Speech-to-Text API: Qwik Start

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1. Introduction

This lab demonstrates the **Google Cloud Speech-to-Text API**, which converts spoken audio into written text. Key features explored:

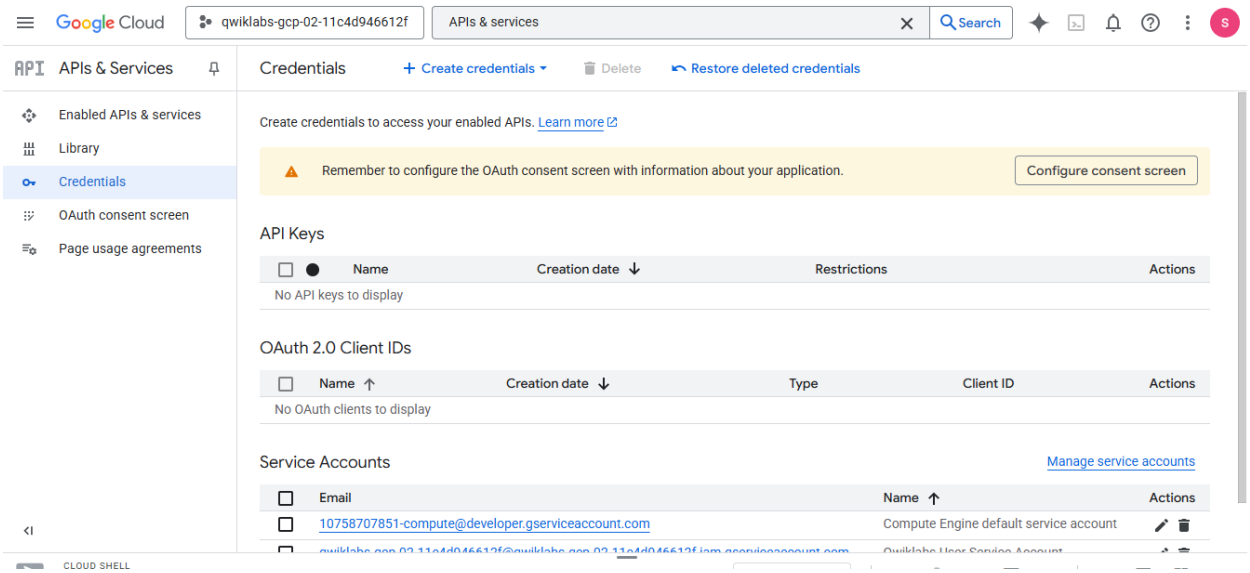
- **Synchronous transcription** of pre-recorded audio files.
- **Language detection** (English, in this case).
- **Confidence scoring** for accuracy assessment.

2. Task 1: Creating an API Key

Steps Executed:

