

AWS re:Invent

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Accelerate software development lifecycles with GitOps

Sheetal Joshi

Senior Developer Advocate
AWS

Islam Mahgoub

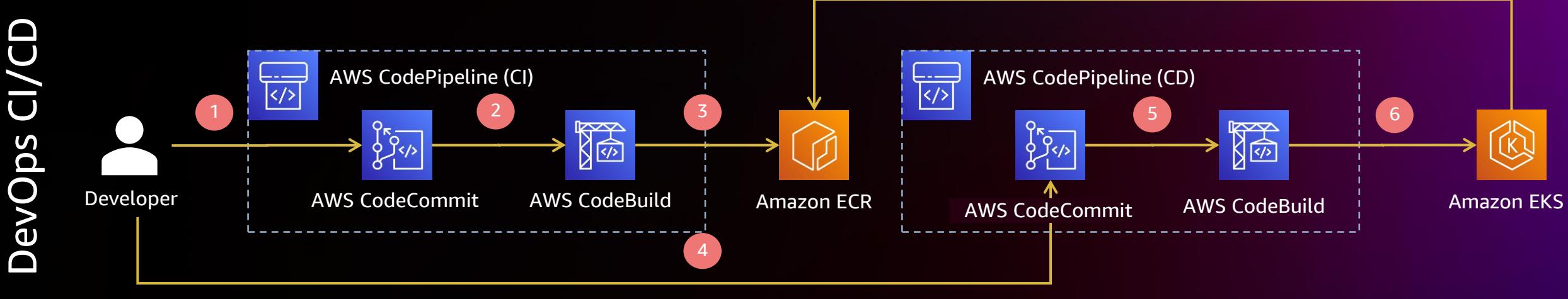
Solutions Architect
AWS

Agenda

- Introduction and concepts
- Multi-cluster GitOps
- Lab time

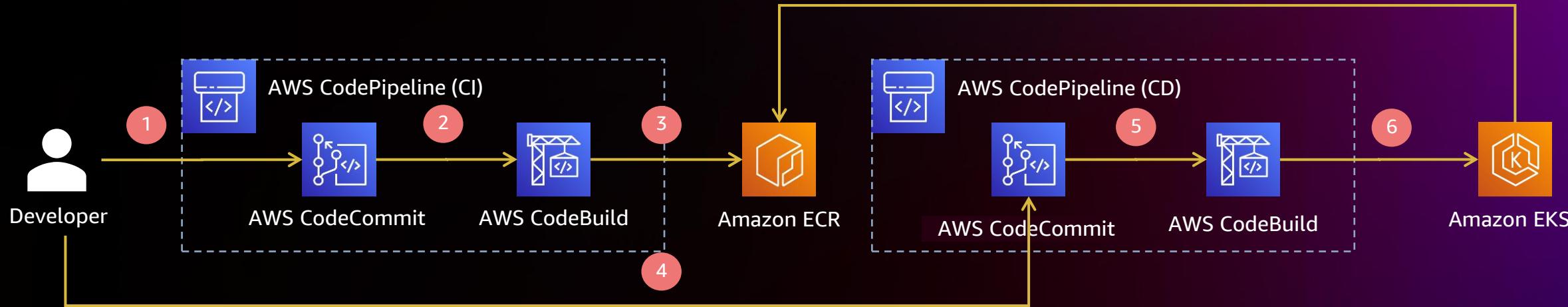
Introduction and concepts

DevOps CI/CD vs. GitOps

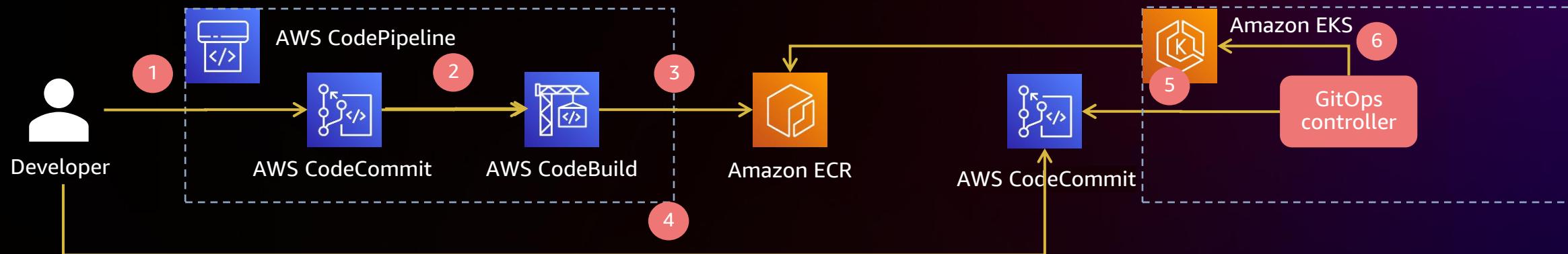


DevOps CI/CD vs. GitOps

DevOps CI/CD



GitOps



Flux, the GitOps controller for Kubernetes



Implemented as a set of Kubernetes extensions

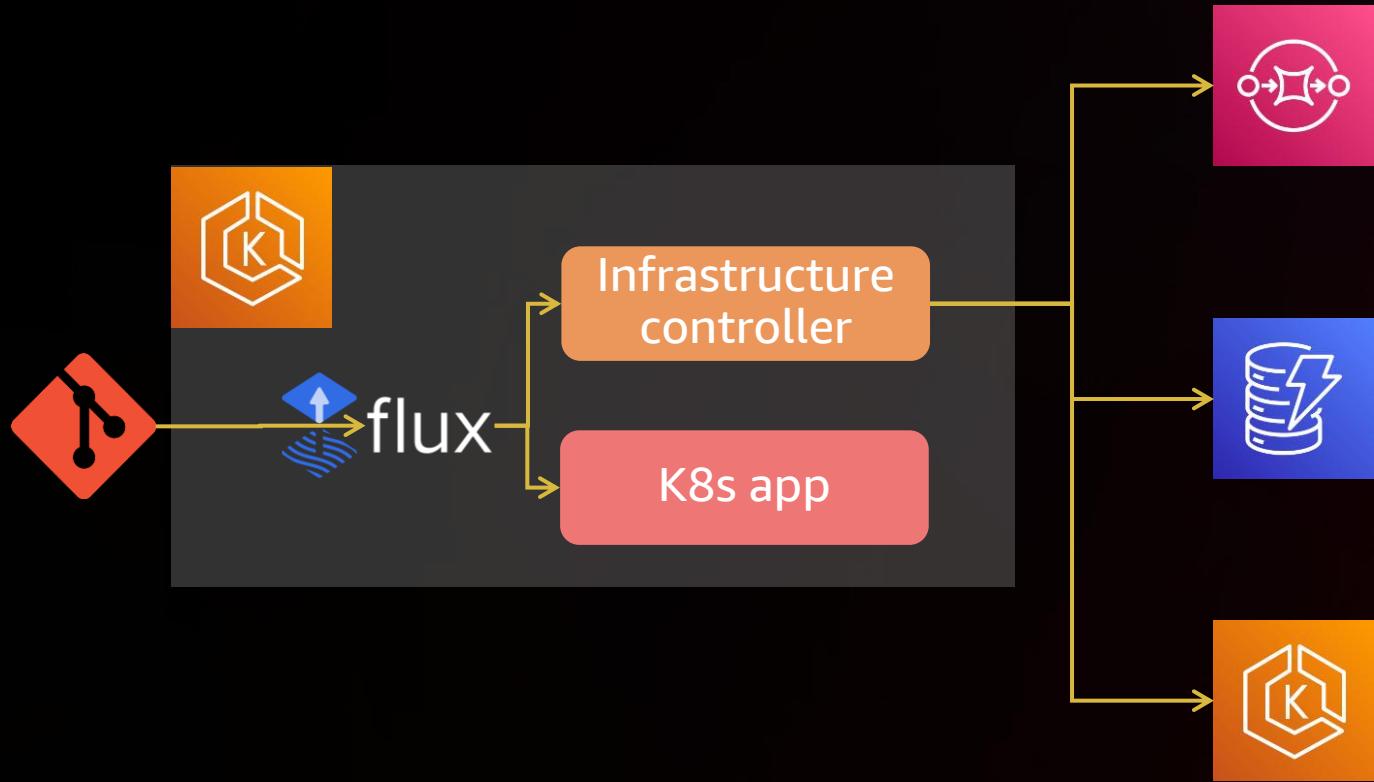


Runs as an in-cluster software agent



Amazon EKS add-on for GitOps
(coming soon)

Infrastructure controllers



e.g., AWS Controller for Kubernetes (ACK), [Crossplane](#)

Sample manifest

```
apiVersion: dynamodb.aws.crossplane.io/v1alpha1
kind: Table
metadata:
  name: products
spec:
  forProvider:
    region: us-west-2
    attributeDefinitions:
      - attributeName: id
        attributeType: S
    keySchema:
      - attributeName: id
        keyType: HASH
    billingMode: PROVISIONED
    provisionedThroughput:
      readCapacityUnits: 1
      writeCapacityUnits: 1
  providerConfigRef:
    name: default
```

Secrets management – What are secrets?

“A Secret is an object that contains a small amount of sensitive data such as a password, a token, or a key.”

