

# RT-Voice PRO

*Hearing is understanding*



Documentation

**crosstales** LLC

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**Thank you for buying our asset “RT-Voice PRO”!**

If you have any questions about this asset, send us an email at [rtvoice@crosstales.com](mailto:rtvoice@crosstales.com). Please don't forget to rate it or write a little review – it would be very much appreciated.

## 1. Overview

Did you ever want to make a game for people with **visual impairments** or **reading difficulties**? Or want your players to **not have to read too much**? Or would you listen to just the dialogues in your game **without consulting a voice-actor** in early stages of development? Then RT-Voice is your **time-saving** solution to do so!

RT-Voice uses TTS-voices already integrated in your system to pronounce any written text at runtime.

All of this happens without intermediate steps: the transformation effects **instantaneously** - and, if needed, **simultaneously**!

## 2. Features

### 2.1. Convert text to voice

- **Instant conversion** from text to speech - generated **during runtime!**
- **Side effect:** the continuous audio generation **saves a lot of memory!**
- **No need for voice actors** during the testing phase of your game!
- **Several voices at once** are possible (e.g. for scenes in a public place, where many people are talking at the same time)
- **Fine tuning** for your voices with **speed, pitch** and **volume!**
- Support for [SSML](#) and [EmotionML](#)!
- **Current word, visemes** and **phomenes** on Windows and iOS - including **marker functions!**
- Generated audio **can be stored** in files reusable within Unity!
- **1-infinite synchronized speakers** for a single AudioSource!
- Simple **sequence** and **dialogue system**
- **No performance drops!**

### 2.2. Documentation & control

- **Test** voices within the editor!
- Powerful [API](#) for **maximum control!**
- Detailed **demo scenes!**
- Comprehensive [documentation](#) and **support!**
- Full **C# source code**

### 2.3. Compatibility

- Supports **all build platforms** (thanks to [MaryTTS](#))!
- Works with **Windows, Mac** and **Linux editors!**
- Compatible with **Unity 5.3 – Unity 2017**
- Supports **AR** and **VR!**
- Works with [Online Check](#)
- [PlayMaker](#) actions!

## 2.4. Supported third-party assets

- [SALSA](#)
- [Localized Dialogs & Cutscenes \(LDC\)](#)
- [Dialogue System for Unity](#)
- [THE Dialogue Engine](#)
- [PlayMaker](#)
- [Adventure Creator](#)
- [LipSync](#)
- [SLATE](#)
- [Cinema Director](#)
- [uSequencer](#)
- [Quest System Pro](#)
- [NPC Chat](#)

## 2.5. Platform-specific limitations

### 2.5.1. Windows

- Native rate is internally limited to 20 logarithmic distributed steps
- .NET 4.0 or higher must be installed
- Support for SSML
- Minimum Windows version: 7
- Maximal number of characters per speech: 32'000 (>35min)

**Important note:** not all SAPI-voices support SSML! If you experience a wrong voice speaking your text, the selected voice is most likely not SSML-compatible. In this case, remove all SSML-tags from your text and let RTV speak again.

### 2.5.2. MacOS

- Native pitch has no effect
- Native volume has no effect
- No current words, phonemes and visemes
- Minimum macOS version: 10.6
- Maximal number of characters per speech: 256'000 (>4h 45min)

### 2.5.3. Android

- Only one native voice at the time (can be solved by generating audio)
- No current words, phonemes and visemes
- Minimum Android version: 4.0.3 (API 15)
- Maximal number of characters per speech: 3'999 (>5min)

### 2.5.4. iOS

- Only one active native voice at the time
- No audio generation
- Current word but no phonemes and visemes
- Minimum iOS-version: 8.0
- Maximal number of characters per speech: n/a

### 2.5.5. WSA (UWP)

- No native audio (only generated audio files)
- Native rate has no effect
- Native pitch has no effect
- Native volume has no effect
- No current words, phonemes and visemes
- Minimum SDK-version: 10.0
- Maximal number of characters per speech: 64'000 (>1h 15min)

