Lecture 13: Cloud Functions and Cloud Runs

AC215

Pavlos Protopapas
SEAS/Harvard

Announcements

- Midterm Presentations - 10/31

  Schedule and Location

  (No late days)

- Modal Labs

  Form due 10/23 Wed

  Guest Lecture 10/24 Thu

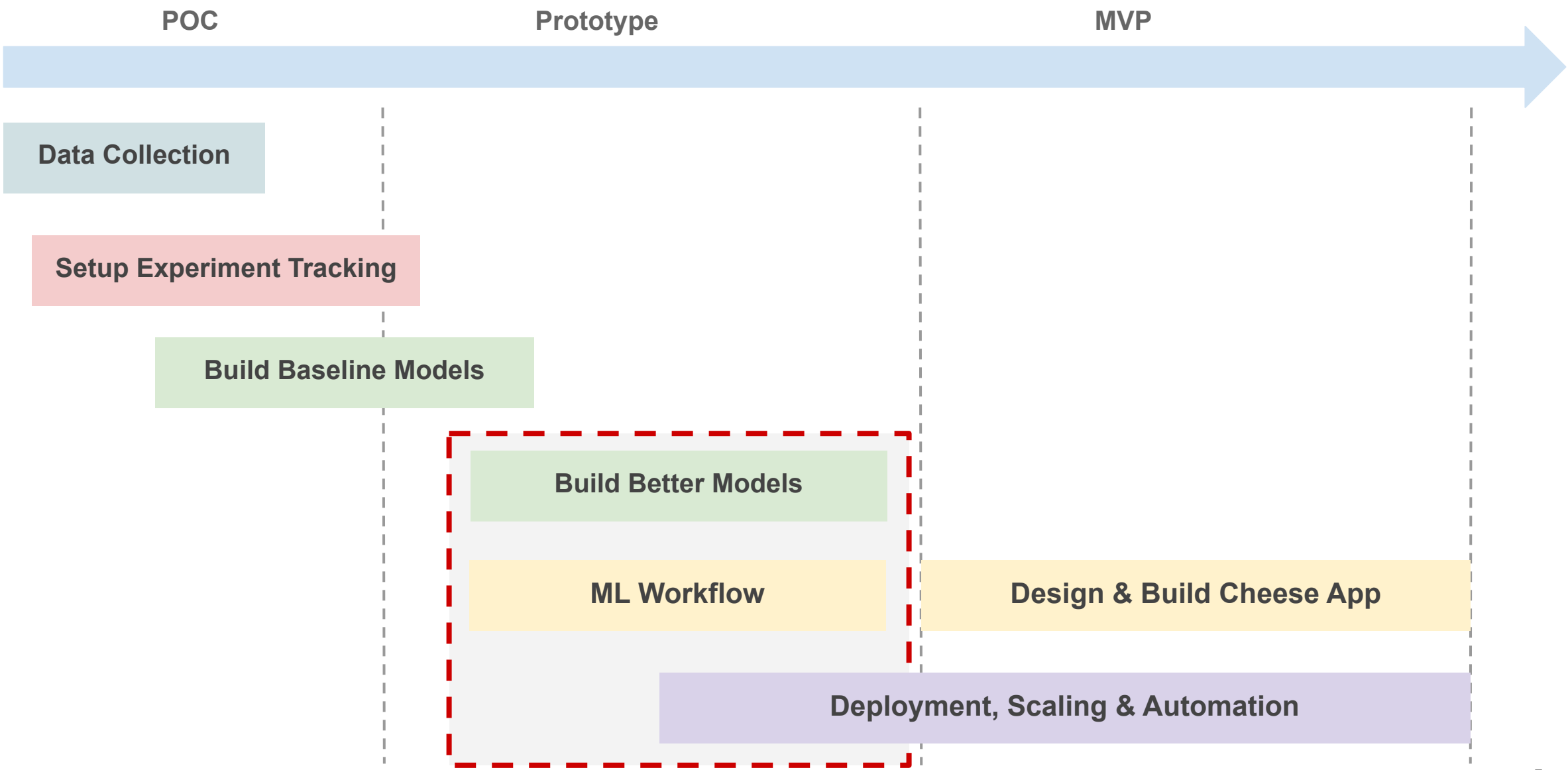
Outline

1. Recap
2. Serverless: Cloud Functions
3. Serverless: Cloud Runs

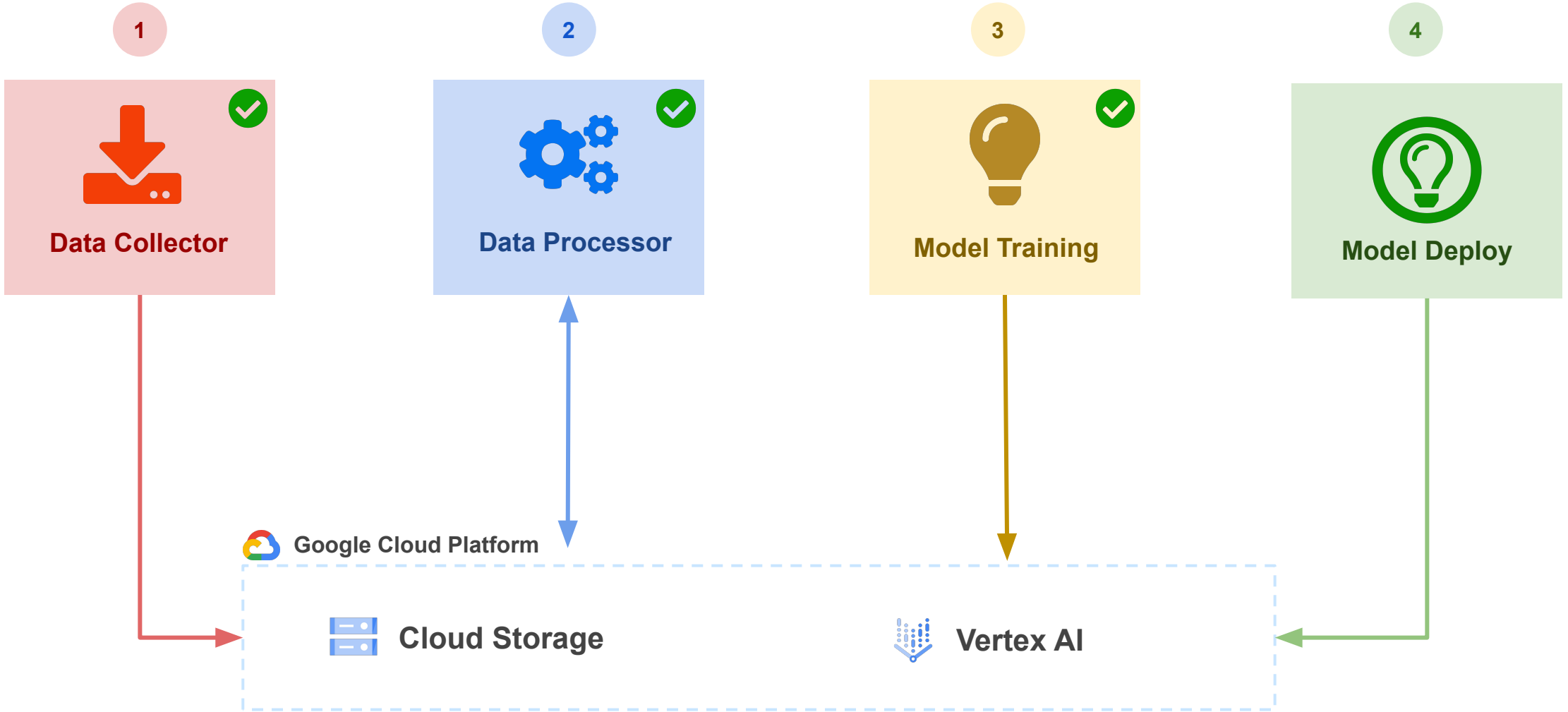
Outline

1. **Recap**
2. Serverless: Cloud Functions
3. Serverless: Cloud Runs

Recap: Cheese App Status



Cheese App Development



Outline

1. Recap
2. **Serverless: Cloud Functions**
3. Serverless: Cloud Run

Serverless

What is serverless?

- Execute code on an as-need basis
- No setup of servers required
- Access GPU hardware only for the “training” step in a pipeline
- Brings down code execution cost

Serverless

Types of serverless:

- Cloud Function
- Cloud Run
- Training Job (Vertex AI)
- Model Deployment (Vertex AI)
- Pipeline (Vertex AI)