1. Navigated to **APIs & Services > Credentials** in the Cloud Console.
2. Generated a new **API key** for authentication.
3. Saved the key as an environment variable in the SSH session:

```
export API_KEY="YOUR_API_KEY"
```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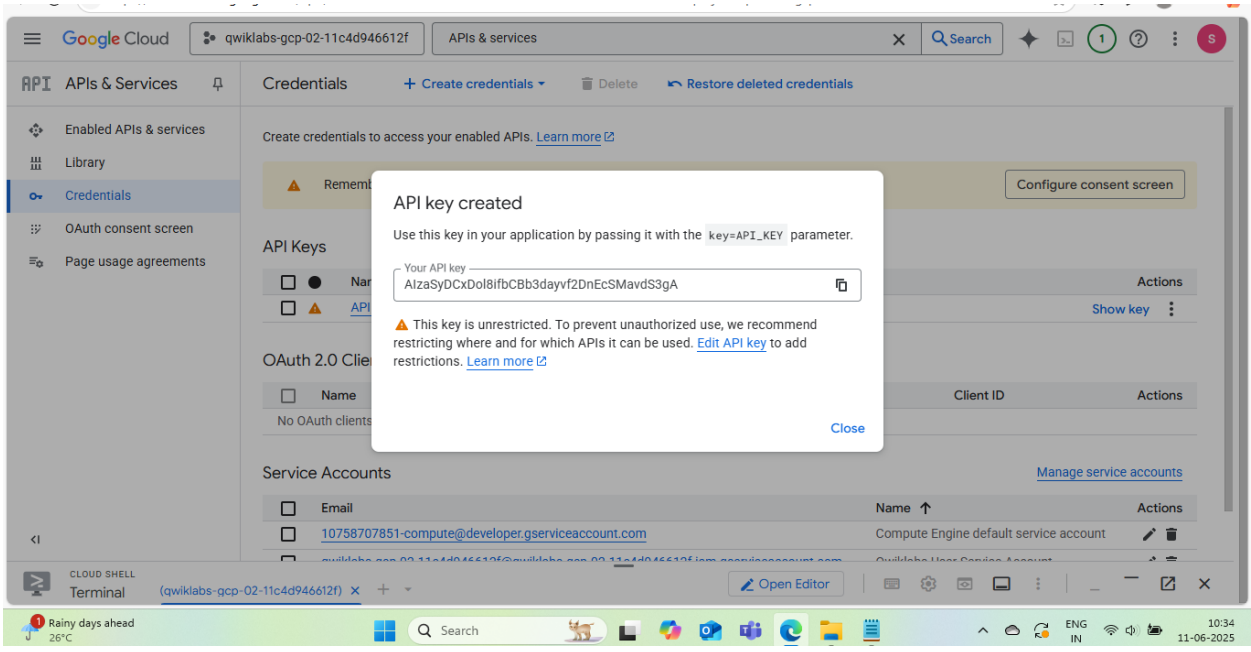
CLOUD SHELL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API key created
Use this key in your application by passing it with the key=API_KEY parameter.
Your API key
AIzaSyDCxDol8ifbCBb3dayvf2DnEcSMavdS3gA
This key is unrestricted. To prevent unauthorized use, we recommend restricting where and for which APIs it can be used. Edit API key to add restrictions. Learn more
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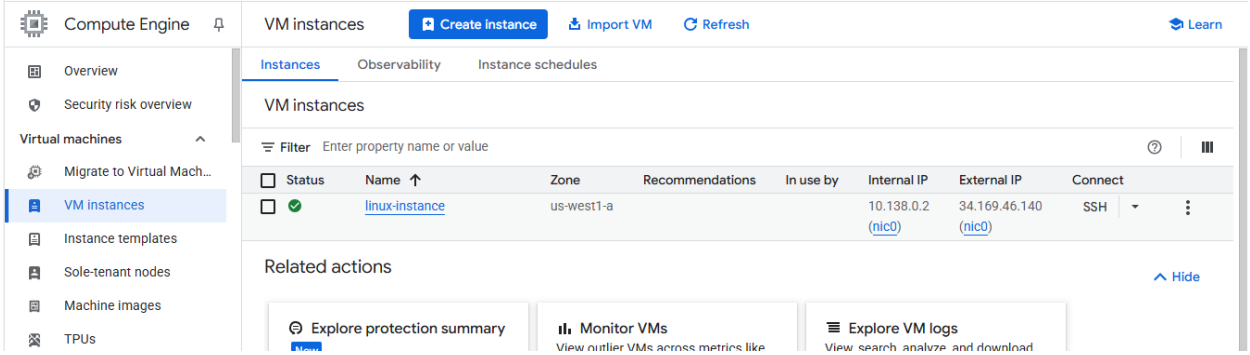
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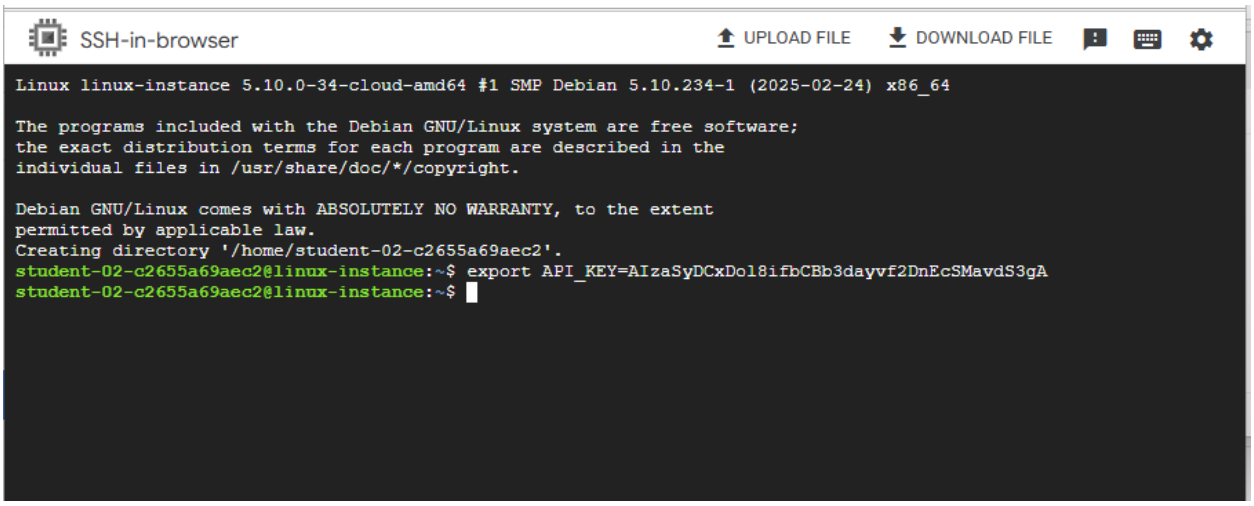