– from [Kubernetes.io](https://kubernetes.io/docs/concepts/configuration/secret/)

Secrets management strategies

Externalize secrets

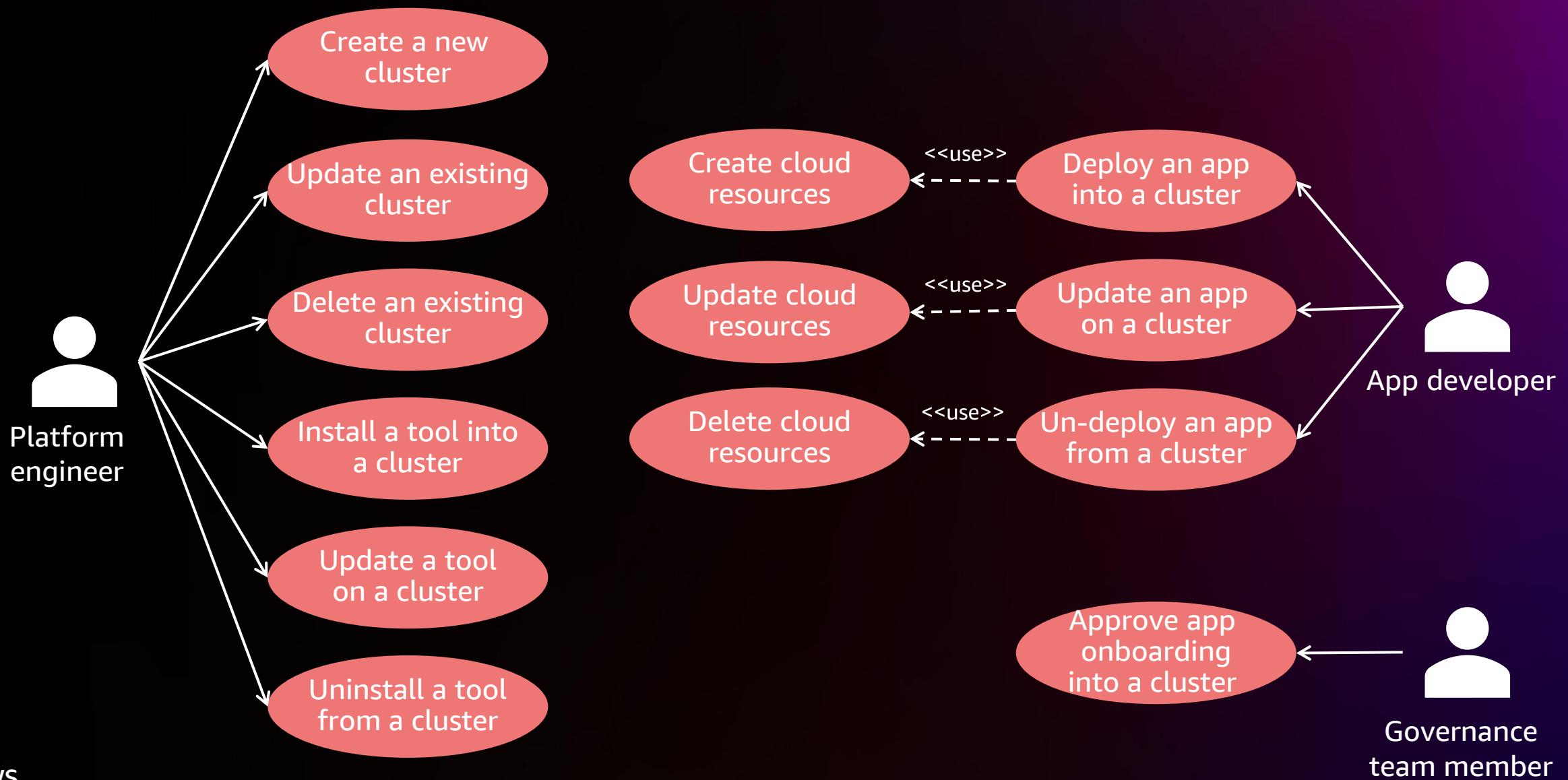
- Secret information stored in an external vault
- e.g., External Secrets Operator

