INDIANA UNIVERSITY

ENGR-E516 Engineering Cloud Computing

Format 360: Multi-Format File Conversion Engine on Google Cloud

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Introduction

- Format 360 harnesses Google Cloud Platform's serverless architecture for an integrated, scalable file conversion service, bridging the market gap with its comprehensive and seamless functionality.

- Format 360 uses GCP’s serverless computing, including Cloud Run and Cloud Functions, to efficiently handle multiple file formats, for cost-effective flexibility.

Motivation

Addressing Market Gaps:

- Existing tools lack seamless integration and comprehensive format support.
- Addresses the need for a unified solution that integrates seamlessly across different platforms, reducing dependency on multiple tools.

Utilizing Advanced Technology:

- Many tools fail to utilize the full potential of cloud computing.
- Format 360 exploits Google Cloud Platform’s serverless infrastructure for improved efficiency and cost-effectiveness.

Related Work and Gap Analysis:

Existing Solutions Limitations:

- **Current tools like Zamzar and CloudConvert lack scalability, integration, and support for multiple formats.**

Identifying Market Deficiencies:

- **Many tools fail to integrate into broader tech ecosystems, highlighting the need for a cohesive and adaptable tool like Format 360.**

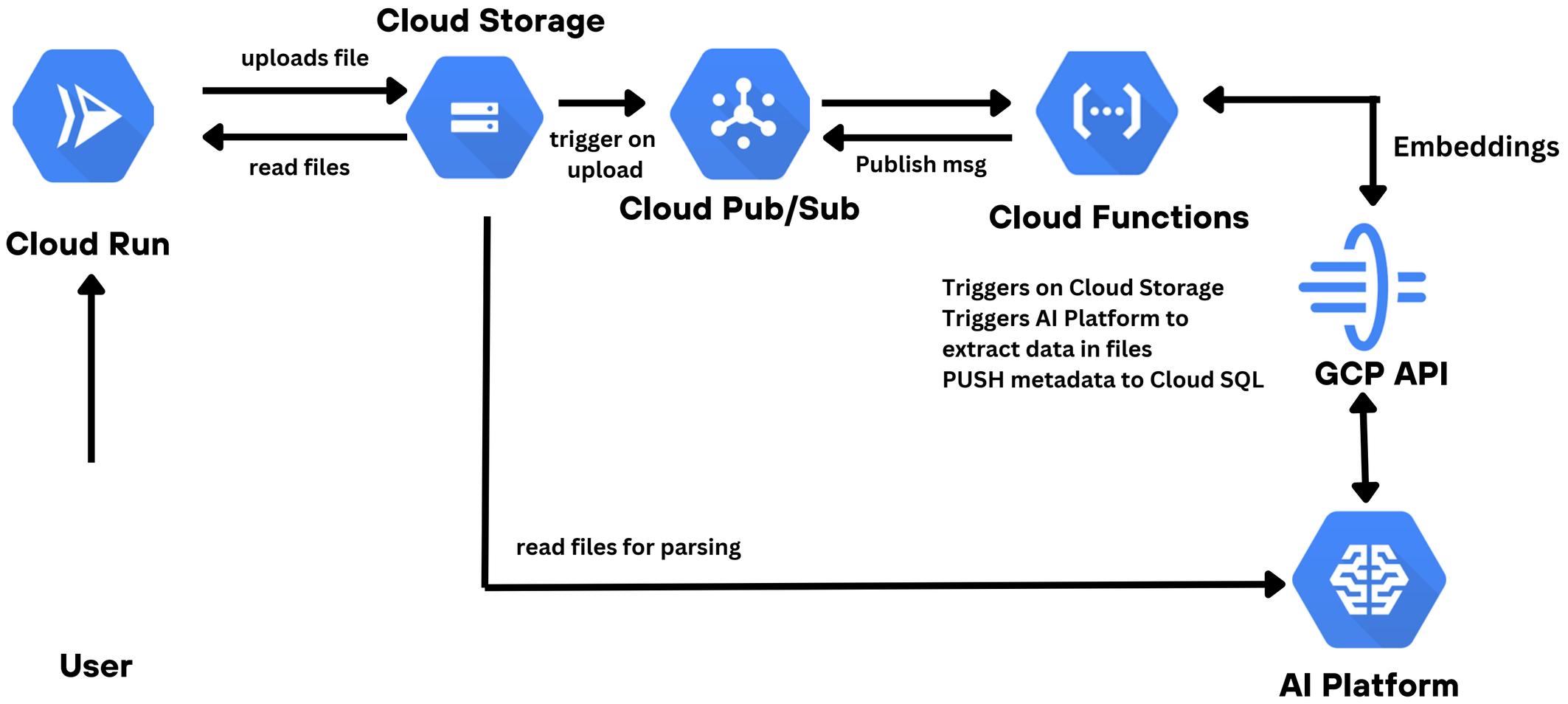
Technological Superiority:

