

# Google Cloud Speech



# Google Cloud Platform

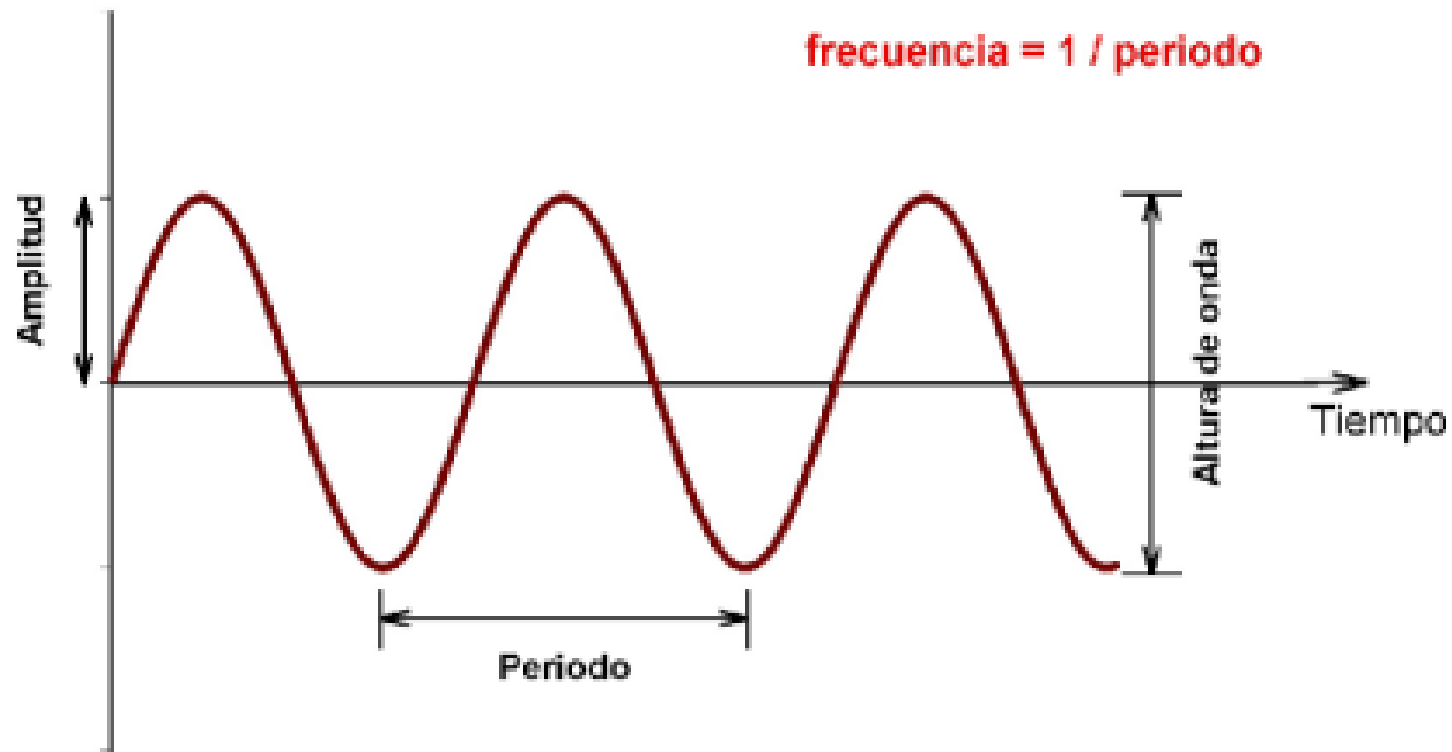
[API](#) to convert audio to test

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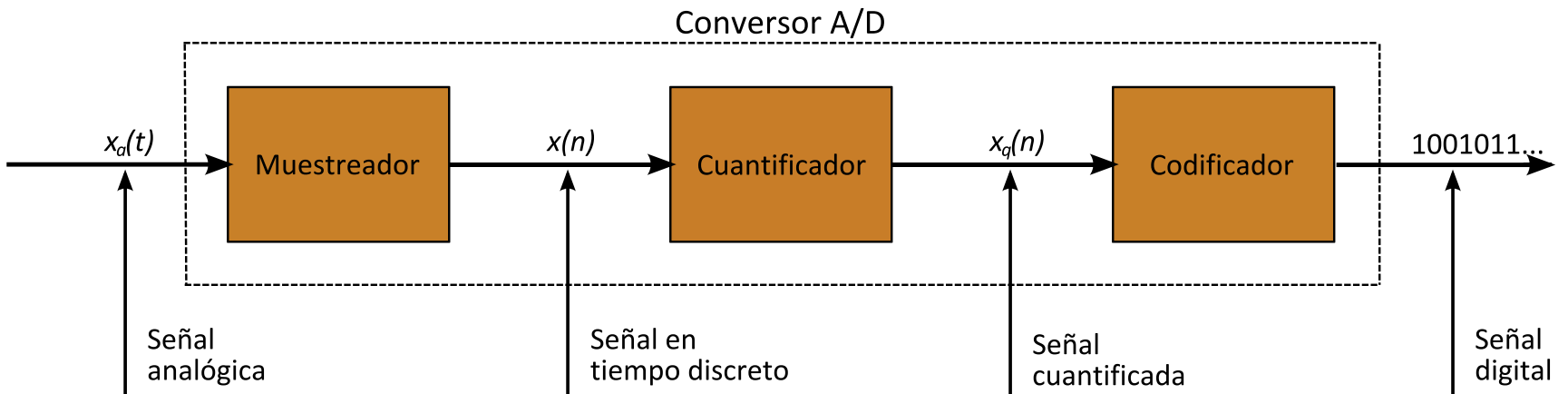
# Introduction