Store secret in Git encrypted

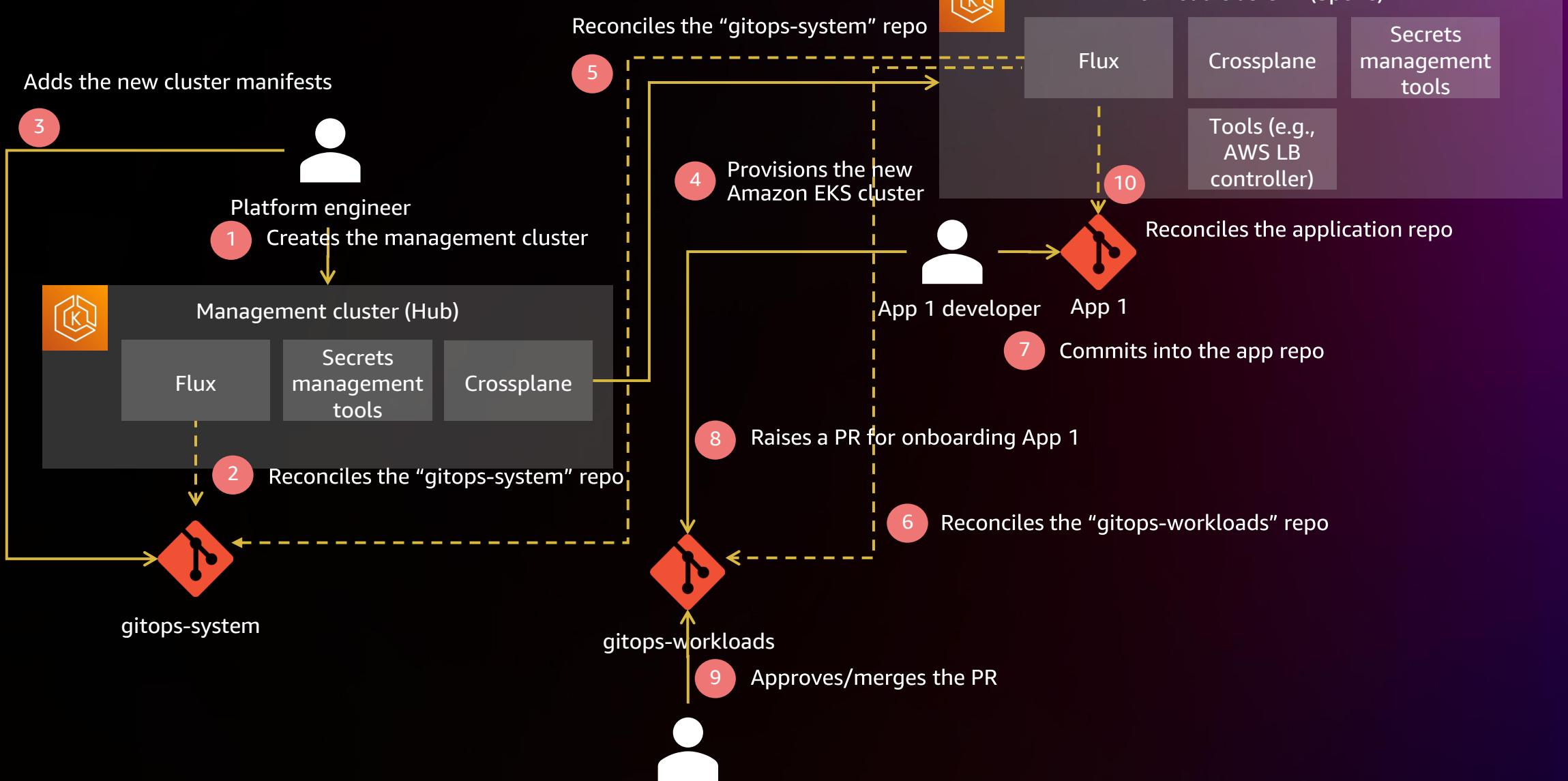
- Secret information stored in Git, but in an encrypted form
- e.g., Sealed Secrets