- **Utilizes Google Cloud's serverless computing to enhance scalability, maintain cost-effectiveness, and ensure high performance under diverse conditions.**

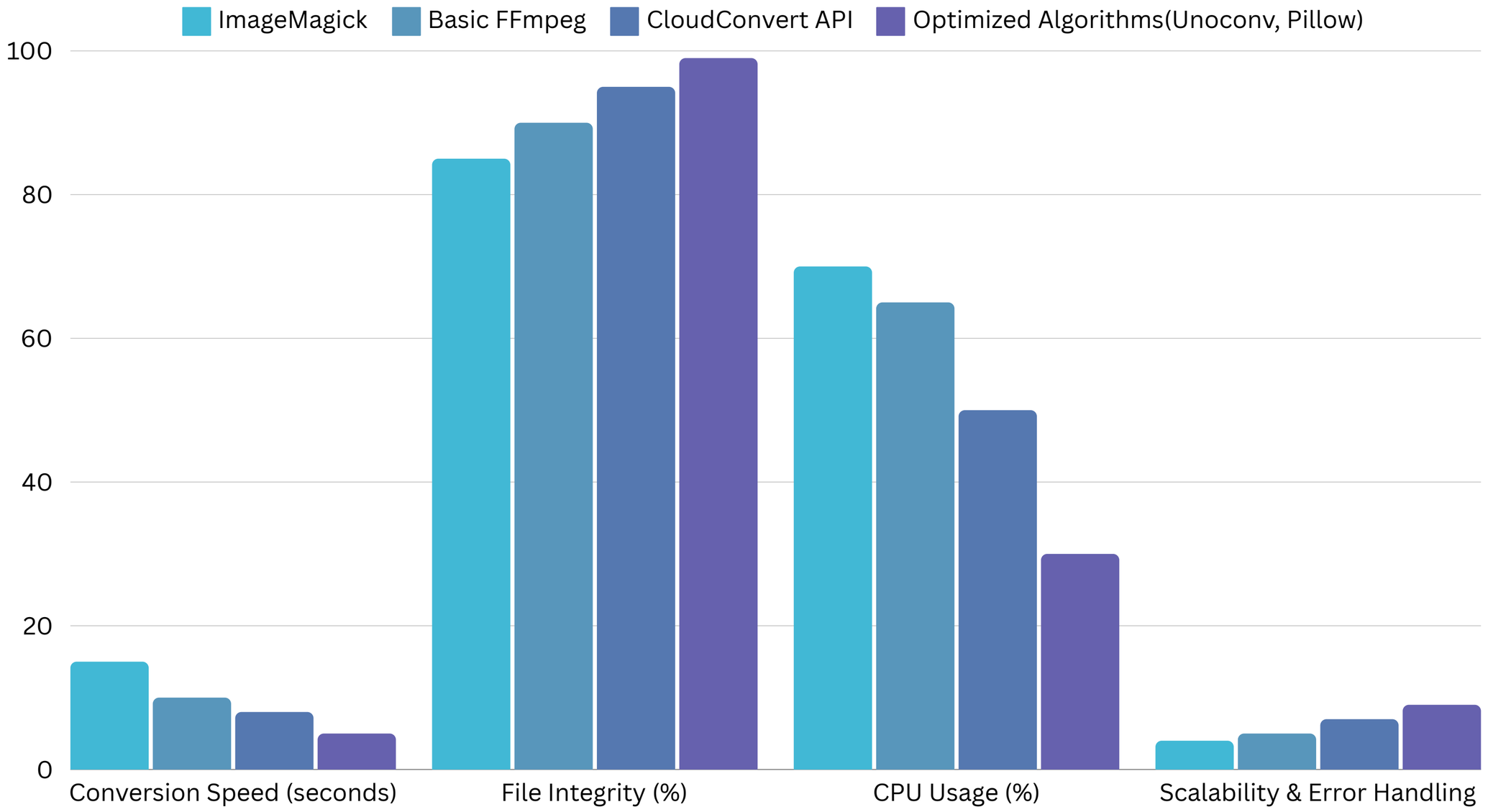
Achieved Result

- **Scalable architecture that can accommodate an increase in conversion demands without compromising service quality.**
- **We utilized Google Cloud Platform's comprehensive infrastructure for Format 360, including Cloud Run, Cloud Functions, Cloud Storage, and Cloud Pub/Sub.**
- **Additionally, Docker containerized the application, ensuring consistency across development, testing, and production environments.**

