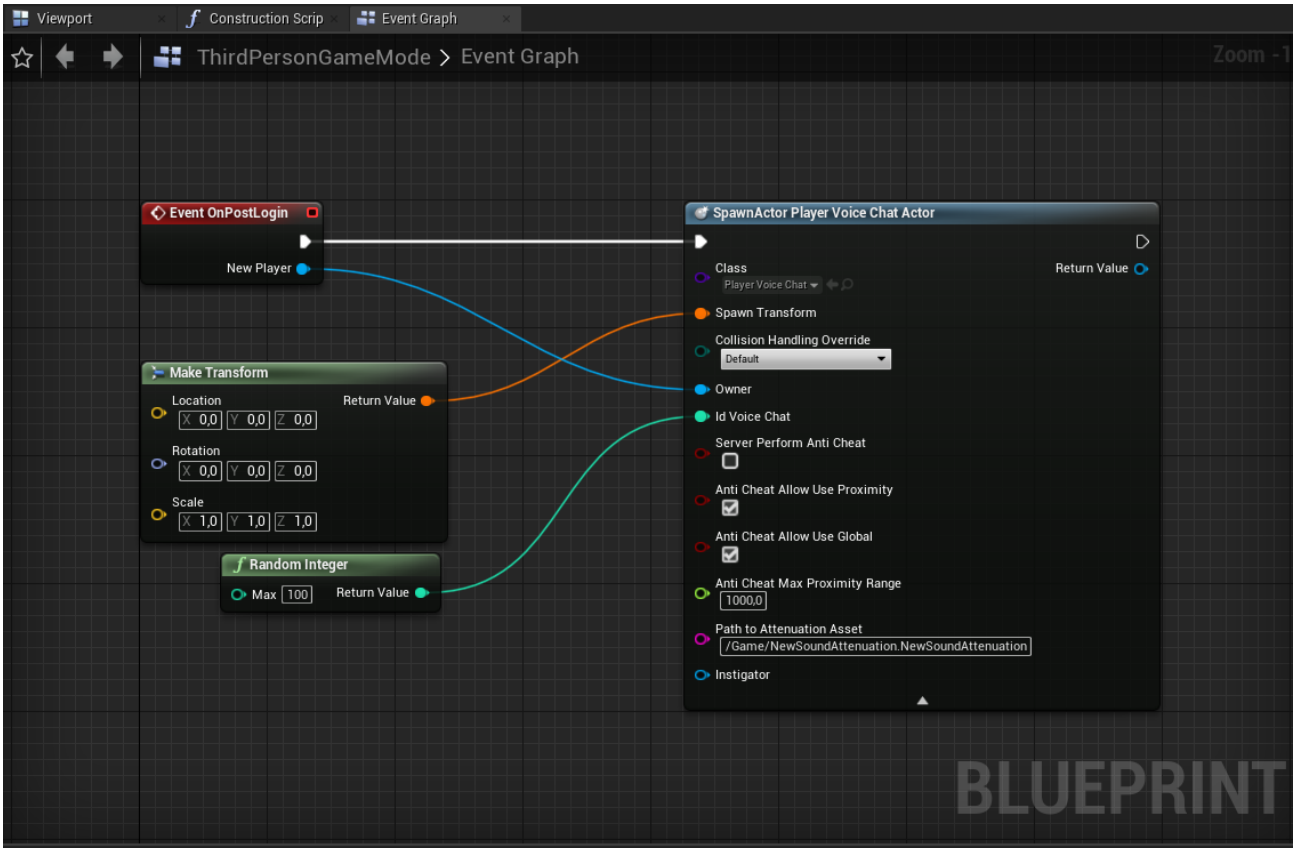


Figure 2 Spawning on server "PlayerVoiceChatActor"

The parameters are :

- **Owner** : owner need to be from class or subclass of “Player Controller”
- **IdVoiceChat** : Used for debug
- **Server Perform Anti Cheat** : When you activate this, server will ensure when receiving a client request to speak that the client is authorized to use proximity, global chat, team chat …
- **Anti Cheat Allow Use Proximity** : Only used when Server Anti Cheat is activated, it allows this player to use global chat, can be set to another value at any time.
- **Anti Cheat Allow Use Proximity** : Only used when Server Anti Cheat is activated, it allows this player to use proximity chat, can be set to another value at any time.
- **Anti Cheat Max Proximity Range** : Only used when Server Anti Cheat is activated, set the proximity range, can be set to another value at any time.
- **PathToAttenuationAsset**: Put this empty if you don’t want to use 3D sound.

