

# Easy Voice Chat

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## Documentation



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## Overview

Easy Voice Chat allows you to perform voice chat logic, all within blueprints. The Voip Manager Component handles the capture and when Voice Data is generated, a Blueprint event is called with a byte array of the voice data; which then you can send to other actors via an RPC.

The system allows an easy way to implement voice chat, and using the New Audio Engine Synth Component, you can easily add DSP (Digital Sound Processing) effects to the voice on clients. The Manager can be attached to any actor. This means you can also add voice chat within menu's, or lobby's, which is useful in games where players can be spectators.

## Technical Overview

The system works in a similar way to how the native UE4 VOIP implementation works, but instead of using a dedicated network voice channel to send and receive voice data, it uses the actor's network channel instead. This does mean that lots of voice chat data being passed around can cause network saturation, especially if there are lots of other RPC's being used. Voice Data RPC's must be reliable to ensure they arrive in the correct order, but this also can cause saturation issues as these RPCs will not be allowed to be dropped.

Every tick voice data is detected if it's captured by the Voice Capture module, and then a Blueprint event is called to provide an array of bytes, which is the compressed voice data. This byte array could be sent to any actor using Blueprint RPCs.

The system uses the USynthComponent to play back voice data which has the ability to play back procedurally generated audio. You can apply custom DSP effects to this audio to adjust its playback, for example giving it a radio filter effect.

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## Required Setup (All versions)

Please ensure you read this section after installing the plugin to configure it properly and understand how to configure it for your own needs.

### Enable Voice

The first thing you must do is enable the voice engine for your project; you can do this by going to your Config folder, and open the DefaultEngine.ini file.

You should then add the following

```
DefaultEngine - Notepad
File Edit Format View Help

[Voice]
bEnabled=true
```

This is already enabled in the example project; see this if you need more help.

### Bandwidth Configuration

Because the plugin uses the same channel as actors to send and receive voice data, it can quickly saturate it, blocking gameplay network traffic. You'll notice this if you talk on a server and move; you might see a player continue moving when they've stopped, and then snap back to their original position.

The best way to fix this is just to increase the bandwidth on the NetDriver. You can do this in your project Config settings and change or add to the following files. 50000 is a good starting value as it gives about 50kb/s of bandwidth, which is much higher than should be required. Voice chat uses up to about 10kb/s per person so this should be enough and not cause too much of a problem unless you have many players transmitting.

### DefaultEngine.ini

```
[/Script/OnlineSubsystemUtils.IpNetDriver]
MaxClientRate=50000
MaxInternetClientRate=50000
```

You should change it on the relevant subsystem NetDriver you are using. For example, if you use the Steam Online Subsystem, you should change it on that NetDriver too.

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```
[/Script/OnlineSubsystemSteam.SteamNetDriver]
MaxClientRate=50000
MaxInternetClientRate=50000
```

```
[/Script/Engine.Player]
ConfiguredInternetSpeed=500000
ConfiguredLanSpeed=500000
```

## **DefaultGame.ini**