Purpose:

- Securely authenticate requests to the Speech-to-Text API.

3. Task 2: Preparing the API Request

Audio File Used:

- **Source**: gs://cloud-samples-tests/speech/brooklyn.flac
- **Content**: *"How old is the Brooklyn Bridge?"*

Request Configuration:

Created request.json with:

{

"config": {

"encoding": "FLAC",

"languageCode": "en-US"

},

"audio": {

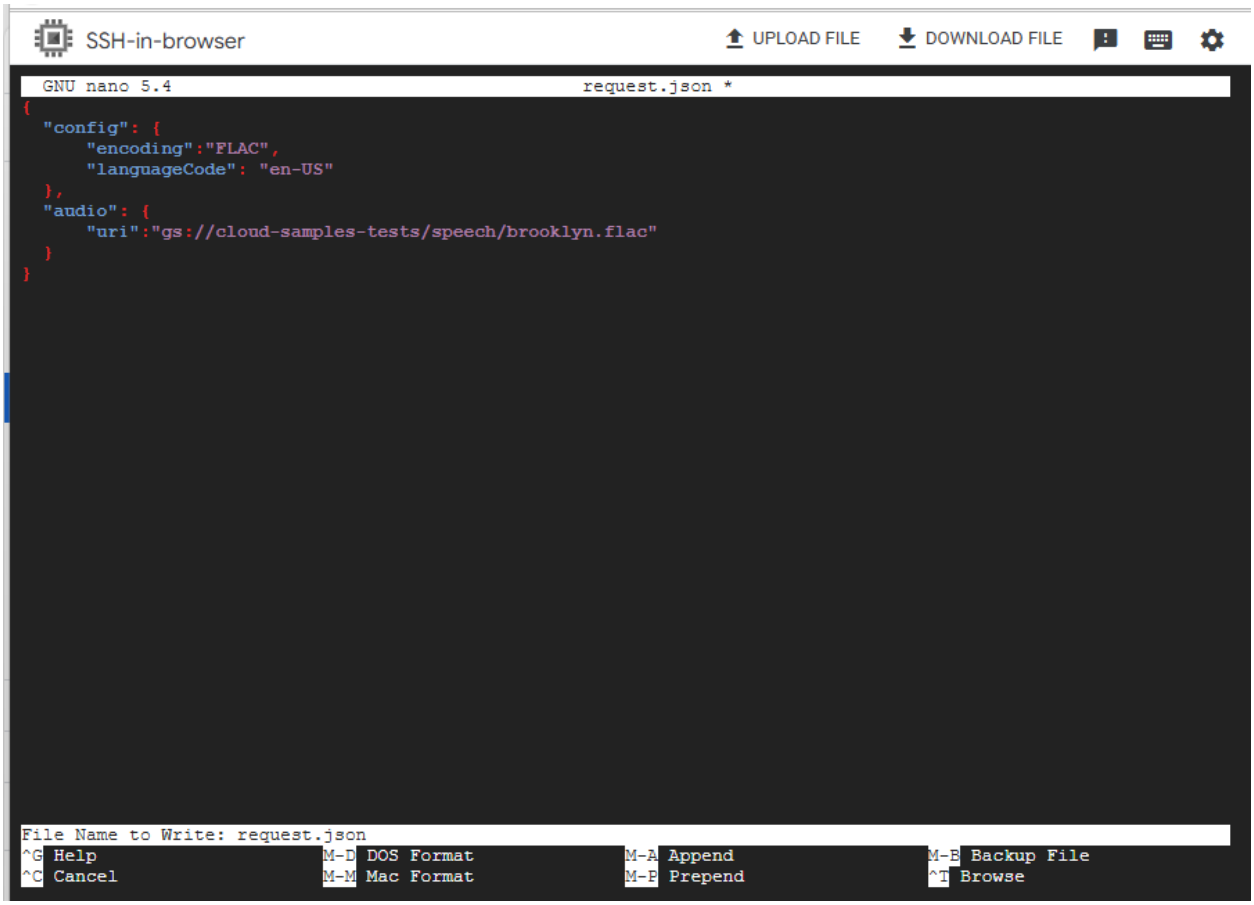
"uri": "gs://cloud-samples-tests/speech/brooklyn.flac"