Otherwise, this is the SoundAttenuation asset that will be used to use 3D Sound if you want to. You need to put the path to your asset like this "/Game/NewSoundAttenuation.NewSoundAttenuation" for a SoundAttenuation called NewSoundAttenuatuin located in Content folder.

Note relating attenuation asset in packaged game : In cooked builds your assets won't get cooked if you load them from code. They need to be referenced through some properties or in a level.

3. Using voice chat actor "PlayerVoiceChatActor" on client

The functions used in next steps are global functions, you don't need to have a reference to actor or component, just search for function in category "Voice chat universal" in Blueprint.

1) Initializing Audio Settings (Optional)

You can manually set the sample rate and number of channel used by the microphone. If you don't set it, it will be automatically set when you start speaking (default : 48000Hz and 1 channel).

Supported sample rate are 8000, 16000, 24000, 48000Hz. Number of channels supported are 1, 2.

Using a sample rate of 48000 Hz consume twice as much network data to 24000Hz.

Using 2 channel instead of 1 consume twice as much network data

For a good audio quality, use 48000Hz and 1 channel. 24000Hz, 1 channel is acceptable too.

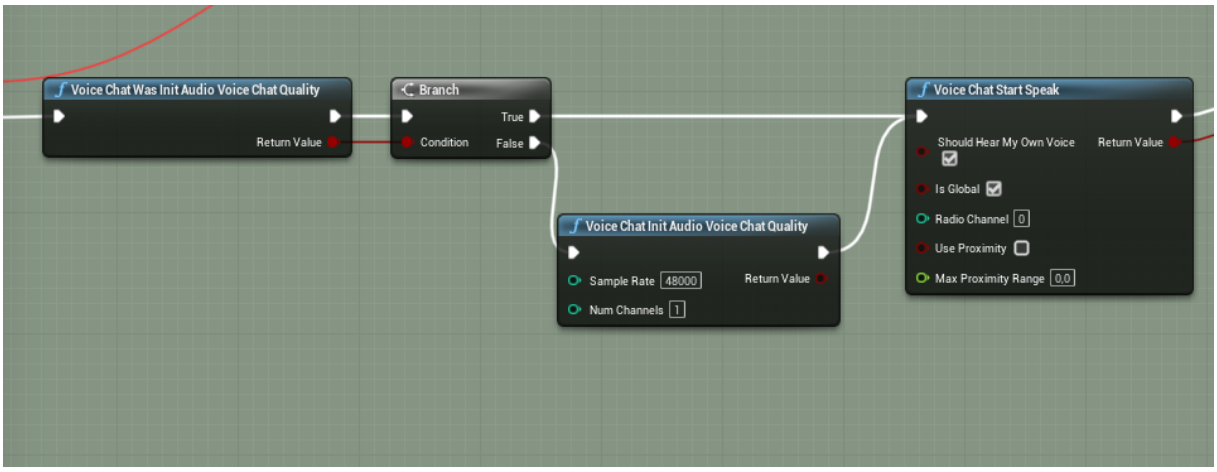


Figure 3 Manually initializing before speaking

2) Speak voice chat

To start speak on voice chat, use node “Voice Chat Start Speak”.

To stop speak on voice chat, use node “Voice Chat stop Speak”.

If you want to hear your own voice when speaking, set “ShouldHearMyOwnVoice” to true in “Voice Chat Start Speak”.

For making sure your microphone and the plugin works, you should make sure to enable voice playback with parameter “ShouldHearMyOwnVoice” when using node “Voice Chat Start Speak”

a) Speaking global voice chat, no proximity (Example : Lobby)

For example use the following in your character blueprint (or anywhere else it doesn’t matter), use the blueprint node “Voice Chat Start Speak” with following settings :