```
[/Script/Engine.GameNetworkManager]
TotalNetBandwidth=600000
MaxDynamicBandwidth=80000
MinDynamicBandwidth=4000
```

## **Adjusting Voice Project Settings**

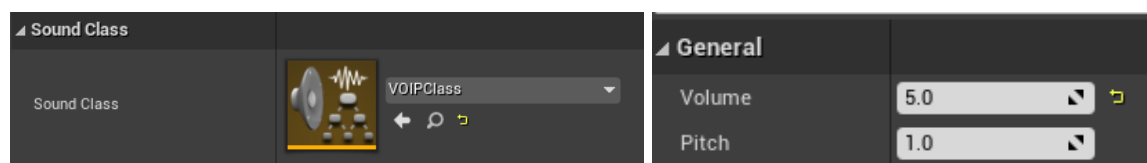
If you want to improve the quality of the voice, you can do that in the Project Settings under 'Audio'. There are only two options here, and generally you should use Low.

Another option here also is the Maximum Concurrent Streams; this will only allow a number of streaming sounds (including the Voice Playback Components) to play at the same time. You should increase this if you will have multiple players talking near each other at the same time.



## **Adjusting Playback Volume**

The voice of the person talking will generally be quiet unless their mouth is close to the microphone. To boost this audio you should apply a Sound Class to the component that is playing it back.



Within that sound class you can adjust the volume multiplier, to make it more audible. Values between 3 and 5 seem to work well here.

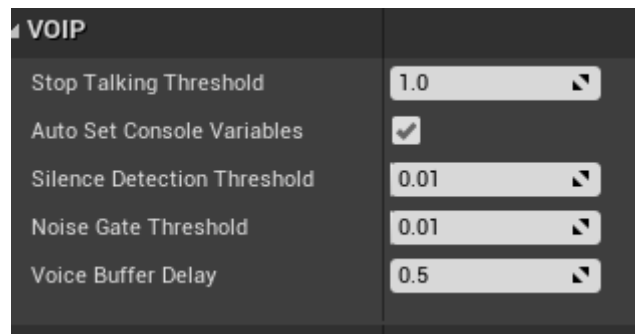
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## 4.25+ Configuration

### Configuring Voice Capture Engine

On versions 4.25+, the plugin automatically configures the engine with the optimal settings, but you can also adjust these settings on the VoipManager component if you need to. Each setting has a tooltip explaining what they're responsible for.



### All done!

Now the plugin should be set up to work as intended, and you should also understand how to configure it better for your needs. If you're on an older version of the engine (4.24 and lower), you should continue to the next part to enable the new audio engine and see how the older settings are configured.

If the voice chat isn't working, you should check the [troubleshooting guide](#) at the end of this document to work out what has gone wrong which will tell you what to do next and how to solve common problems.

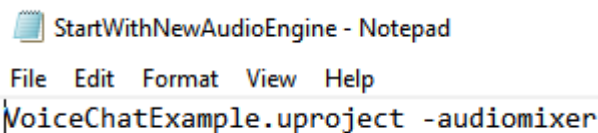
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## Older Versions

### Enabling the New Audio Engine (4.23 and lower)

The new audio engine has many useful features that can be used to apply processing to sounds with a very good performance. In the example project, you can see how this can be used to create a radio like effect. For the example project, it's enabled by a command line batch file. You can either enable the New Audio Engine for your own project this way.

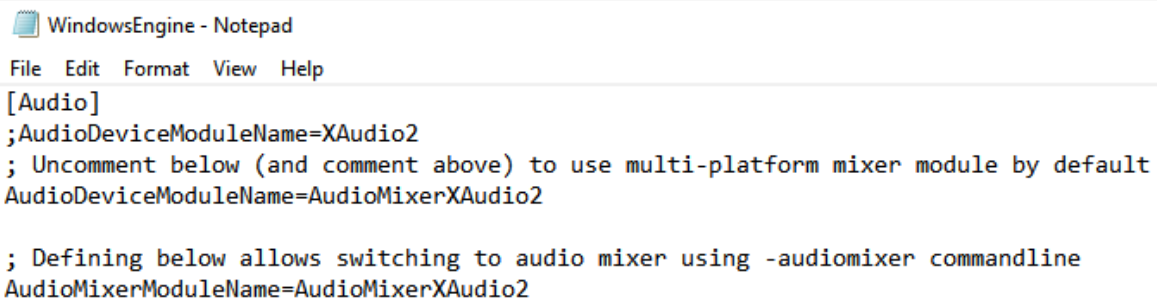


```
StartWithNewAudioEngine - Notepad
File Edit Format View Help
VoiceChatExample.uproject -audiomixer
```

Or you need to enable it per platform. Navigate to your current Engine version directory. And within it navigate to the Windows folder (and any platform you're developing for).

\Engine\Config\Windows

Then open the WindowsEngine.ini file in a text editor like Notepad.