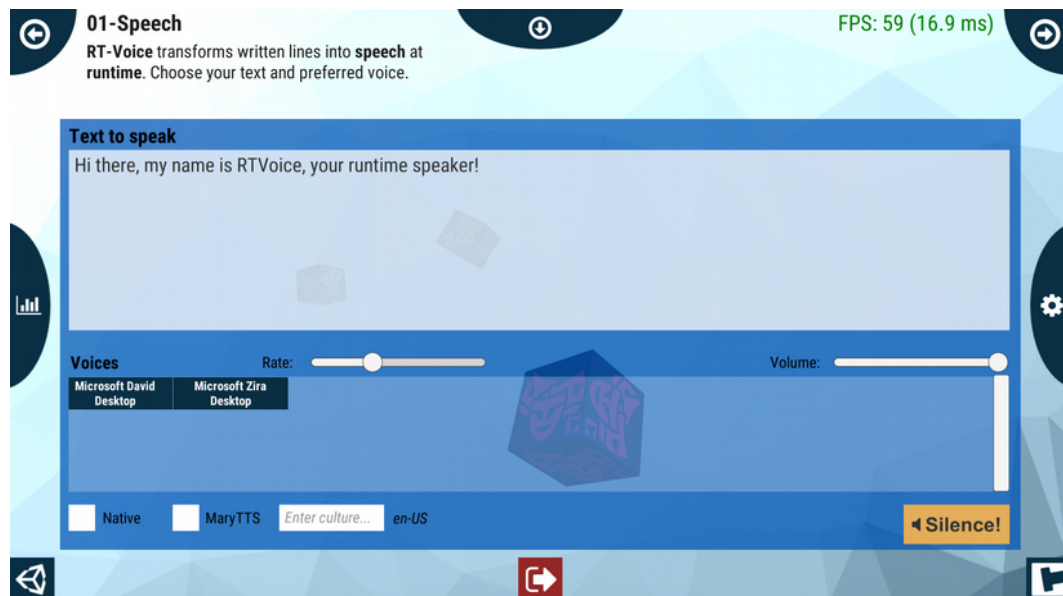
### 2.5.6. MaryTTS

- No native audio (only generated audio files)
- No current words, phonemes and visemes
- Support for RAWMARYXML, SSML and EmotionML
- Minimum MaryTTS-version: 5.0
- Maximal number of characters per speech: depends on the server request size, but 8'000 (>10min) is realistic. Higher numbers can lead to timeouts.

## 3. Demonstration

The asset comes with many demo scenes to show the main usage.

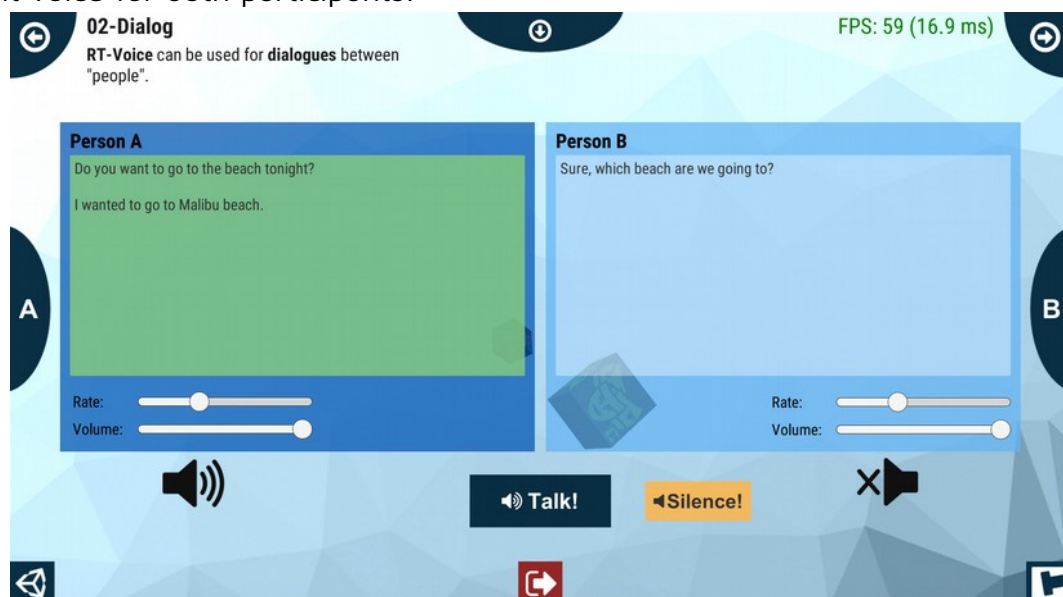
### 3.1. Speech



This demo scene shows how to transform written lines into speech. Choose your preferred voice.