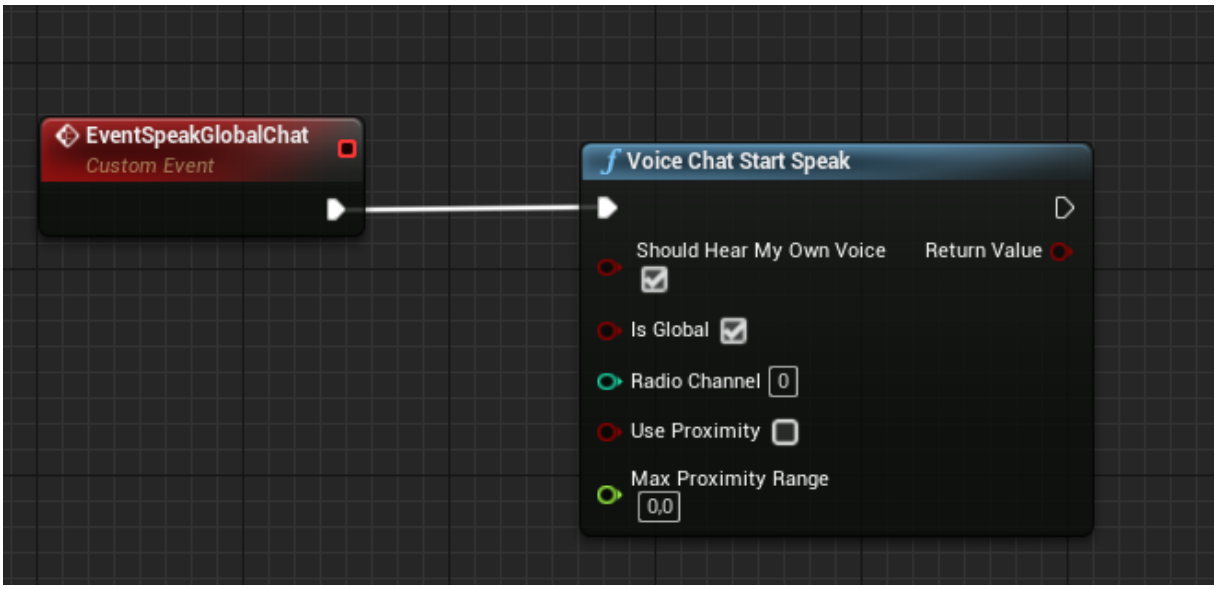


Figure 4 Speak to eveyone wherever their character are in the map

b) Speaking team voice chat, no proximity (Example : Counter Strike)

Use the blueprint node “Voice Chat Start Speak” with following settings, **usually you would put one radio channel per team** :

IsGlobal : false
Radio channel : Put your team channel, here it’s 1
Use proximity : false
Max Proximity Range : players within this distance will be sent voice chat, you can 1000 for example

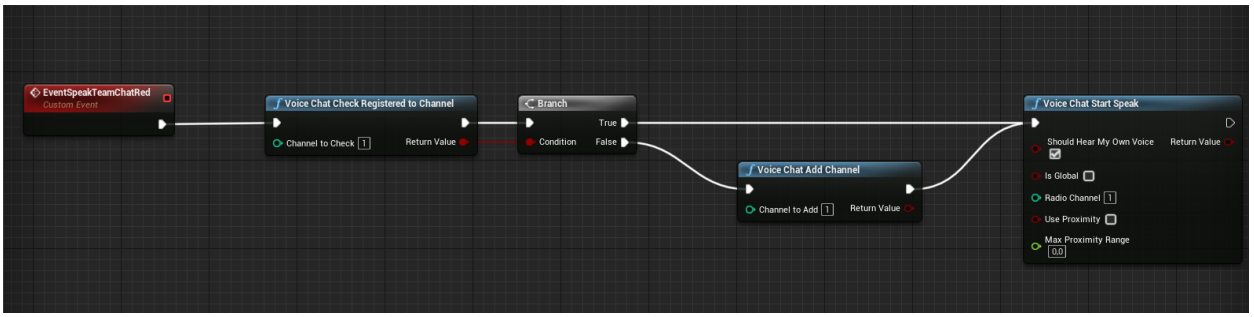


Figure 5 Speaking to players that are registered in channel 1, wherever their character are in the map

Example of Counter Strike like voice chat with red team (Channel 1) and green team (Channel 2):