ARCHITECTURE FOR FORMAT 360

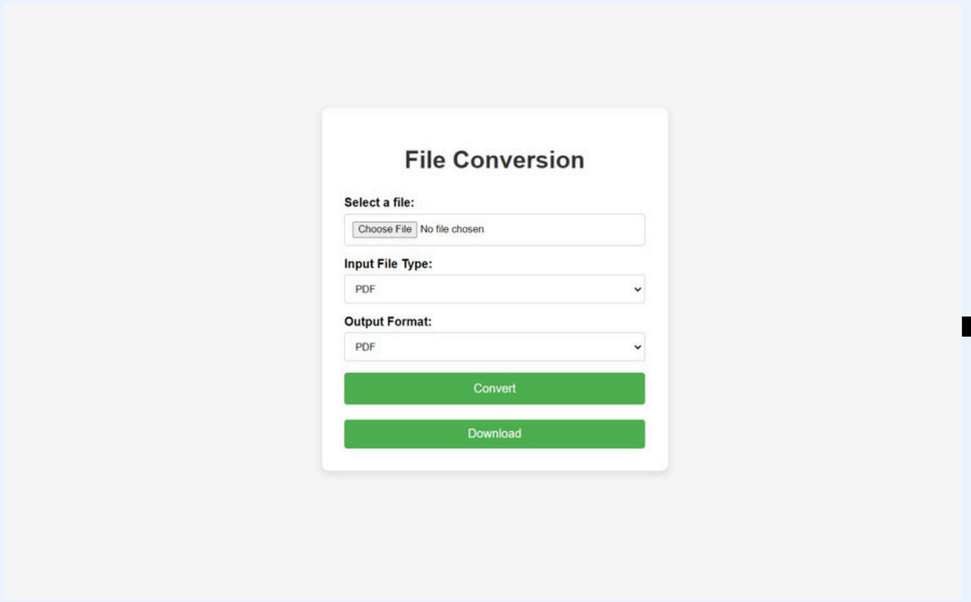


Comaprison :

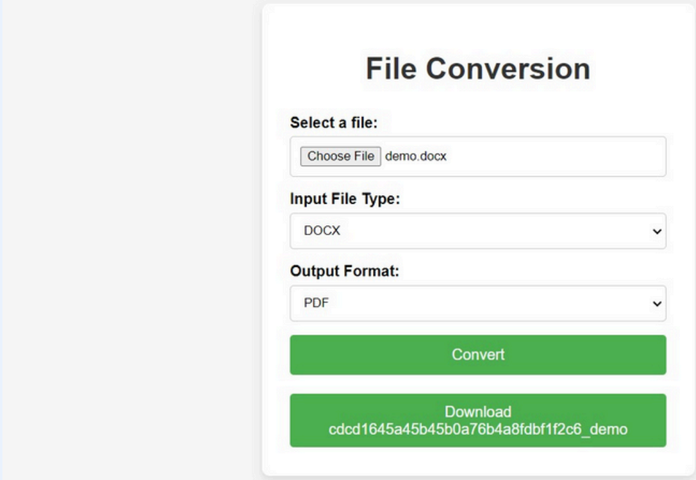

ImageMagick
Basic FFmpeg
CloudConvert API
Optimized Algorithms(Unoconv, Pillow)
100
80
60
40
20
0
Conversion Speed (seconds)
File Integrity (%)
CPU Usage (%)
Scalability & Error Handling

DEMO TIME!

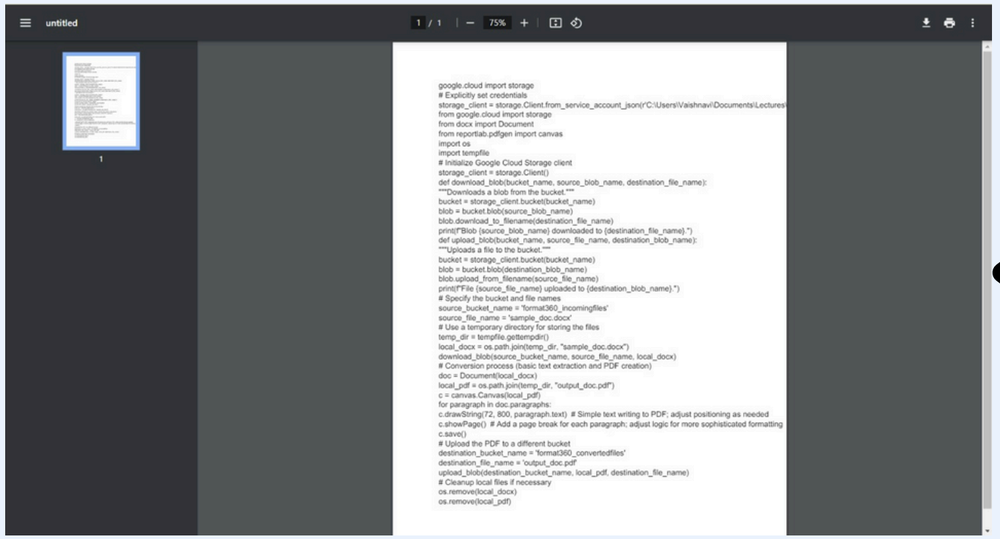
RESULTS:



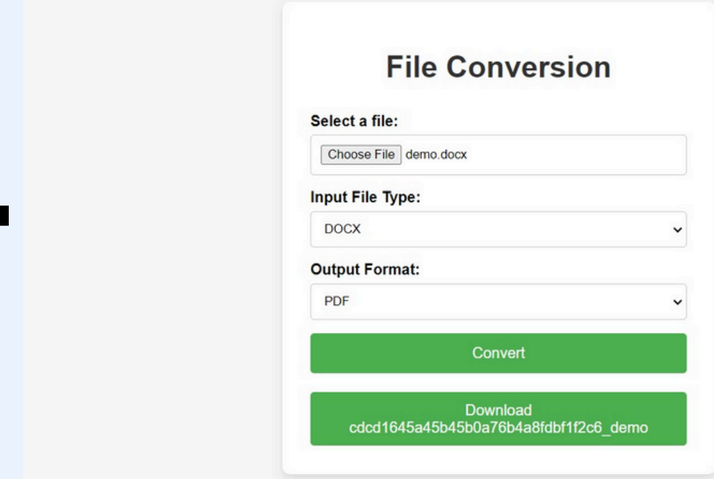
Main Page - Upload the File to Convert



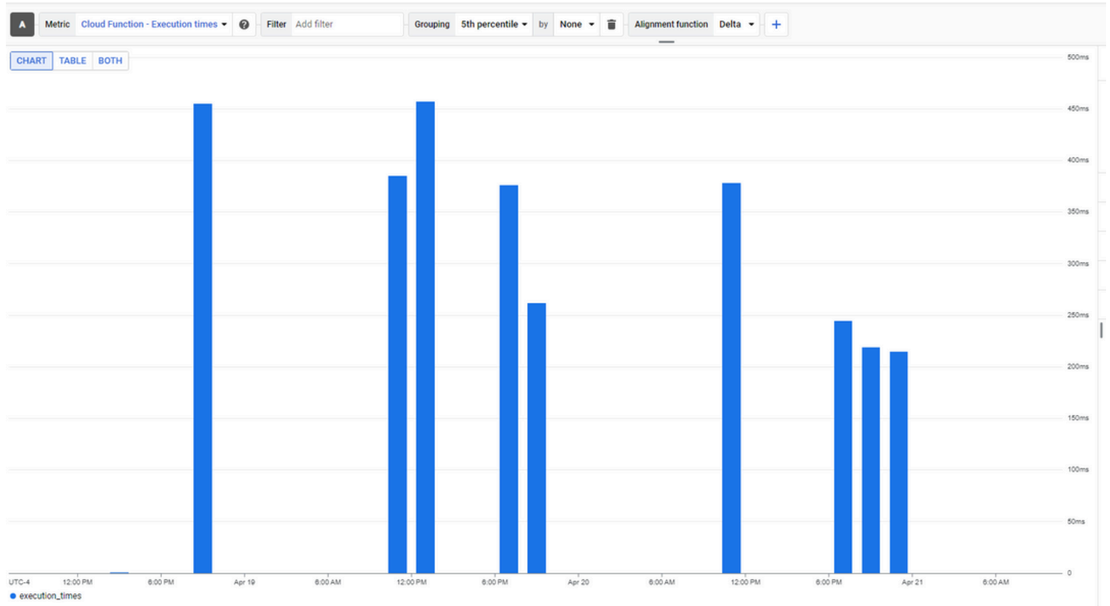
Main Page - Select the conversion Type & Convert