**Now, let's put all these pieces
together to address a real scenario**

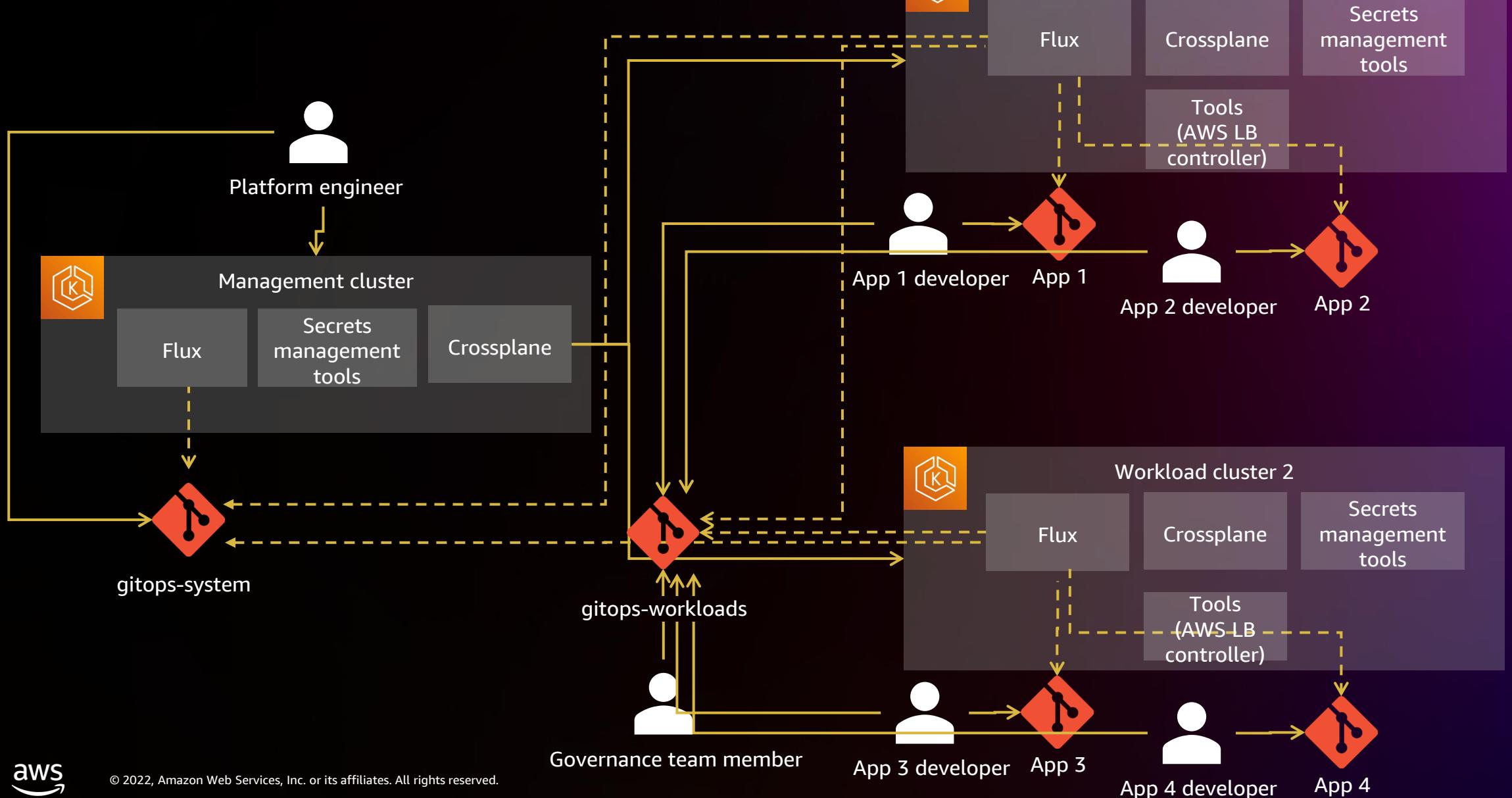
Use cases



Solution



Multi-cluster GitOps



Lab time

Lab structure

- ~~Introduction~~
- ~~Build sequence~~
- Lab 1: Workshop setup
- Lab 2: Build a workload cluster
- Lab 3: Deploy an application into a workload cluster
- Lab 4: Manage workload clusters
- Conclusion

Access lab environment

1

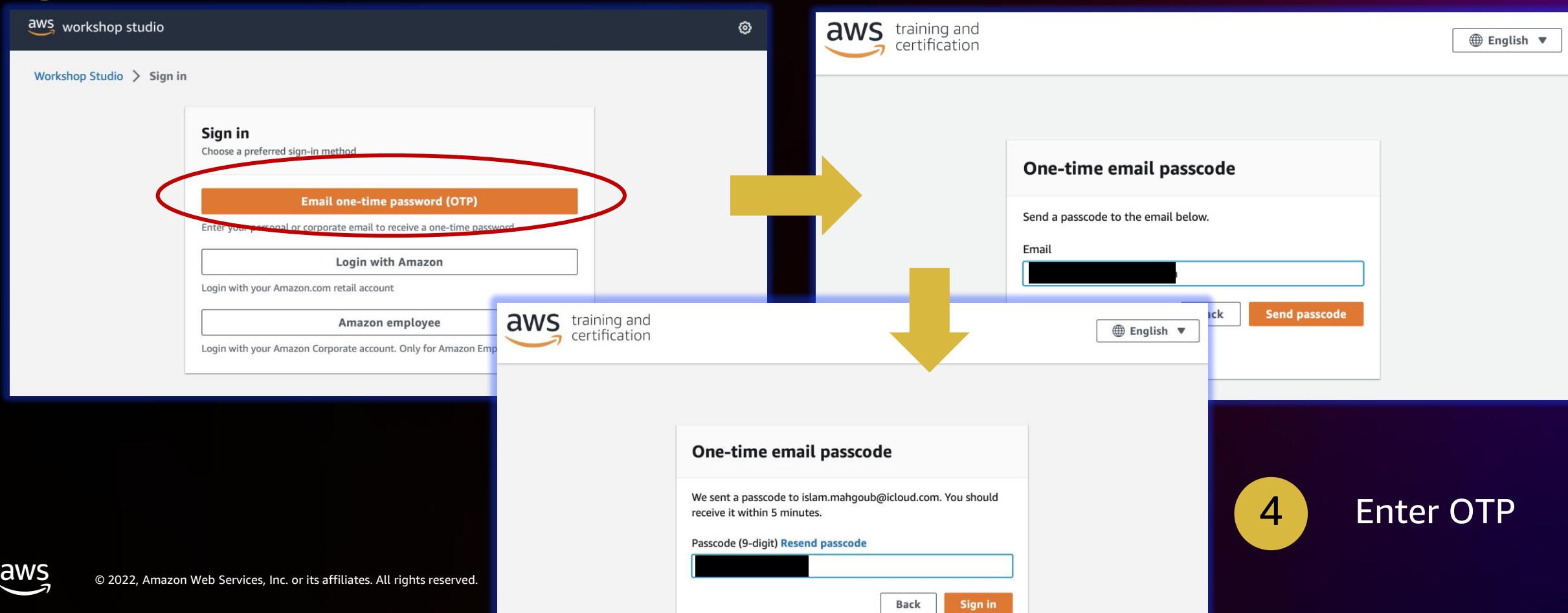
Visit <https://catalog.workshops.aws/join>
(recommended browser: **Chrome**)

