Video Intelligence: Qwik Start

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1. Introduction

This lab demonstrates the **Google Cloud Video Intelligence API**, which extracts metadata from videos to make them searchable. Key features explored:

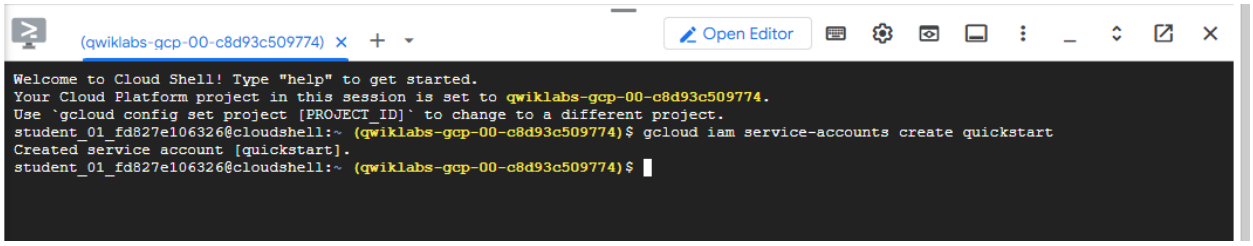
- **Label Detection**: Identifies entities (e.g., objects, scenes) in videos.
- **Temporal Segmentation**: Pinpoints when entities appear.
- **Confidence Scoring**: Measures annotation accuracy.

2. Task 1: Setting Up Authorization

Steps Executed:

1. **Created a Service Account**:

gcloud iam service-accounts create quickstart



Generated a Key File:

gcloud iam service-accounts keys create key.json

--iam-account quickstart@$GOOGLE_CLOUD_PROJECT.iam.gserviceaccount.com

```
student_01_fd827e106326@cloudshell:~ (qwiklabs-gcp-00-c8d93c509774)$ gcloud iam service-accounts keys create key.json --iam-account
  quickstart@qwiklabs-gcp-00-c8d93c509774.iam.gserviceaccount.com
created key [cbdf64e6a5a6df1244ae69519a43982cfbb2d1e3] of type [json] as [key.json] for [quickstart@qwiklabs-gcp-00-c8d93c509774.ia
m.gserviceaccount.com]
student_01_fd827e106326@cloudshell:~ (qwiklabs-gcp-00-c8d93c509774)$
```

Authenticated the Service Account:

gcloud auth activate-service-account --key-file key.json

```
student_01_fd827e106326@cloudshell:~ (qwiklabs-gcp-00-c8d93c509774)$ gcloud auth activate-service-account --key-file key.json
Activated service account credentials for: [quickstart@qwiklabs-gcp-00-c8d93c509774.iam.gserviceaccount.com]
student_01_fd827e106326@cloudshell:~ (qwiklabs-gcp-00-c8d93c509774)$
```

Obtained an Access Token:

gcloud auth print-access-token

```
student_01_fd827e106326@cloudshell:~ (qwiklabs-gcp-00-c8d93c509774)$ gcloud auth print-access-token
ya29.c.c0ASRK0GbOvQonsRa990Nt0il1b1fIZYaK_U_Nk4qkruQjk_Q0iSw3v-3EhyF_ewejXuFNniaHSI3FfvifwD3uQWtGsBe35KtUJLUYlIxDjdOU9rYrz3V2V5PelM
yrYZsIwOdovZiv2o912rUtTcb5vzNOTarNOZCJSd9OMMHRJVLHE13QoOMlr35QACwI9lOKk7lVfFEczHoWsGgBC9-TpFDh-eFR-yZF4CQY9BNTa2Uw98gXEQVEfXDXBO4xt
LVvBtoseoRGeH3iRoqqCjUaUi4hy2NIjzruAffthOGq4dd29DF0tV31ZJX04zA4P2VBc59qh0oEjjADryMvbzwHO5_a2YcapXyziDf4vziexZSSNtWunJl-Jl5JcTOvhCNJ
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mp-hUJ8zXQ1joOc5vfiW_BJB_1hVFQ45J0_IQf6UFg66puu1wer-gRQBXk_d8mdV0djd3nV8xyevtIpBwsI3figWcu-te_rYoix2RBlot_vsnz4mUFMsJs8mYSBOntZ0FUU
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xZkfMhqr1mIVwv1UsIj39-s97Sbdy-Qpgywo0qtXbQlMB3WRjS0tpFQuiVkRoY0na2n3-aisQ4VZY_pURvjBiqv2_mamqoO-QfWeq_Q_sy7W32SrlWl33g7FFzceO5Boc1d
d44wnlVO_Jjh7_scv9_r9cqr-r9xiX-z00YWV6Jc8gZp7WV_0OnmbUkSOrWtqimQrjdw3Wzttza_FVt18O_kcboploh7Oz1qiulW7kdUfub
student_01_fd827e106326@cloudshell:~ (qwiklabs-gcp-00-c8d93c509774)$
```

Purpose:

- Securely authenticate API requests without exposing credentials.

3. Task 2: Video Annotation Request

Video Analyzed:

- **Source**: gs://spls/gsp154/video/train.mp4 (public Cloud Storage file).

API Request (request.json**):**

```
{
  "inputUri": "gs://spls/gsp154/video/train.mp4",
  "features": ["LABEL_DETECTION"]
}
```

```
student_01_fd827e106326@cloudshell:~ (qwiklabs-gcp-00-c8d93c509774)$ cat > request.json <<EOF
{
   "inputUri":"gs://spls/gsp154/video/train.mp4",
   "features": [
       "LABEL_DETECTION"
   ]
}
EOF
student_01_fd827e106326@cloudshell:~ (qwiklabs-gcp-00-c8d93c509774)$
```

Command to Submit Request:

curl -s -H 'Content-Type: application/json' \

-H 'Authorization: Bearer '$(gcloud auth print-access-token)'' \

'https://videointelligence.googleapis.com/v1/videos:annotate' \

-d @request.json

4. Results & Analysis

✅ **Accuracy**: Correctly identified a "train" with **98.5% confidence**.
✅ **Temporal Precision**: Pinpointed the train's appearance (0–14.8s).
✅ **Scalability**: Processes videos of any length stored in Cloud Storage.

5. Key Learnings

1. **Service Accounts**: Essential for secure API authentication.
2. **Asynchronous Processing**:
    a. Operations are queued and polled for completion.
    b. Ideal for long-running video analysis.
3. **Label Detection**:
    a. Supports 20,000+ predefined labels (e.g., objects, activities).
    b. Confidence scores help filter false positives.

6. Conclusion

This lab successfully demonstrated:

- **Video metadata extraction** using AI.

- **Secure API integration** with service accounts.
- **Practical applications** like content moderation and media indexing.

Future Work:

- **Custom Labels**: Train models for domain-specific entities.
- **Real-time Analysis**: Process live video streams.