### 3.2. Dialog

In this demo scene you can act out a dialogue between two "people". You can choose a different voice for both participants.





### 3.3. SimpleNative

The “SimpleNative” scene shows the easiest way for native audio.



### 3.4. Simple

The “Simple” scene shows the easiest and recommended way for most purposes with generated audio.



### **3.5. 3DAudio**

This scene demonstrates 3D positioned and looped audio.

Needs the Unity Standard Characters (Assets → Import Packages → Characters).

### **3.6. Loudspeakers**

This scene demonstrates 3D positioned loudspeakers with only one audio origin (looped).

Needs the Unity Standard Characters (Assets → Import Packages → Characters).

### **3.7. SendMessage**

This scene shows the usage of Unity's "SendMessage".

### **3.8. Sequencer**

This scene shows the usage of our simple sequencer.

### **3.9. Exact and Exact\_Native**

These two scenes are showing how you can build applications with exact timing between audio and animations (e.g. lip sync).

### **3.10. SpeechText**

This scene shows how to speak or store generated audio (see the result inside the folder "\_generatedAudio").

### **3.11. SpeechText**

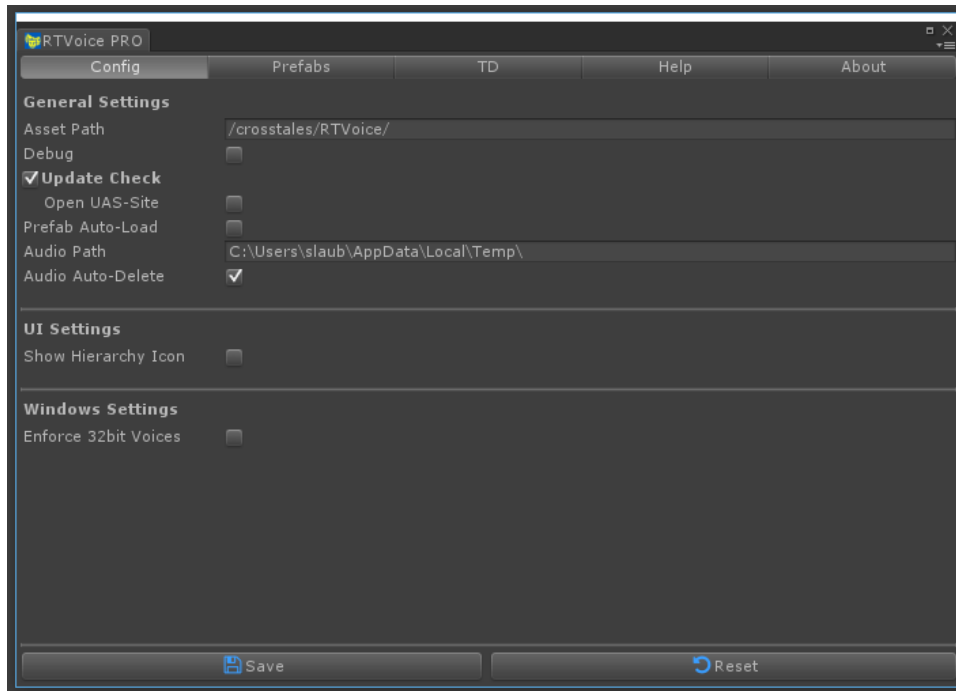
This scene shows how to speak text files with a voice (e.g. random dialogues of NPCs).

### **3.12. AudioFileGenerator**

This scene shows how-to generate audio files from text files.