2

Choose **Email one-time password (OTP)**

3

Enter your email address



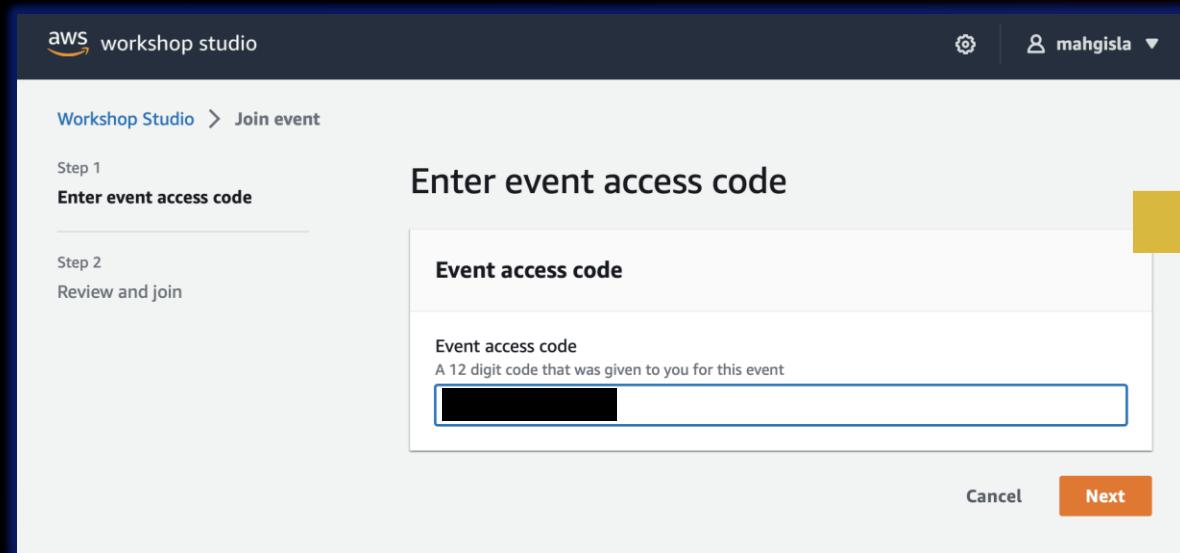
4

Enter OTP

Access lab environment

5

Enter access code: **142b-0aea4a-0a**



aws workshop studio

Workshop Studio > Join event

Step 1 Enter event access code

Step 2 Review and join

Enter event access code

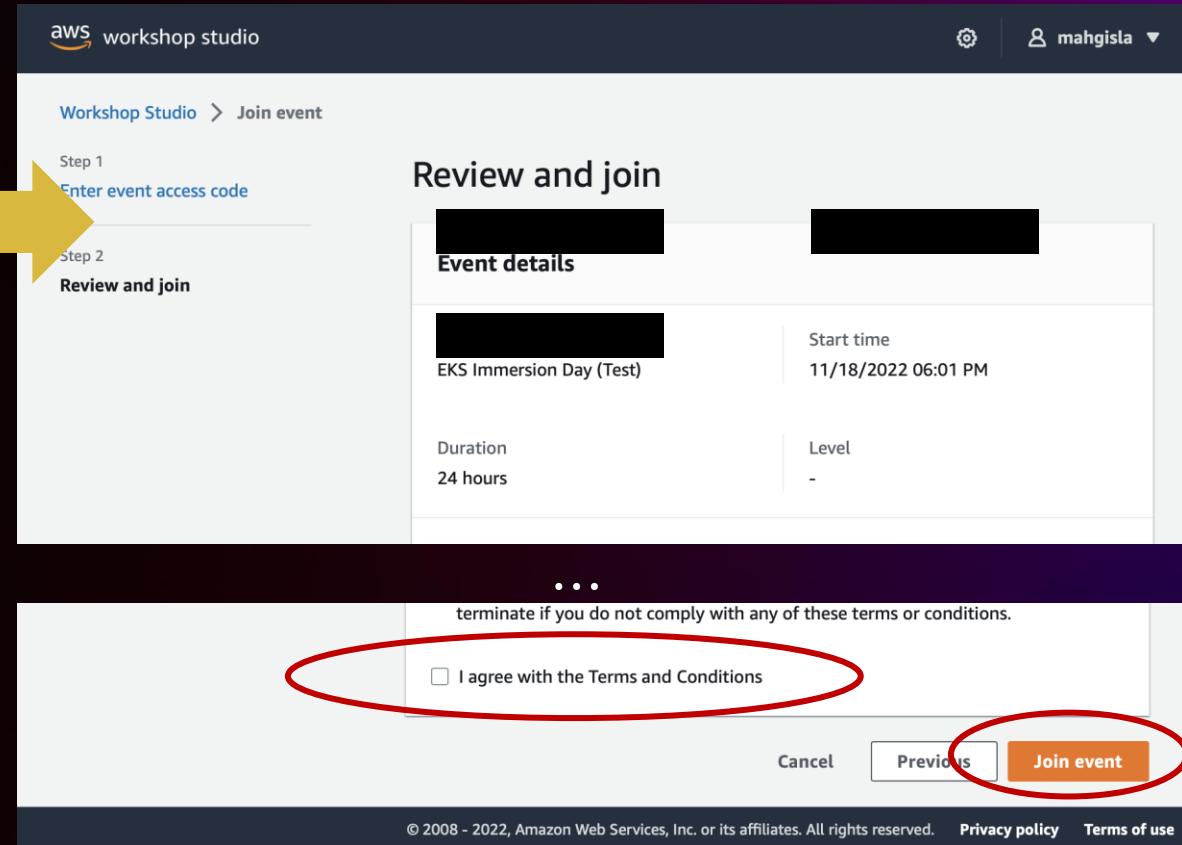
Event access code

Event access code
A 12 digit code that was given to you for this event

Cancel Next

6

Review terms and conditions, select the checkbox, and then select **Join event**



aws workshop studio

Workshop Studio > Join event

Step 1 Enter event access code

Step 2 Review and join

Review and join

Event details

EKS Immersion Day (Test)

Start time
11/18/2022 06:01 PM

Duration
24 hours

Level
-

...
terminate if you do not comply with any of these terms or conditions.