} TODAY

} LAST WEEK

} NEXT WEEK

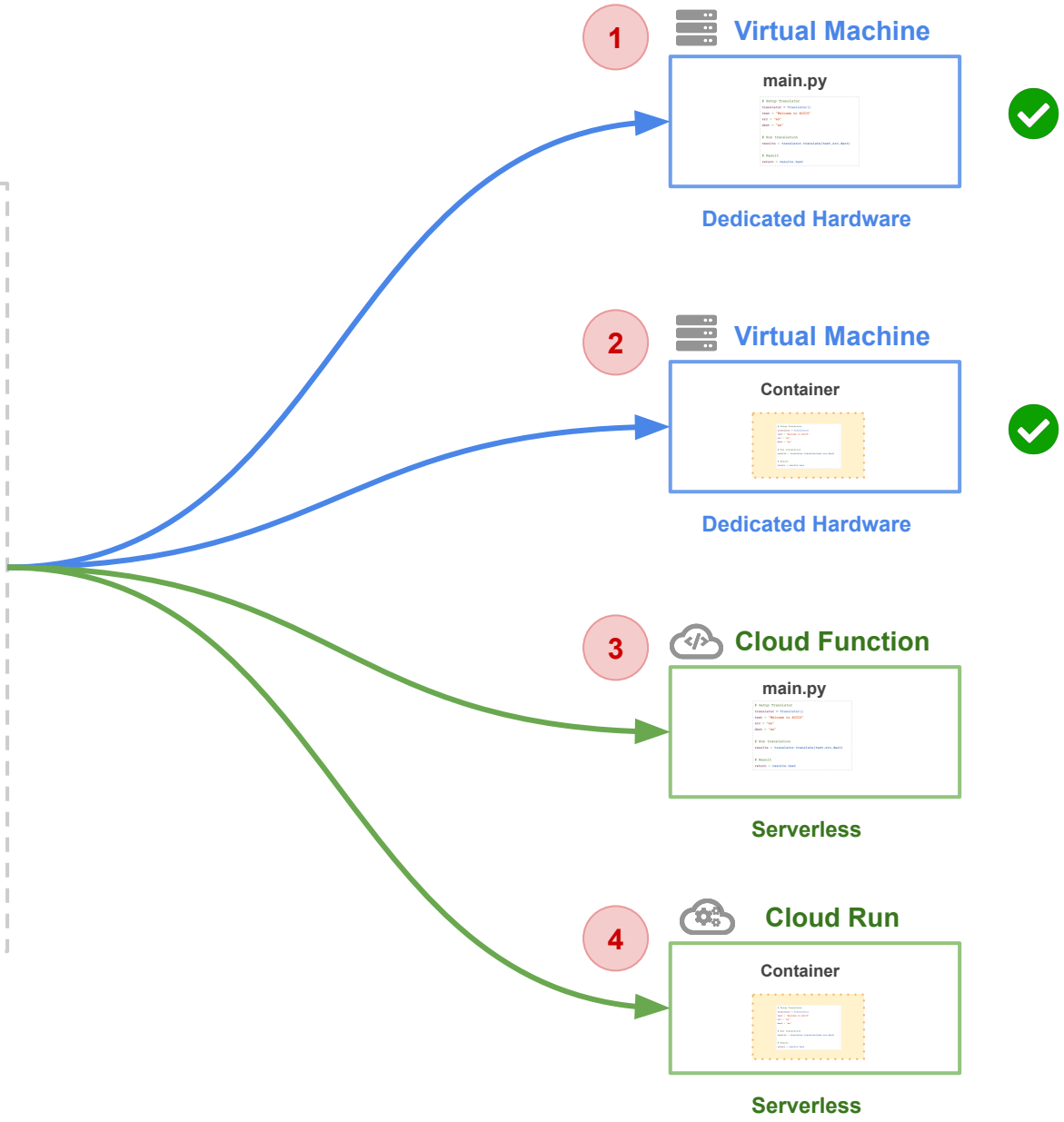
Deployment Options

Simple Translate App

```
# Setup Translator
translator = Translator()
text = "Welcome to AC215. Everyone knows the
moon's made of cheese"
src = "en"
dest = "es"

# Run translation
results = translator.translate(text,src,dest)

# Result
return = results.text
```



Cloud Function

What is a cloud function?

- Run your code in GCP with no servers or containers.
- Pay only for function execution time.
- Scale out easily

Tutorial: Cloud Function

Steps to deploy an app as a **Cloud Function**

- Go to https://console.cloud.google.com/functions.
- Enable GCP APIs.
- Create a python code file.
- Deploy code as Cloud Function.
- For detailed instructions, please refer to the following link
  - Running App as Cloud Function.
    (https://github.com/dlops-io/serverless-deployment#running-app-as-cloud-function)

Outline

1. Recap
2. Serverless: Cloud Functions
3. **Serverless: Cloud Run**

Cloud Run

What is cloud run?

- Run your containerized apps with no servers.
- Run containers as **service** or **job**.
- Only pay when your code is running
- Scale out easily

Tutorial: Cloud Run

Steps to deploy an app in **Cloud Run**

- Go to https://console.cloud.google.com/run.
- Enable GCP APIs.
- Deploy Docker Image in Cloud Run.
- For detailed instructions, please refer to the following link
  - Running App in Cloud Run.
    (https://github.com/dlops-io/serverless-deployment#running-app-in-cloud-run)

Cons of Serverless Architectures

While serverless computing offers numerous benefits, there are some downsides to consider.

- **Vendor lock-in**: Migrating serverless functions between different cloud providers can be challenging due to variations in their implementations and APIs.
- **Cold starts**: When a serverless function remains inactive for a period, it can experience a "cold start," leading to a delay in its initial execution as the platform allocates resources and initializes the function.
- **Limited control and debugging**: Debugging and troubleshooting serverless applications can be complex due to the distributed nature of the execution environment and the limited control over the underlying infrastructure.


THANK YOU!!!