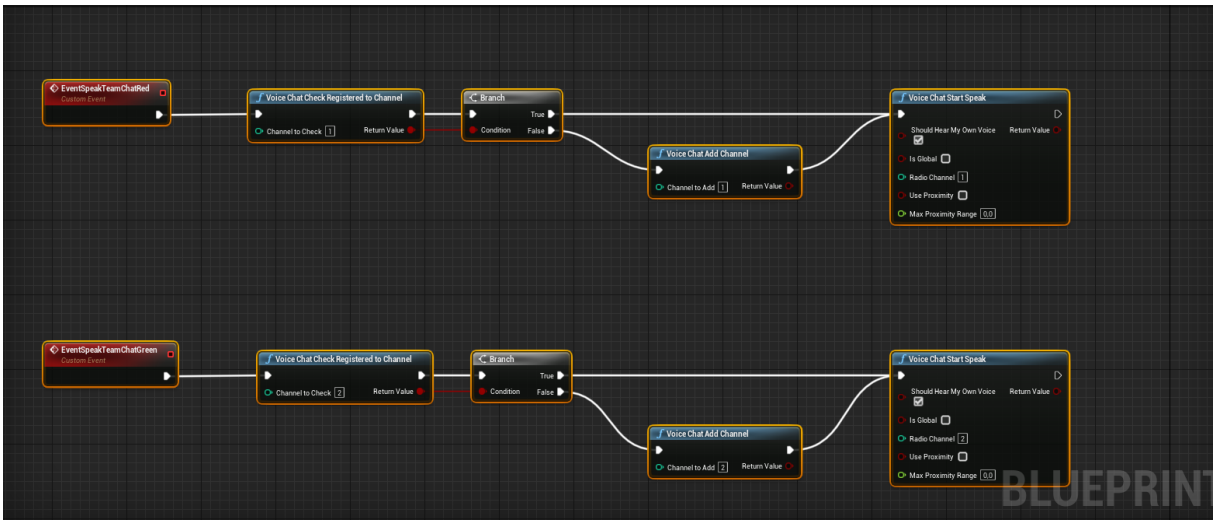
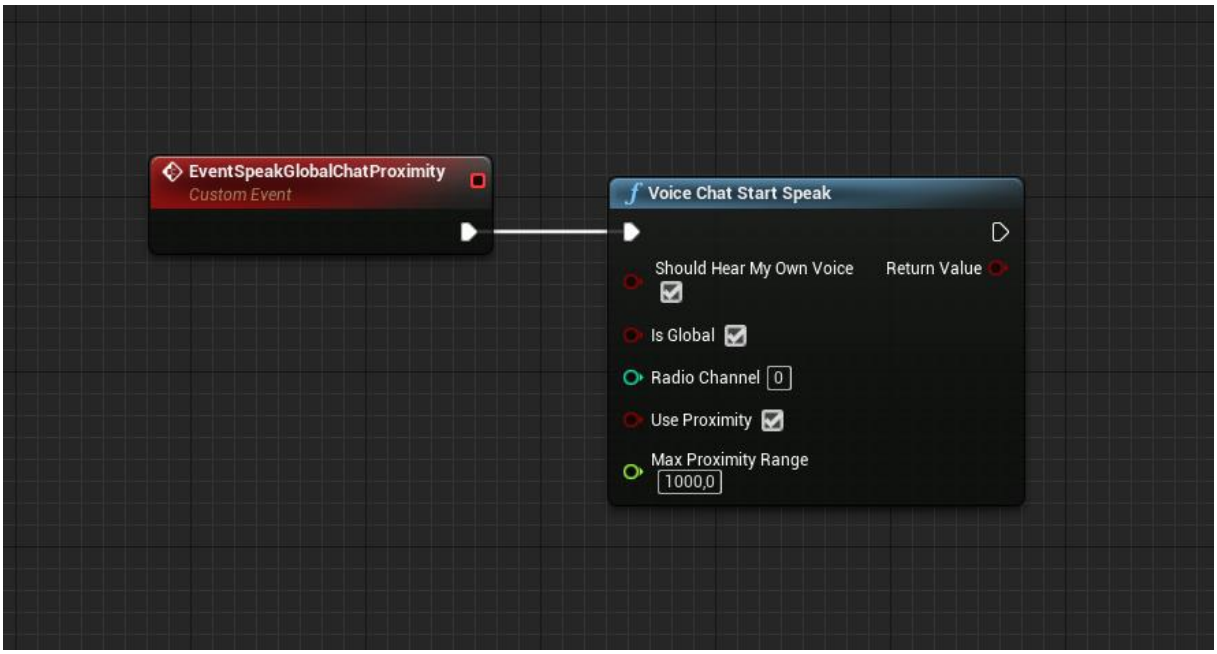