I agree with the Terms and Conditions

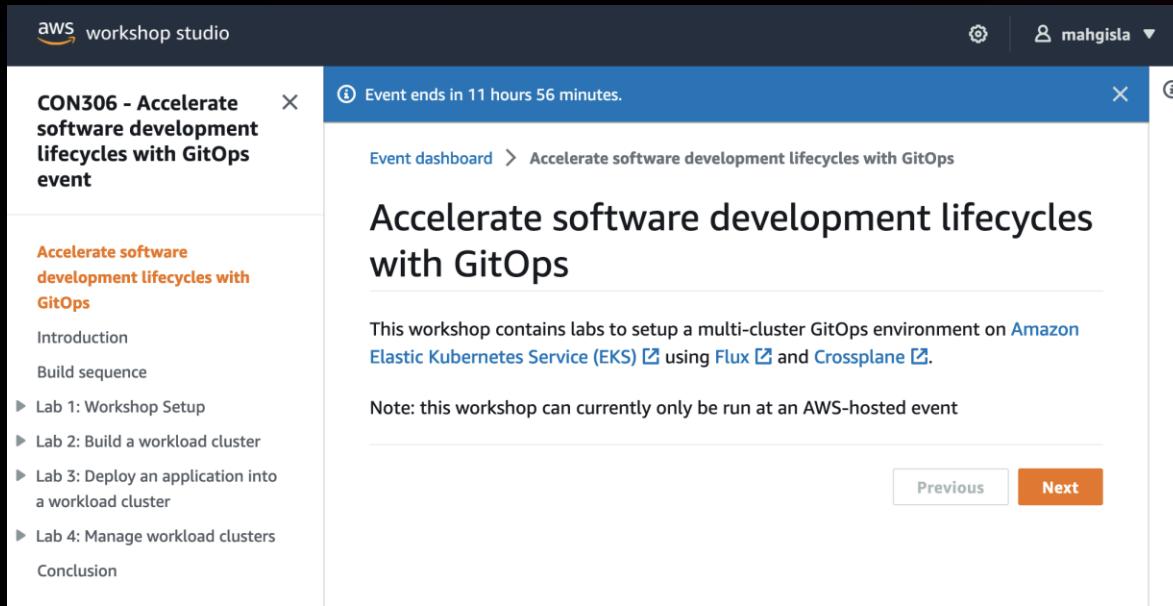
Cancel Previous Join event

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Access lab environment

7

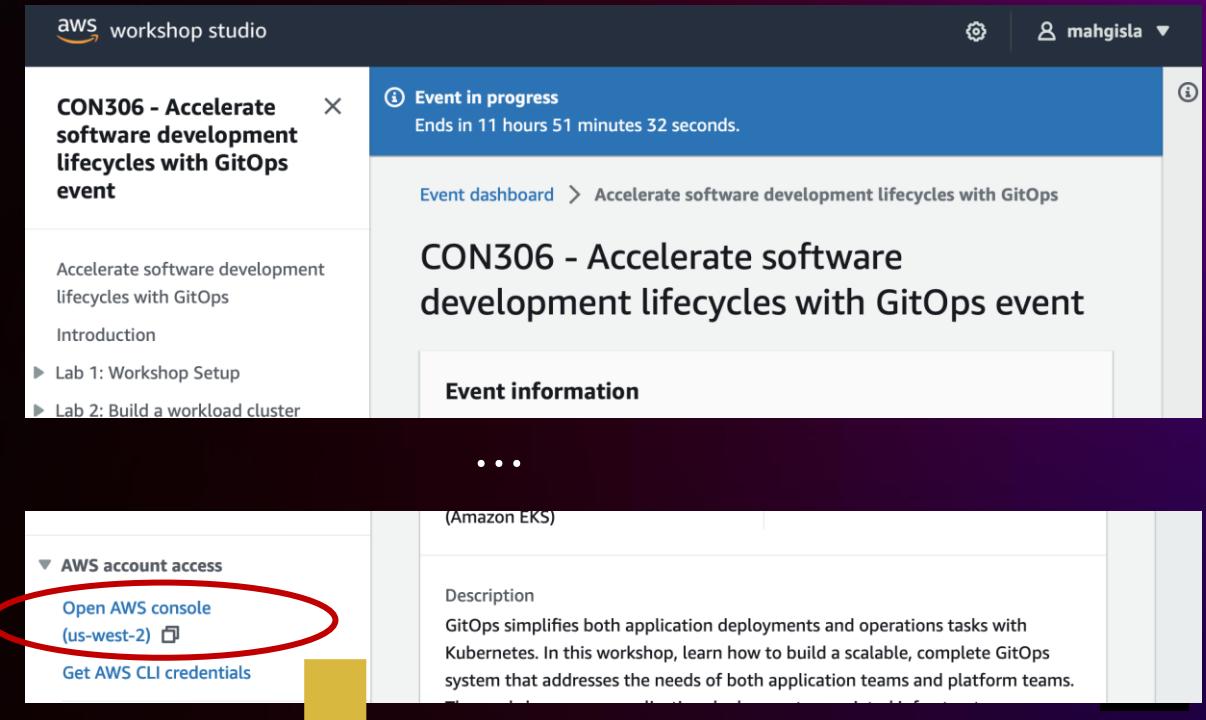
Review lab instructions



The screenshot shows the AWS Workshop Studio interface. The main content area displays the title 'Accelerate software development lifecycles with GitOps'. Below the title, a note states: 'This workshop contains labs to setup a multi-cluster GitOps environment on Amazon Elastic Kubernetes Service (EKS) using Flux and Crossplane.' A note also indicates: 'Note: this workshop can currently only be run at an AWS-hosted event'. At the bottom, there are 'Previous' and 'Next' buttons. On the left, a sidebar lists the following sections: Accelerate software development lifecycles with GitOps (highlighted in orange), Introduction, Build sequence, Lab 1: Workshop Setup, Lab 2: Build a workload cluster, Lab 3: Deploy an application into a workload cluster, Lab 4: Manage workload clusters, and Conclusion.

8

Access your AWS account by selecting **Open AWS Console (us-west-2)**



The screenshot shows the 'Event information' section of the AWS Workshop Studio interface. It displays the event title 'CON306 - Accelerate software development lifecycles with GitOps event'. Below the title, there is an 'Event in progress' message: 'Event in progress' and 'Ends in 11 hours 51 minutes 32 seconds'. The 'Event information' section