}

}

Key Metrics:

Field	Value	Significance
`transcript`	"how old is the Brooklyn Bridge"	Accurate transcription of audio.
`confidence`	`0.982` (98.27%)	API is 98.27% confident in the result.



```
student-02-c2655a69aec2@linux-instance:~$ curl -s -X POST -H "Content-Type: application/json" --data-binary @req
uest.json \
"https://speech.googleapis.com/v1/speech:recognize?key=${API_KEY}"
{
  "results": [
    {
      "alternatives": [
        {
          "transcript": "how old is the Brooklyn Bridge",
          "confidence": 0.9311077
        }
      ],
      "resultEndTime": "1.770s",
      "languageCode": "en-us"
    }
  ],
  "totalBilledTime": "2s",
  "requestId": "5652133940788343918"
}
student-02-c2655a69aec2@linux-instance:~$
```

```
student-02-c2655a69aec2@linux-instance:~$ curl -s -X POST -H "Content-Type: application/json" --data-binary @req
uest.json \
"https://speech.googleapis.com/v1/speech:recognize?key=${API_KEY}" > result.json
student-02-c2655a69aec2@linux-instance:~$
```

5. Results & Analysis

✅ **Accuracy**: The API correctly transcribed the audio with **high confidence (98.27%)**.

✅ **Latency**: Synchronous response was near-instantaneous.

✅ **Use Case**: Suitable for applications like voice assistants, call center analytics, and real-time captioning.

6. Key Learnings

1. **API Setup**:
    a. API keys authenticate requests without exposing credentials.
    b. Environment variables enhance security.
2. **Audio Requirements**:
    a. Supported formats include FLAC, WAV, and LINEAR16.
    b. Language codes must be specified (e.g., en-US).
3. **Confidence Scores**:
    a. Values close to 1.0 indicate high accuracy.

7. Conclusion

This lab successfully demonstrated:

- **Speech-to-Text transcription** using Google Cloud's AI.
- **API integration** via curl commands.
- **Practical insights** into audio processing and confidence metrics.

Future Applications:

- **Real-time transcription** for live events.
- **Multilingual support** (e.g., es-ES, fr-FR).