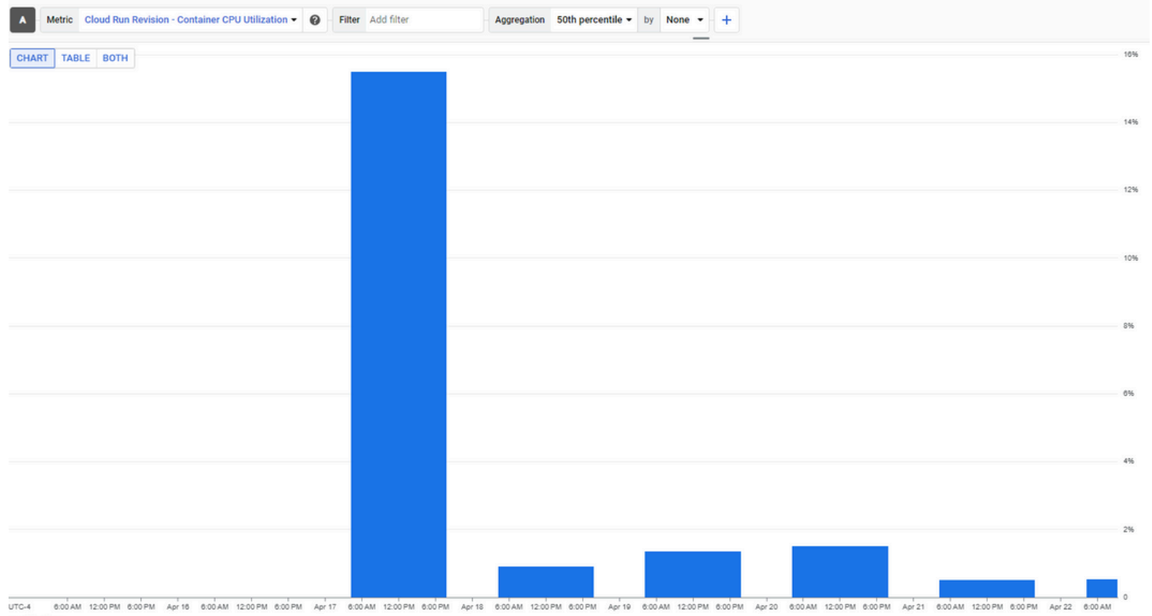
Download Preview & Download the file



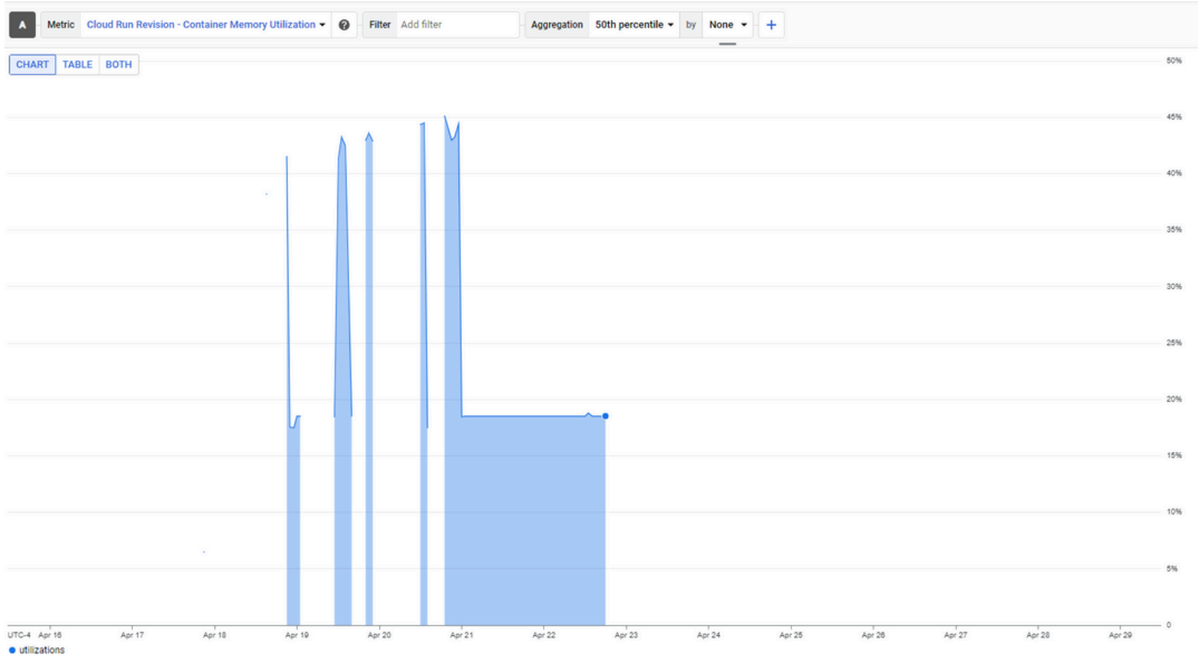
Main Page - Download the file



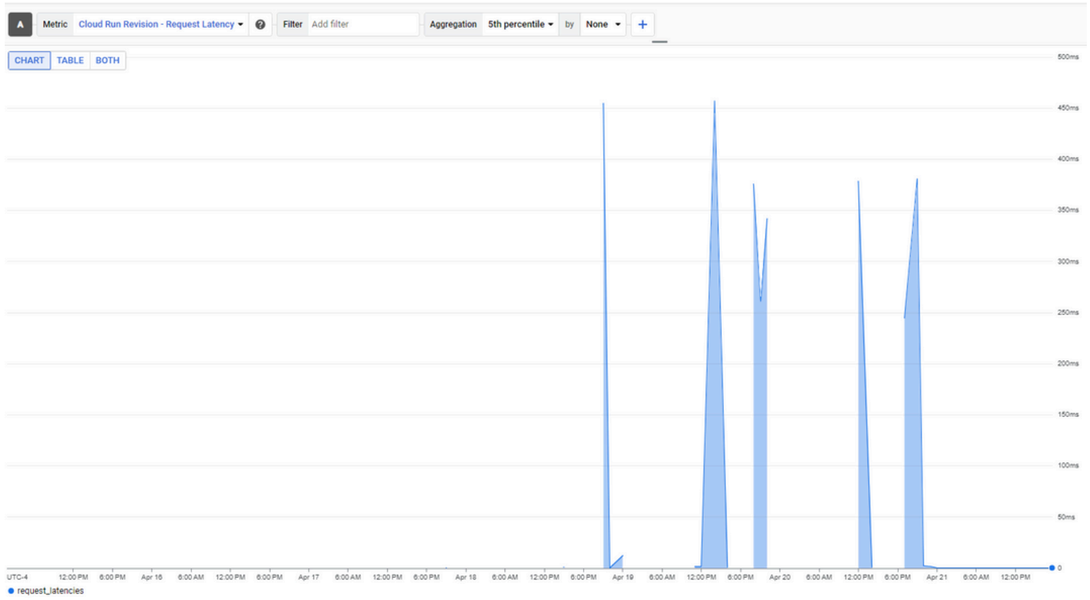
Cloud Function - Execution Time



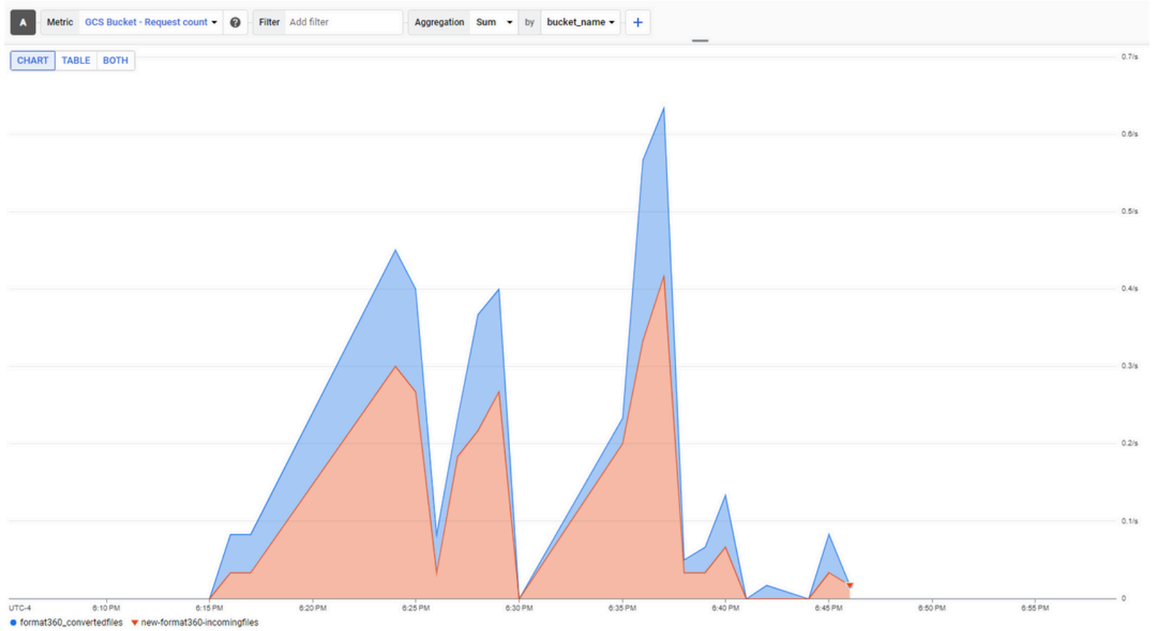
Cloud Run - Container CPU Utilization