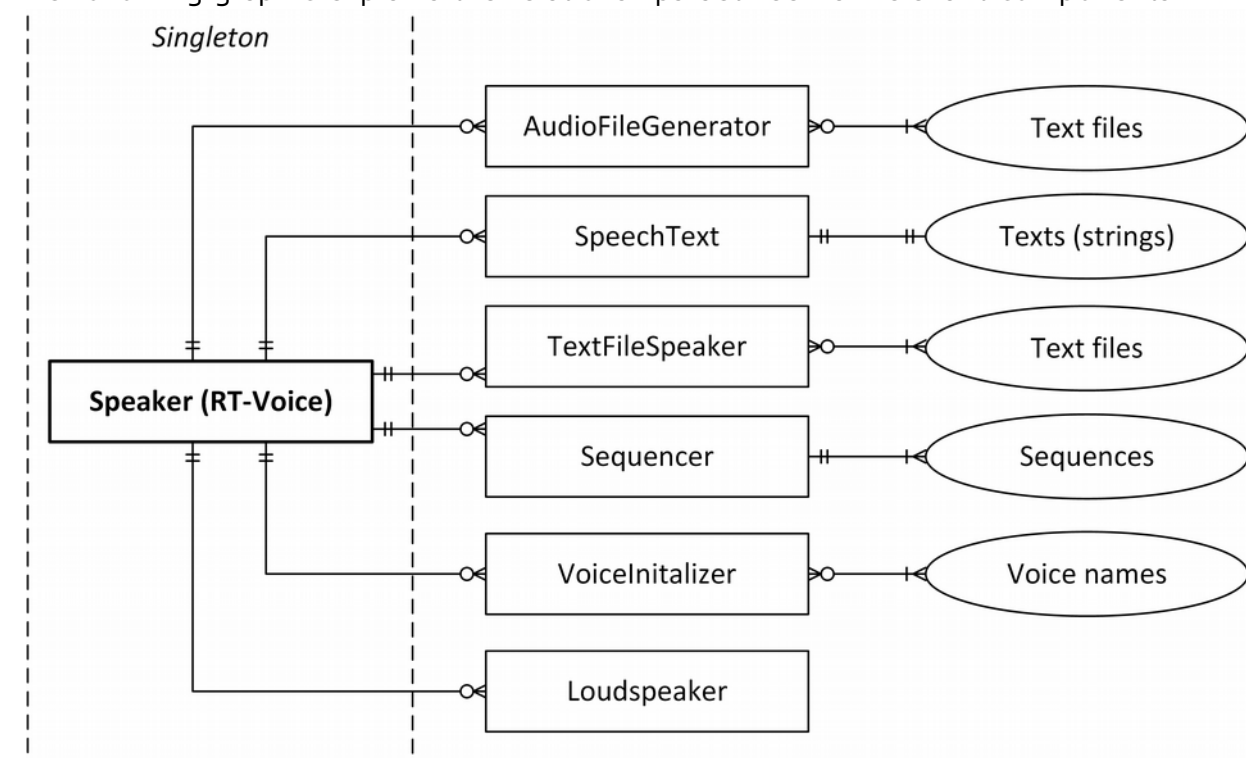
## 4. Setup

RT-Voice has global settings under “Edit\Preferences...” and under “Tools\RTVoice PRO\Configuration...”:



### 4.1. Schema

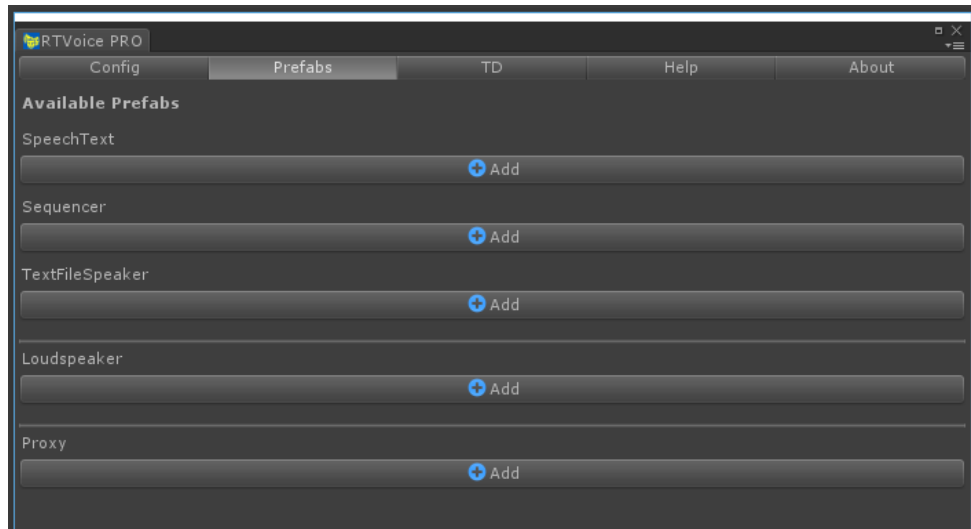
The following graphic explains the relationships between all relevant components:



## 4.2. Add RT-Voice

There are four ways to add RT-Voice to your project:

1. Add the prefab **RTVoice** from Assets/Plugins/crosstales/RTVoice/Prefabs to the scene
2. Or go to *Tools => RTVoice PRO => Prefabs => RTVoice*
3. Right-click in the *hierarchy-window => RTVoice PRO => RTVoice*
4. Add it from the Prefabs-tab:



## 4.3. Other components

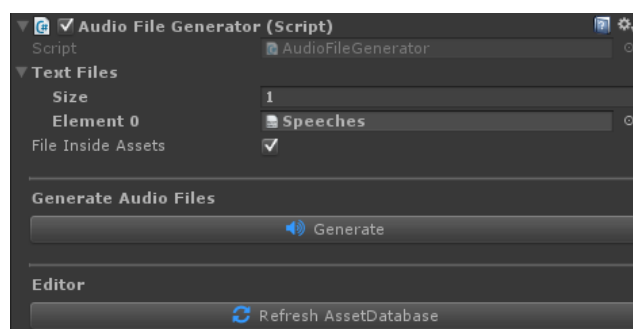
The other components can be added in the same way as "RTVoice".

### 4.3.1. AudioFileGenerator

This scene generates audio files from text files with lines like:

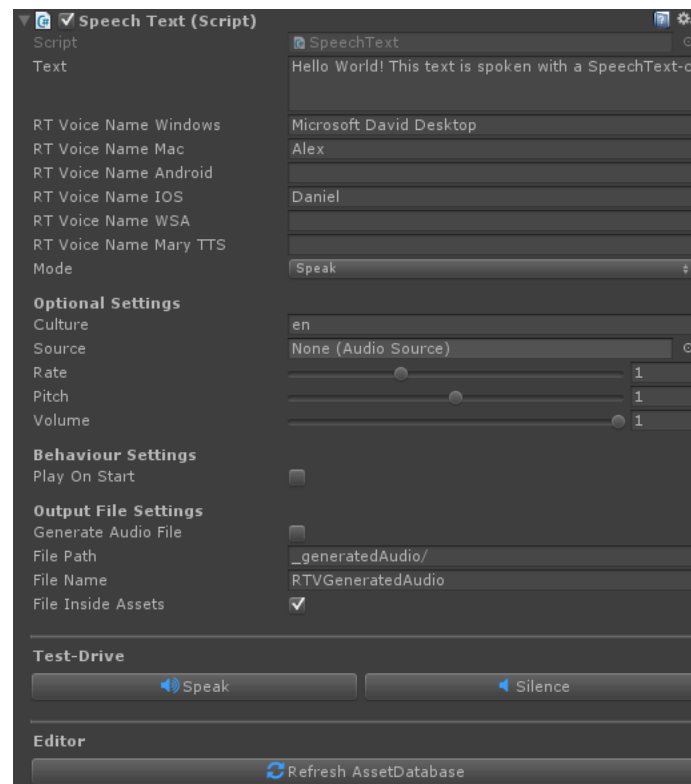
`#Text;Output file (without extension);Voice name;Rate;Pitch;Volume`

`This is a test speech;Speeches\Mary01;cmu-slt-hsmm;1.2;0.85;0.95`



### 4.3.2. SpeechText

Allows to speak and store generated audio.

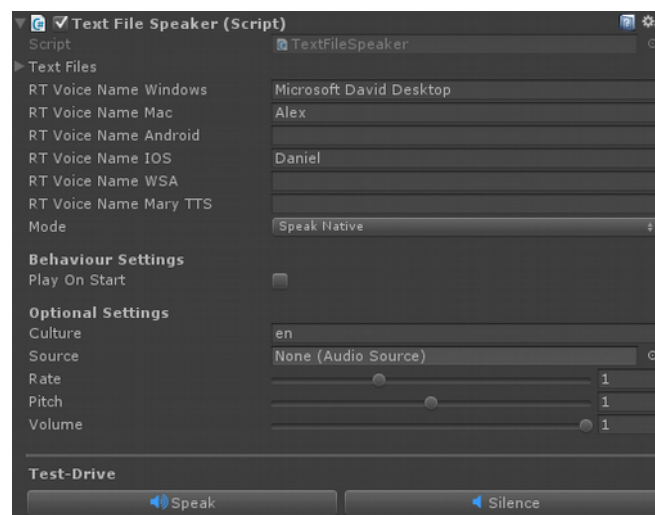


### 4.3.3. Sequencer

Simple sequencer for dialogues.