Figure 6 Example of two team voice chat

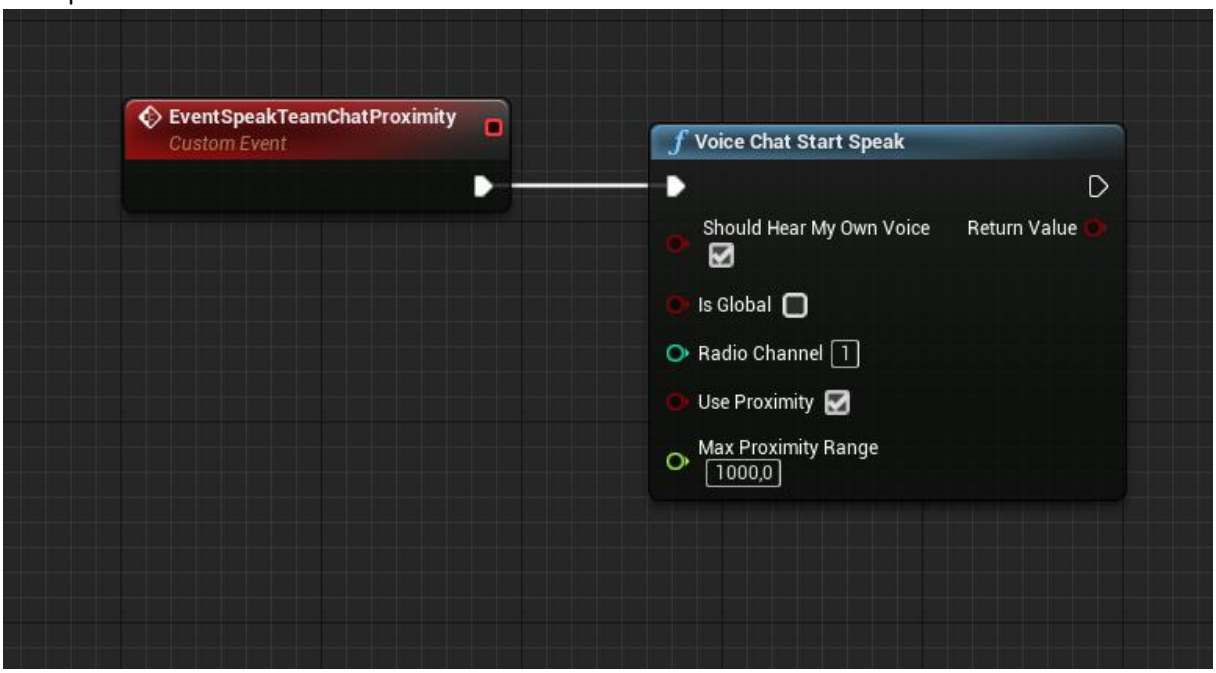
c) Speaking global voice chat within inside proximity (Example : PUBG)

Use the blueprint node “Voice Chat Start Speak” with following settings :
IsGlobal : true
Radio channel : Not used, you can put 0
Use proximity : true
Max Proximity Range : players within this distance will be sent voice chat, you can 1000 for example