contains a description: 'GitOps simplifies both application deployments and operations tasks with Kubernetes. In this workshop, learn how to build a scalable, complete GitOps system that addresses the needs of both application teams and platform teams.' A red circle highlights the 'Open AWS console (us-west-2)' button, and a large yellow arrow points from this button to the 'Console Home' button at the bottom of the screen.



Access lab environment

- 1 Visit Workshop Studio: <https://catalog.workshops.aws/join>
- 2 Choose **Email one-time password (OTP)**
- 3 Enter your email address
- 4 Enter OTP
- 5 Enter access code: **142b-0aea4a-0a**
- 6 Review terms and conditions, select the checkbox, and then select **Join event**
- 7 Review lab instructions
- 8 Access your AWS account by selecting **Open AWS Console (us-west-2)** (located at the bottom-left part of the Workshop Studio web page)

Conclusion

What have we accomplished?

- Combined a GitOps controller (Flux) with an infrastructure controller (Crossplane) to build an end-to-end/multi-cluster GitOps
- Learned how to structure Git to support large/complex environments

Next steps

- Visit our GitHub repo: github.com/aws-samples/eks-multi-cluster-gitops. Take it out for a spin. Watch it, star it, fork it, and start sharing feedback through GitHub Issues.

Thank you!

Sheetal Joshi

sheetjos@amazon.com

Islam Mahgoub

mahgisla@amazon.co.uk



Please complete the session
survey in the **mobile app**