### 4.3.4. TextFileSpeaker

Allows to speak text files.



#### 4.3.5. Loudspeaker

Loudspeaker for an AudioSource.

This is useful to use a speech on multiple locations in the game.

#### 4.3.6. VoiceInitializer

This component allows to initialize voices to provide lag-free speeches. It's especially useful for Android.

Add it together with RT-Voice to your first scene (e.g. splash screen).

### 4.4. Differences between standard and native mode

In the **standard** mode the TTS-system of your OS will **convert** your text to an **audio** file and return it to **Unity** as an "**AudioSource**" for further use (like changing the volume, pitch etc.).

On the other hand, the **native** mode **delegates** the speech-task **entirely** to the underlying TTS-system (outside of Unity). You are **losing** some **control** but it uses slightly **less performance**.

We clearly **recommend** using the **standard** mode.

## 4.5. Speaker.cs vs. LiveSpeaker.cs

"Speaker.cs" is the main class of "RT-Voice" and presents the API via static methods. "LiveSpeaker.cs" on the other hand is a wrapper for "Speaker.cs" and presents the API as normal C#-instance via public methods. The main usage of "LiveSpeaker.cs" is as a receiver for "SendMessage"-calls.

## 4.6. MaryTTS

MaryTTS is an open-source TTS with a server, client and many voices.

It enables TTS under all Unity platforms.

You can customize everything by yourself, just follow their guides:

<http://mary.dfki.de/>

To enable MaryTTS, simply check "MaryTTS" in the RTVoice-component and configure the URL and port.

### 4.6.1. Important

The default server in RT-Voice is the test server from MaryTTS.

**Never release** a product with the **default configuration** and install your own server (local/remote)!

### 4.6.2. Account for our MaryTTS-service

We offer a service for MaryTTS. It's currently free and in early beta-stage, this means it could be sometimes slow or unavailable.

If you're interested in getting a test account, [contact us](#).

### 4.6.3. Installation guide

We created a guide which should help you install a MaryTTS-server with HTTPS (needed for the WebGL-platform).

You can find it under "Assets/crosstales/RTVoice/Documentation/MaryTTS.pdf".

## 5. API

The asset contains various methods and the most important are explained here.

Make sure to **include** the **name space** in your relevant source files:

```
using Crosstales.RTVoice;
```

### 5.1. Speaker

The "Speaker.cs" is a singleton and contains the following static methods.

#### 5.1.1. Speak

Speaks a text with a given voice and optional AudioSource.

For example:

```
//Immediately speak "hello world" with the first available voice  
Speaker.Speak("hello world", audioSource);
```

```
//Immediately speak "hello world" with the first English voice (if available  
else it uses the first voice on your OS)  
Speaker.Speak("hello world", audioSource, Speaker.VoiceForCulture("en"));
```

```
// Prepare speak "hello world" with the first available voice (without  
AudioSource.Play() - this is up to you). With this technique, you can prepare  
all audio texts of a scene and you can modify the AudioSource as you like!  
Speaker.Speak("hello world", audioSource, null, false);
```

#### 5.1.2. SpeakNative

Speaks a text with a given voice.

For example:

```
//Speak "hello world" with the first available voice  
Speaker.SpeakNative("hello world");
```

```
//Speak "hello world" with the first English voice (if available else it uses  
the first voice on your OS)  
Speaker.SpeakNative("hello world", Speaker.VoiceForCulture("en"));
```



### 5.1.3. Silence

Silence all active TTS-voices.

Example:

```
//Silence all voices  
speaker.Silence();
```

### 5.1.4. Voices

```
List<Voice> Voices
```

Returns all available voices (alphabetically ordered by 'Name').

### 5.1.5. VoicesForCulture

```
List<Voice> VoicesForCulture(string culture)
```

Returns all available voices for a given culture (alphabetically ordered by 'Name').

### 5.1.6. VoiceForCulture

```
voice voiceForCulture(string culture, int index)
```

Returns the voice for the given culture and index.

### 5.1.7. VoiceForName

```
Voice voiceForName(string name)
```

Returns the voice for the given name or null if not found.