```
WindowsEngine - Notepad
File Edit Format View Help
[Audio]
;AudioDeviceModuleName=XAudio2
; Uncomment below (and comment above) to use multi-platform mixer module by default
AudioDeviceModuleName=AudioMixerXAudio2

; Defining below allows switching to audio mixer using -audiomixer commandline
AudioMixerModuleName=AudioMixerXAudio2
```

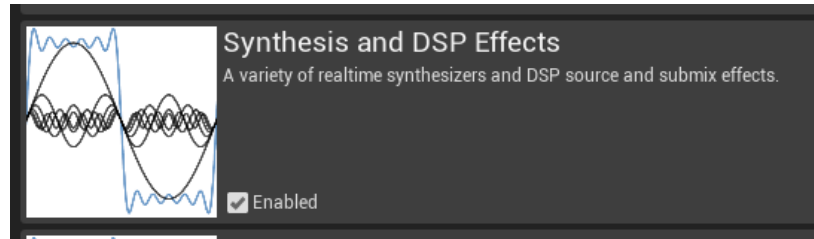
Then as shown above, comment out the AudioDeviceModuleName with the XAudio2 by using a semi-colon, and then uncomment the one with the AudioMixer. By doing this you will enable the new audio engine by default on all projects using that engine version, and you can now use new audio engine systems. More information can be found on this forum post.

<https://forums.unrealengine.com/development-discussion/audio/116874-new-audio-engine-early-access-quick-start-guide>

You should also enable the Synthesis Audio plugin if you want to get access to more DSP effects.

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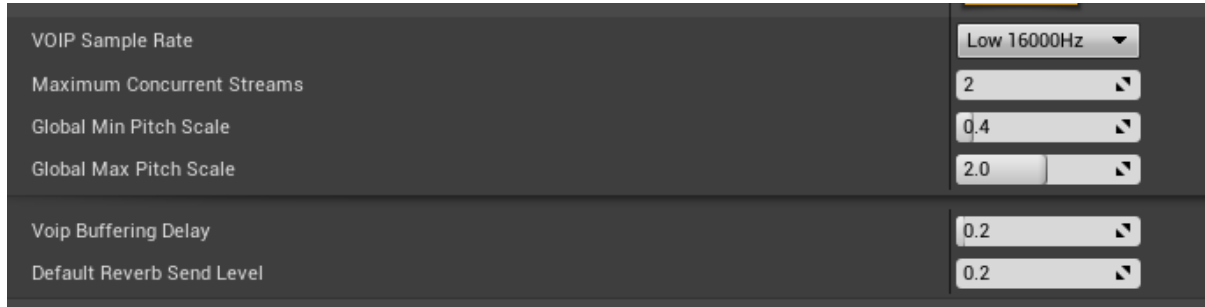


## Audio Project Settings

The plugin utilises the settings in the project setting, Audio section. You should change these values to adjust how the system works. You can increase the voice quality by increasing the sample rate, however doing this might cause packets to be dropped.

If you get warning messages about too many streaming sounds, you should increase the amount of concurrent streams. Audio components will stop streaming if there isn't any audio being played, but if there are multiple players talking at the same time, then you might want to adjust this.

If your audio is stuttering, then increasing the buffering delay might help if the connection is slower. But generally this is fine as default. You can lower this to make it more responsive and play back quicker.





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## **Configuring Voice Capture Engine (4.24 and lower)**

*If you're on an earlier version of the engine (4.24 or lower) you can adjust these variables using console commands instead. Otherwise move onto the next section.*

The plugin utilises the voice capture module to capture the voice data. There are three relevant console commands to adjust the capture.

*voice.SilenceDetectionThreshold*

This is the threshold at which the voice will stop being captured, when it falls below this value. The default is 0.08, but if you're experiencing cut outs, then you should lower the value to something like 0.01.

*voice.SilenceDetectionAttackTime*

*voice.SilenceDetectionReleaseTime*

The attack and release time adjust when the silence detection kicks in, and after what time the capture will be considered silent and then stop playing. If you find the audio continues on for too long after stopping talking, you could reduce the release time, or if it cuts out too early, you could increase the release time. Both values are in milliseconds.

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## Working with Other Platforms

The plugin might work with some platforms other than Windows which have a voice engine implemented. These are Android, Mac and Linux currently.

The first thing to do is add the platforms you want to package it for to the *EasyVoiceChat.uplugin* file in the plugin folder.