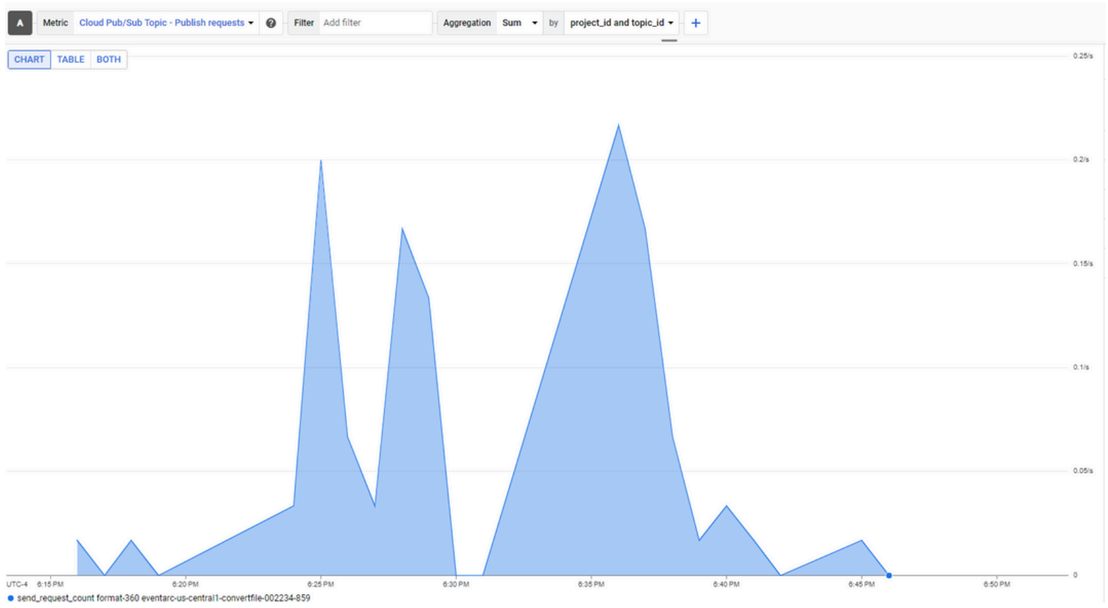
Cloud Run - Container Memory Utilization



Request Latency



Bucket - Request Count

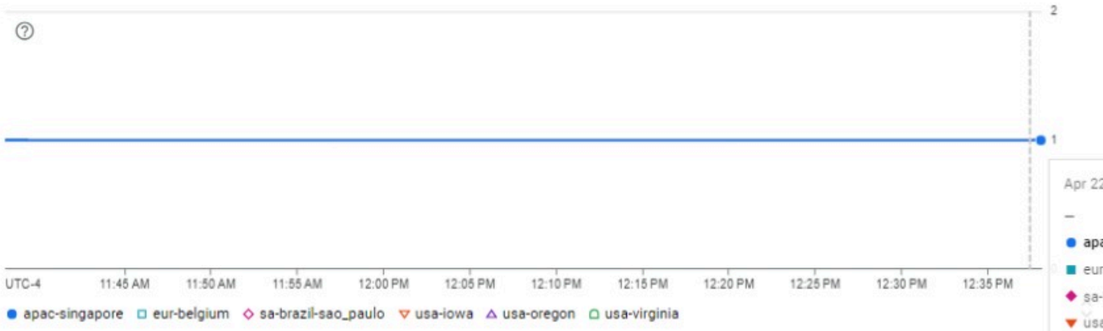


Cloud Pub/Sub - Publish Message Count

format360-uptime

Percent Uptime	Uptime Latency
100%	133.781 ms

Passed Checks