### 5.1.8. Cultures

```
List<string> Cultures
```

Returns all available cultures (alphabetically ordered by 'Culture').

## 5.2. Callbacks

There are various callbacks available. Subscribe them in the "OnEnable"-method and unsubscribe in "OnDisable".

### 5.2.1. Voices ready

```
VoicesReady();
```

```
VoicesReady OnVoicesReady;
```

Triggered as soon as the voices of a provider are ready to use.

### 5.2.2. Speak start and complete

```
SpeakStart(wrapper wrapper);
```

```
SpeakStart OnSpeakStart;
```

Triggered whenever a speak is started.

```
SpeakComplete(wrapper wrapper);
```

```
SpeakComplete OnSpeakComplete;
```

Triggered whenever a native speak is completed.

### 5.2.1. Current word (native, Windows and iOS only)

```
SpeakCurrentWord(wrapper wrapper, string[] speechTextArray, int wordIndex);
```

```
SpeakCurrentWord OnSpeakCurrentWord;
```

Triggered whenever a new word is spoken (native, Windows and iOS only).

### 5.2.2. Current phoneme (native, Windows only)

```
SpeakCurrentPhoneme(wrapper wrapper, string phoneme);
```

```
SpeakCurrentPhoneme OnSpeakCurrentPhoneme;
```

Triggered whenever a new phoneme is spoken (native mode, Windows only).

### 5.2.3. Current viseme (native, Windows only)

```
SpeakCurrentViseme(wrapper wrapper, string viseme);
```

```
SpeakCurrentViseme OnSpeakCurrentViseme;
```

Triggered whenever a new viseme is spoken (native mode, Windows only).

#### 5.2.4. Speak audio generation start and complete

`SpeakAudioGenerationStart(wrapper wrapper);`

`SpeakAudioGenerationStart` **`OnSpeakAudioGenerationStart`**;

Triggered whenever a speak audio generation is started.

`SpeakAudioGenerationComplete(wrapper wrapper);`

`SpeakAudioGenerationComplete` **`OnSpeakAudioGenerationComplete`**;

Triggered whenever a speak audio generation is completed.

#### 5.2.5. Provider change

`ProviderChange(string provider);`

`ProviderChange` **`OnProviderChange`**;

Triggered whenever a provider changes (e.g. from Windows to MaryTTS).

#### 5.2.6. Errors

`ErrorInfo(string info);`

`ErrorInfo` **`OnErrorInfo`**;

Triggered whenever an error occurs.

### 5.2.7. Example

Get informed when a speak starts and completes:

```
void OnEnable() {
    // Subscribe event listeners
    Speaker.OnSpeakStart += speakStartMethod;
    Speaker.OnSpeakComplete += speakCompleteMethod;

    Speaker.SpeakNative("Hello world!");
}

void OnDisable() {
    // Unsubscribe event listeners
    Speaker.OnSpeakStart -= speakStartMethod;
    Speaker.OnSpeakComplete -= speakCompleteMethod;
}

private void speakStartMethod(wrapper wrapper) {
    Debug.Log("speakStartMethod: " + wrapper);
}

private void speakCompleteMethod(wrapper wrapper) {
    Debug.LogWarning("speakCompleteMethod: " + wrapper);
}
```

## 5.3. Complete API

For more details, please see the [RTVoice-api.pdf](#)

## 6. Additional voices

RT-Voice works great with third-party voices (e.g. [IVONA](#), [Cereproc](#) etc.).

### 6.1. Windows

All SAPI5-compatible voices are supported. Microsoft also provides a wide range of voices for different languages:

<https://www.microsoft.com/en-us/download/details.aspx?id=27224>

To install and use those voices follow this manual:

<http://superuser.com/a/872573>

#### 6.1.1. Important

**Don't install** those Microsoft voices or RTVoice won't work:

- hui hui
- hun yee
- han han

### 6.2. MacOS

Apple delivers many voices for different languages. To add or customize them, follow the tutorial below:

<http://osxdaily.com/2011/07/25/how-to-add-new-voices-to-mac-os-x/>

### 6.3. Android

You can add various voices on your Android phone:

<http://www.geoffsimons.com/2012/06/7-best-android-text-to-speech-engines.html>

There is also a possibility to download high quality voices:

<http://www.androidauthority.com/google-text-to-speech-engine-659528/>

## 6.4. iOS

You can only change the quality of the installed voices:

<https://support.apple.com/en-us/HT202362>

## 6.5. WSA (UWP)

No information so far. If you know a working guide, please let us know.