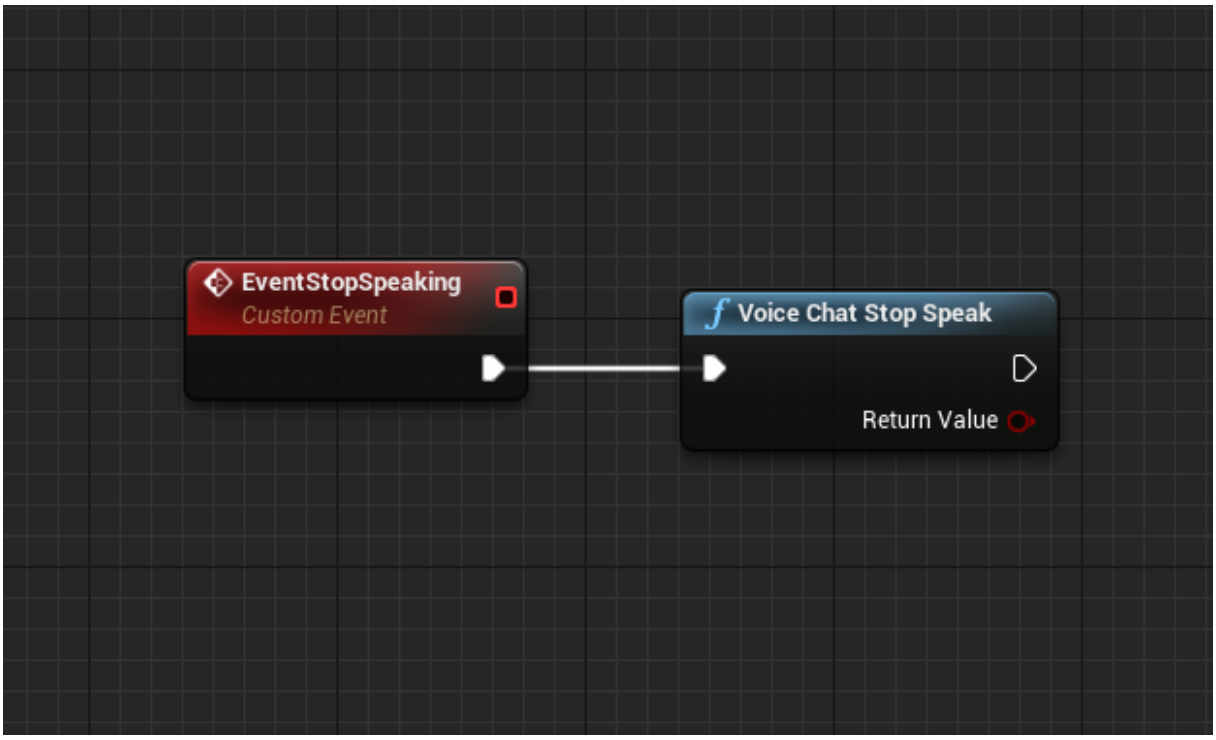


d) Speaking team voice chat within inside proximity (Example : PUBG)

Use the blueprint node “Voice Chat Start Speak” with following settings :
IsGlobal : false
Radio channel : Put your team channel, here it is 1
Use proximity : true
Max Proximity Range : players within this distance will be sent voice chat, you can 1000 for example



e) Stop speaking



4. Complete API PlayerVoiceActor

This are the functions from “PlayerVoiceChatActor” you can use client side with this plugin with Blueprint or C++.

This is a list to manipulate ***local player only***, and should be called on ***client program only***.
These are ***global function that you can call anywhere*** which retrieve the right PlayerVoiceChatActor that ***your local client own***.

1) Client

bool VoiceChatInitAudioVoiceChatQuality(int32 _sampleRate = 48000, int32 _numChannels = 1);

- Used to initialize audio encoder / decoder. If you don’t initialize before starting to speak, it will automatically be initialized with default sample rate of 48000 and 1 channel.

bool VoiceChatWasInitAudioVoiceChatQuality();

- Check if the audio was already initialized

bool VoiceChatStartSpeak(bool _shouldHearMyOwnVoice = true, bool isGlobal = true, int radioChannel = 0, bool useRange = false, float maxRange = 0);

- Use this to start speaking

bool VoiceChatStopSpeak();
- Use this to stop speaking

bool UUniversalVoiceChat::VoiceChatSetMicrophoneVolume(float volume);
- **Use this to set your microphone volume.**

void VoiceChatLocalMuteSomeone(const UObject* WorldContextObject, APlayerState *playerToMute, bool shouldMute);
- Use this to mute someone

bool VoiceChatLocalIsMutedSomeone(const UObject* WorldContextObject, APlayerState *playerToCheckMute);
- Use this to check if someone is currently muted

bool VoiceChatAddChannel(int32 channelToAdd);
- Use this to add a team / radio channel

bool VoiceChatRemoveChannel(int32 channelToRemove);
- Use this to remove a team / radio channel

bool VoiceChatHasMicrophonePermission();
- Use this on mobile to check if audio permission was granted

void VoiceChatAskMicrophonePermission();

- Use this on mobile to ask for audio permission

2) Server

This are the functions from "PlayerVoiceChatActor" you can use server side with this plugin with Blueprint or C++. This is meant for server validation, client and server should allow settings (global, team …) or server discard will discard voice chat if settings are not allowed.