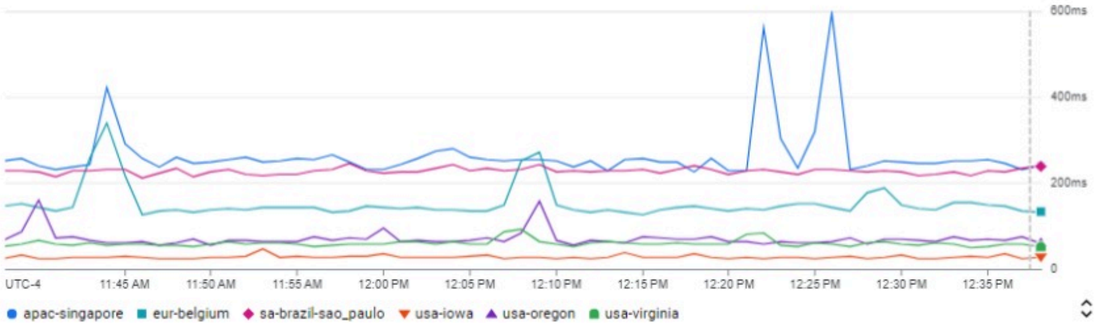


Apr 22, 2024, 12:38:00 PM

apac-singapore	1
eur-belgium	1
sa-brazil-sao_paulo	1
usa-iowa	1
usa-oregon	1

1 below

Uptime Check Latency



Current Status

North America	usa-virginia
	usa-oregon
	usa-iowa
Europe	eur-belgium
Asia Pacific	apac-singapore
South America	sa-brazil-sao_paulo