## 6.6. MaryTTS

Follow those guides:

<http://mary.dfki.de/>

## 7. Third-party support (PlayMaker etc.)

„RT-Voice“ supports various assets from other publishers. Please import the desired packages from the „3rd party“-folder.

## 8. Verify installation

Check if RT-Voice is installed:

```
#if CT_RTV
    Debug.Log("RTV installed: " + Util.Constants.ASSET_VERSION);
#else
    Debug.LogWarning("RTV NOT installed!");
#endif
```

## 9. Upgrade to new version

Follow this steps to upgrade your version of "RT-Voice PRO":

1. Update "RT-Voice PRO" to the latest version from the "Unity AssetStore"
2. Inside your project in Unity, go to menu "File" => "New Scene"
3. Delete the "Assets/Plugins/crosstales/RTVoice" folder from the Project-view<sup>1</sup>
4. Import the latest version downloaded from the "Unity AssetStore"

## 10. Important notes

After this setup, the "RT-Voice" is ready to use. It is important to know that it uses the **singleton**-pattern, which means that **once instantiated**, the "RT-Voice" will **live until** the application is **terminated**.

**Remember:** it must be instantiated before you try to access it! Otherwise it's not possible to use it.

## 11. Problems, improvements etc.

If you encounter any problems with this asset, just [send us an email](#) with a problem description and the invoice number and we will try to solve it.

## 12. Release notes

See "VERSIONS.txt" under "Assets/crosstales/RTVoice/Documentation".

## 13. Credits

The icons are based on [Font Awesome](#).

<sup>1</sup> Before 2.9.3: Assets/crosstales/RTVoice

## 14. Contact and further information

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CH-8002 Zürich

Homepage: <https://www.crosstales.com/en/portfolio/rtvoice/>

Email: [rtvoice@crosstales.com](mailto:rtvoice@crosstales.com)

AssetStore: <https://goo.gl/qwtXyb>

Forum: <http://goo.gl/Z6MZMI>

Documentation: <https://www.crosstales.com/media/data/assets/rtvoice/RTVoice-doc.pdf>

API: <http://goo.gl/6w4FyO>

WebGL-Demo: <https://www.crosstales.com/media/data/assets/rtvoice/webgl/>









Windows-Demo: [https://www.crosstales.com/media/data/assets/rtvoice/downloads/RTVoice\\_demo\\_win.zip](https://www.crosstales.com/media/data/assets/rtvoice/downloads/RTVoice_demo_win.zip)

Mac-Demo: [https://www.crosstales.com/media/data/assets/rtvoice/downloads/RTVoice\\_demo\\_mac.zip](https://www.crosstales.com/media/data/assets/rtvoice/downloads/RTVoice_demo_mac.zip)

Android-Demo: <https://www.crosstales.com/media/rtvoice/RTVoice.apk>



## 15. Our other assets

 <a href="#">Bad Word Filter</a>	<p>The "Bad Word Filter" (aka profanity or obscenity filter) is exactly what the title suggests: a tool to filter swearwords and other "bad sentences".</p>
 <a href="#">DJ</a>	<p>DJ is a player for external music-files. It allows a user to play his own sound inside any Unity-app. It can also read ID3-tags.</p>
 <a href="#">File Browser</a>	<p>File Browser is a simple, free wrapper for native file dialogs on Windows and macOS.</p>
 <a href="#">Online Check</a>	<p>You need a reliable solution to check for <b>Internet availability</b>? Here it is!</p>
 <a href="#">Radio</a>	<p>Radio allows implementing free music from Internet radio stations into your project.</p>
 <a href="#">RSockpol</a>	<p>Reliable Socket Policy Server which acts as replacement for Unitys own „sockpol.exe“.</p>
 <a href="#">TPS</a>	<p>Turbo Platform Switch is a Unity editor extension to reduce the time for assets to import during platform switches. We measured speed improvements up to 100x faster than the built-in switch in Unity.</p>
 <a href="#">True Random</a>	<p>True Random can generate "true random" numbers for you and your application. The randomness comes from atmospheric noise, which for many purposes is better than the pseudo-random number algorithms typically used in computer programs.</p>