```
"Installed": true,
"Modules": [
  {
    "Name": "EasyVoiceChat",
    "Type": "Runtime",
    "LoadingPhase": "Default",
    "WhitelistPlatforms": [
      "Win32",
      "Win64",
      "Android",
      "Linux",
      "Mac"
    ]
  }
],
```

You might have to add 'SignalProcessing' to your *EasyVoiceChat.Build.cs* file like this, if it's not already there.

```
PublicDependencyModuleNames.AddRange(
    new string[]
    {
        "Core",
        "CoreUObject",
        "Engine",
        "Voice",
        "OnlineSubsystemUtils",
        "AudioMixer",
        "SignalProcessing"
        // ... add other public dependencies that you statically link with here ...
    }
);
```

If you need to recompile the plugin, it must be moved to a projects plugin folder, otherwise it won't compile.

Disclaimer: Easy Voice Chat only officially supports Windows. Support can't be provided for any issues you might encounter on these other platforms. It won't be supported in the future either; this is due to the complexity of different platforms that require platform specific knowledge, such as adding voice permissions for android applications.

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## **Troubleshooting Guide**

Before attempting troubleshooting, ensure that you've followed the starting guide properly, and the entire configuration is set up correctly.

### ***Voice cuts in and out when talking (or doesn't work at all, Init Voice function returns false)***

- Try lowering the Noise Gate and the Silence Detection threshold. You can turn these off by setting it to 0 for debug purposes
- Check your network bandwidth settings to ensure its high enough for the amount of players
- Increase the maximum concurrent streams
- Increase the buffer delay setting
- Ensure your microphone is working, is set as the default audio device in Windows and that the voice module has been enabled
- Check Init Voice function is executed on a client only

### ***Voice audio is very quiet***

- Check that a Sound Class with a volume multiplier has been applied to the component
- Check the microphone volume is set to 100 in Windows settings

### ***Voice is stuttering on playback***

- Increase the buffer delay
- Increase the network bandwidth settings
- Use reliable RPCs only

### ***Voice Start Talking and Stop Talking executes too frequently***

- Increase the 'Stop Talking Threshold' on the manager component

### ***Two people talking at the same time causes stuttering or a drop in playback quality***

- This is usually because you are sending audio to the same audio component – You should only send voice data to one audio component at a time to be played back, such as in the example project

### ***Multiple people talking at the same time starts to cut out***

- Increase the 'Maximum Concurrent Streams' setting in the Audio Project Settings

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## ***My problem isn't mentioned here***

- Firstly check the example project and see if the problem exists and can be replicated there. If not, investigate potential issues with your own project.
- Otherwise, send an email to [support@313-studios.com](mailto:support@313-studios.com) explaining what the issue is, and what engine version you're on. Please also mention that you've completed the troubleshooting guide, otherwise you might be redirected to check this first and that will delay your support request. Remember that support can only be provided for issues you encounter on Windows. Thanks!

## **Changelog and Update Notes**

### **1.2 (4.25+)**

- Automatically set required console variables for easier setup
- Increased Stop Talking Threshold defaults
- Added SignalProcessing to Build.cs file to make deploying for non-supported platforms easier
- Minor improvements to the example project showing how to add a sound class to increase audio playback volume, fixed an issue with the lobby example

### **1.3 (4.26+)**

- Added ability to change devices
- Improved example project
  - How to change devices and save/load changes.
  - The simple voice chat example now uses teams for the radio system
  - Comments improved

### **Version Notes**

*If you previously set the console variables globally, you should disable 'Auto Set Console Variables' on your VOIP Managers to prevent it from overriding this.*