void ServerSetAllowUseGlobal(bool _allowUseGlobal);
- Use this to allow a client to use global chat, ***Note : do nothing if anticheat is not enabled***

void ServerAddChannel(int32 channelToAdd);
- Use this to add a team channel on a client, ***Note : do nothing if anticheat is not enabled***

void ServerRemoveChannel(int32 channelToRemove);
- Use this to remove a team channel on a client, ***Note : do nothing if anticheat is not enabled***

void ServerSetAttenuation(bool enableAttenuation, FString _pathToAttenuationAsset);
- Use this to change 3D sound attenuation settings, replicated to every clients.

void ServerSetAllowUseProximity(bool _allowUseRange);

- Use this to enable proximity chat on a client, ***Note : do nothing if anticheat is not enabled***

void ServerSetMaxProximityRange(float _maxProximityRange);

- Use this to set proximity max range on a client, ***Note : do nothing if anticheat is not enabled***

IV. Example Project

The example project use 3D sound with a range of 1600. You can disable this in example game mode blueprint by setting attenuation path asset empty.

You can try a test project connecting to my master server in the link below:

https://drive.google.com/file/d/172X-wUUT7CtysoyiHdB64TBo1w0DkI6k/view?usp=sharing

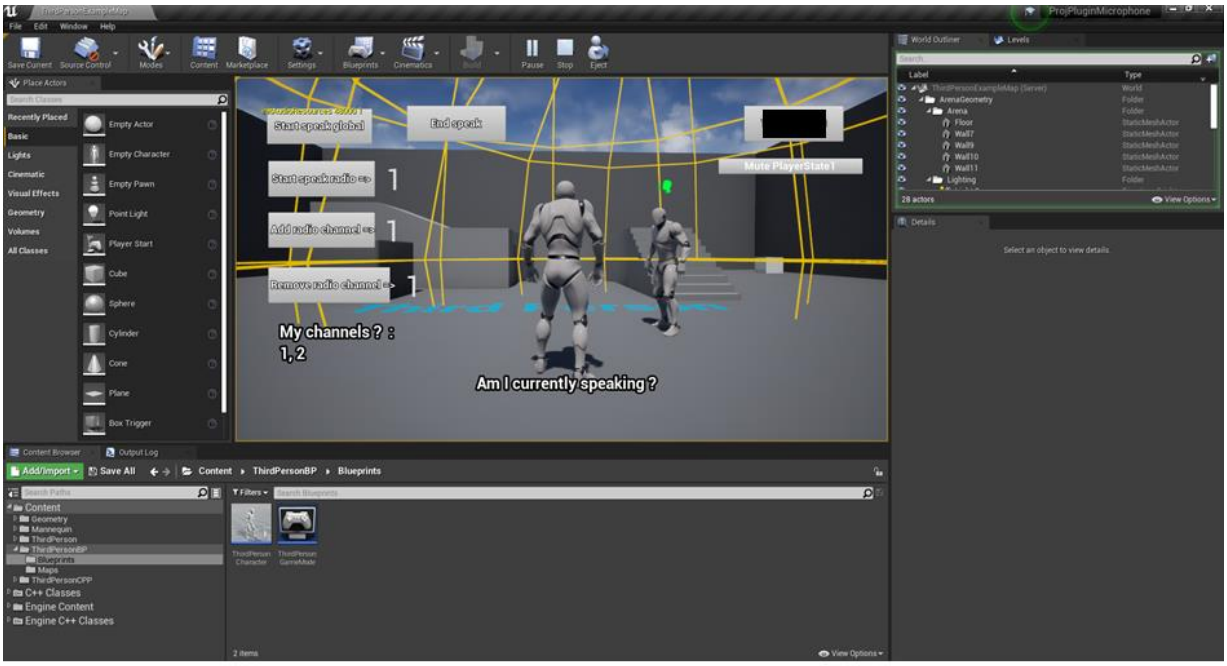


Figure 7 Example Project

V. UE4 Project Network Settings

It is highly recommended to setup your project to fit your network bandwith needs, otherwise you can expect stutter, packet drops.

An example of project settings configuration I use :

File DefaultEngine.Ini :

```
[/Script/Engine.Player]
ConfiguredInternetSpeed=500000
ConfiguredLanSpeed=500000
[/Script/OnlineSubsystemUtils.IpNetDriver]
MaxClientRate=100000
MaxInternetClientRate=100000
```

File DefaultGame.Ini :

```
[/Script/Engine.GameNetworkManager]
TotalNetBandwidth=4000000
MaxDynamicBandwidth=100000
MinDynamicBandwidth=40000
```