- API to convert audio to text.
- Powerful neural network models in an easy to use API.
- Recognizes over 80 languages and variants.
- Accuracy improves over time.
- Return text result in real-time.
- Accurate in noisy environments.

# Sound



# A/D converter



# Audio encoding

It has the following parameters:

- Channel.
- Sampling.
- Digital resolution.
- Bit rate.
- Lossy compression.

# Audio formats

- Note that audio format is not equivalent to audio encoding.
- Defines the format of the header of an audio file.
- Don't assume a kind of file has any particular encoding until you inspect its header.
- However, there is a 'format' like `FLAC` which is both a file format and an encoding.

# Ways to use the API

- REST.
- Client libraries.
- RPC.

# API Rest

- All URIs below are relative to <https://speech.googleapis.com>
- This service provides the following discovery document:  
[https://speech.googleapis.com/\\$discovery/rest?version=v1](https://speech.googleapis.com/$discovery/rest?version=v1)



# Speech Recognition

- Performs asynchronous speech recognition.
- `POST /v1/speech:longrunningrecognize`

```
{  
  "config": { #information to the recognizer  
    object(RecognitionConfig)  
  },  
  "audio": { # audio data  
    object(RecognitionAudio)  
  },  
}
```

# Speech Recognition

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```

# Speech Recognition

- In `longrunningrecognize` the response contains an instance of `Operation` .
- In `recognize` the response is:

```
{  
  "results": [ # Array for alternatives  
    {  
      object(SpeechRecognitionResult)  
    },  
  ],  
}
```

# Speech Recognition

- In asynchronous, we can get the latest status of a long-running operation.
- `GET /v1/operations/{name}`

# Speech Recognition

- Response for operation resource:

```
{
  "name": string,
  "metadata": {
    "@type": string,
    field1: ...,
    ...
  },
  "done": boolean,
  "error": { # error case, done equals to false
    object(Status)
  },
  "response": { # success case, done equals to true
    "@type": string,
    field1: ...,
    ...
  }, # Could be several responses
}
```

# Client libraries

- There are several client libraries: C#, GO, Java, Node.js, PHP, Python and Ruby.
- In python we must use PIP to install the client library:

```
pip install --upgrade google-cloud-speech
```

- In Java we must use Maven o Gradle to provide the dependency for our project:

```
<dependency>  
  <groupId>com.google.cloud</groupId>  
  <artifactId>google-cloud-speech</artifactId>  
  <version>0.17.1-alpha</version>  
</dependency>
```

# Client libraries

- At now, just import it.

```
# Imports the Google Cloud client library  
from google.cloud import speech  
  
# Instantiates a client  
speech_client = speech.Client()  
  
# Rest of code
```

# Code

```
import io
import os
from google.cloud import speech

class Audio_2_Text(object):

    def __init__(self, file_name, audio_lang):
        self.speech_client = speech.Client()
        self.file_name = file_name
        self.audio = None
        self.audio_lang = audio_lang
```



## Code

```
def find_file(self):  
    self.file_name = os.path.join(  
        os.path.dirname(__file__),  
        '..',  
        self.file_name  
    )
```

# Code

```
def load_audio(self):  
    with io.open(self.file_name, 'rb') as audio_file:  
        content = audio_file.read()  
        self.audio = speech_client.sample(  
            content,  
            source_uri=None,  
            encoding='LINEAR16',  
            sample_rate_hertz=16000  
        )
```

# Code

```
def recognize(self):  
    alternatives = self.audio.recognize(self.audio_lang)  
    return '{}'.format(alternatives[0].transcript)
```

# Code

```
if __name__ == "__main__":  
    ...  
  
    audio_2_text = Audio_2_Text(args.audio_file,  
                                audio_lang)  
    audio_2_text.find_file()  
    audio_2_text.load_audio()  
    text_to_predict = audio_2_text.recognize()  
  
    ...
```

# More examples



More examples disponibles en [Github](#)

# Behind Google Cloud Speech

- Tensor flow models on Clouds TPUs Technology.



Python integration demo



Any questions?

**THANKS!**

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