Configuration

	format360-uptime-7tIJU4uW8XQ
Title	format360-uptime
Check Type	HTTPS
Hostname	dockerrunformat360service-rzzp4fxgbq-uc.a.run.app
SSL Validation	Enabled
Path	/
Port	443
Check Every	60s
Timeout	10s
Regions	Global

Alert Policies

+ CREATE POLICY

Name
format360-uptime uptime failure

Uptime Check Latency

Scope for future development

1. Enhanced Conversion Capabilities:

- **Expand the range of supported file formats, including specialized formats used in industries like healthcare or engineering.**

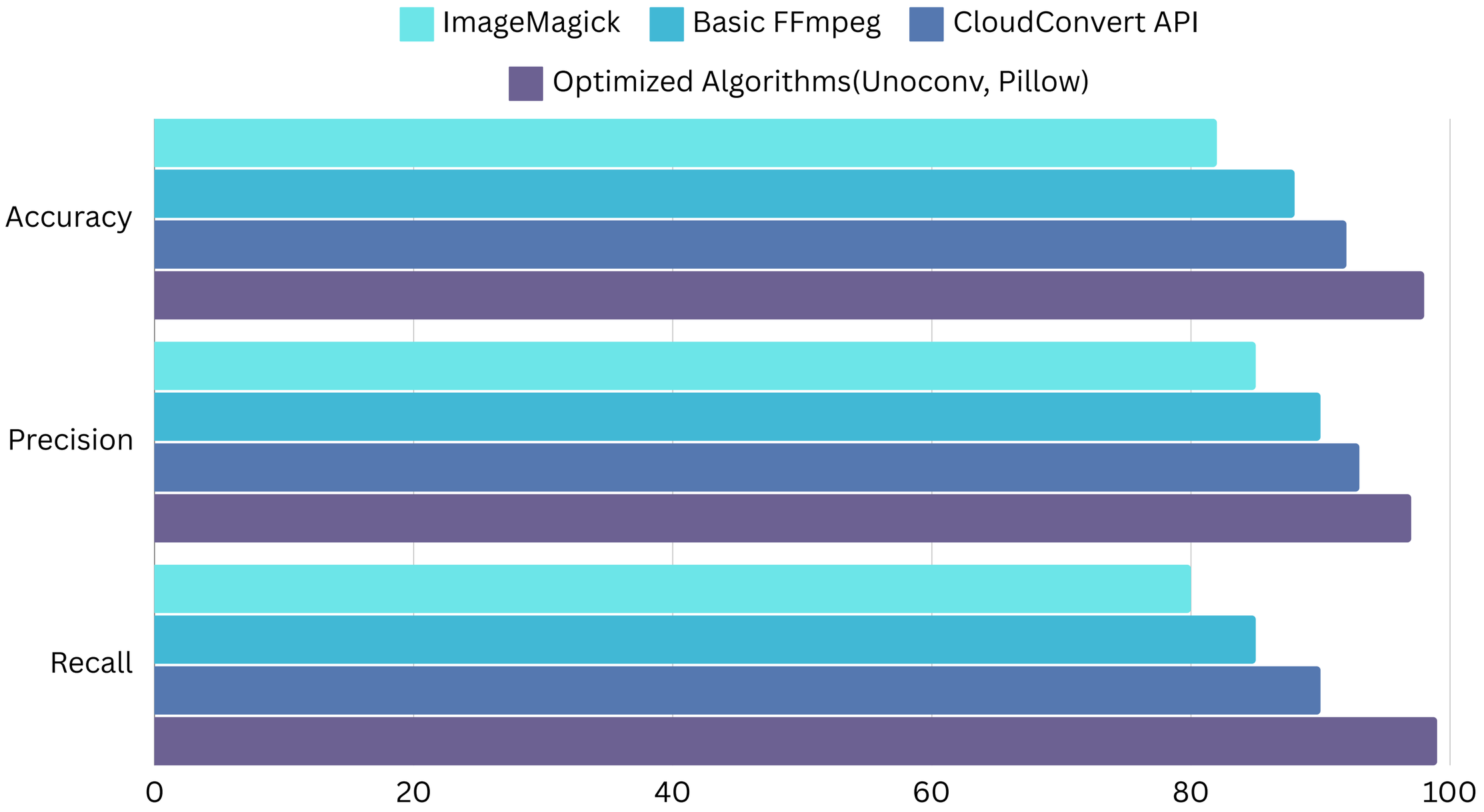
2. Integration with Additional Cloud Services:

- **Provide tighter integration with other GCP services, such as AI Platform for implementing machine learning-enhanced features.**

3. Security Features:

- **Integrate more advanced security measures such as anomaly detection to protect against new and emerging threats.**

Thank you


ImageMagick
Basic FFmpeg
CloudConvert API
Optimized Algorithms(Unoconv, Pillow)
Accuracy
Precision
Recall
0
20
40
60
80
100