

Infrastructure for AI Agents: Kro Templates for Agentic Workloads

Kro and ACK on EKS

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Solutions Architect

AWS

Agenda

01 Agentic
Workloads

02 Growth
Challenges

03 Platform
Engineering

04 KRO + ACK

05 Demo

06 Resources

Agentic Workloads

Agentic workloads are applications where **AI agents act autonomously** to achieve goals by reasoning, planning, and interacting with tools and systems.



Goal Driven

Not just responding but deciding what to do next.



Iterative Reasoning

Plans, executes, evaluates, and adapts.



Tools & System Integrations

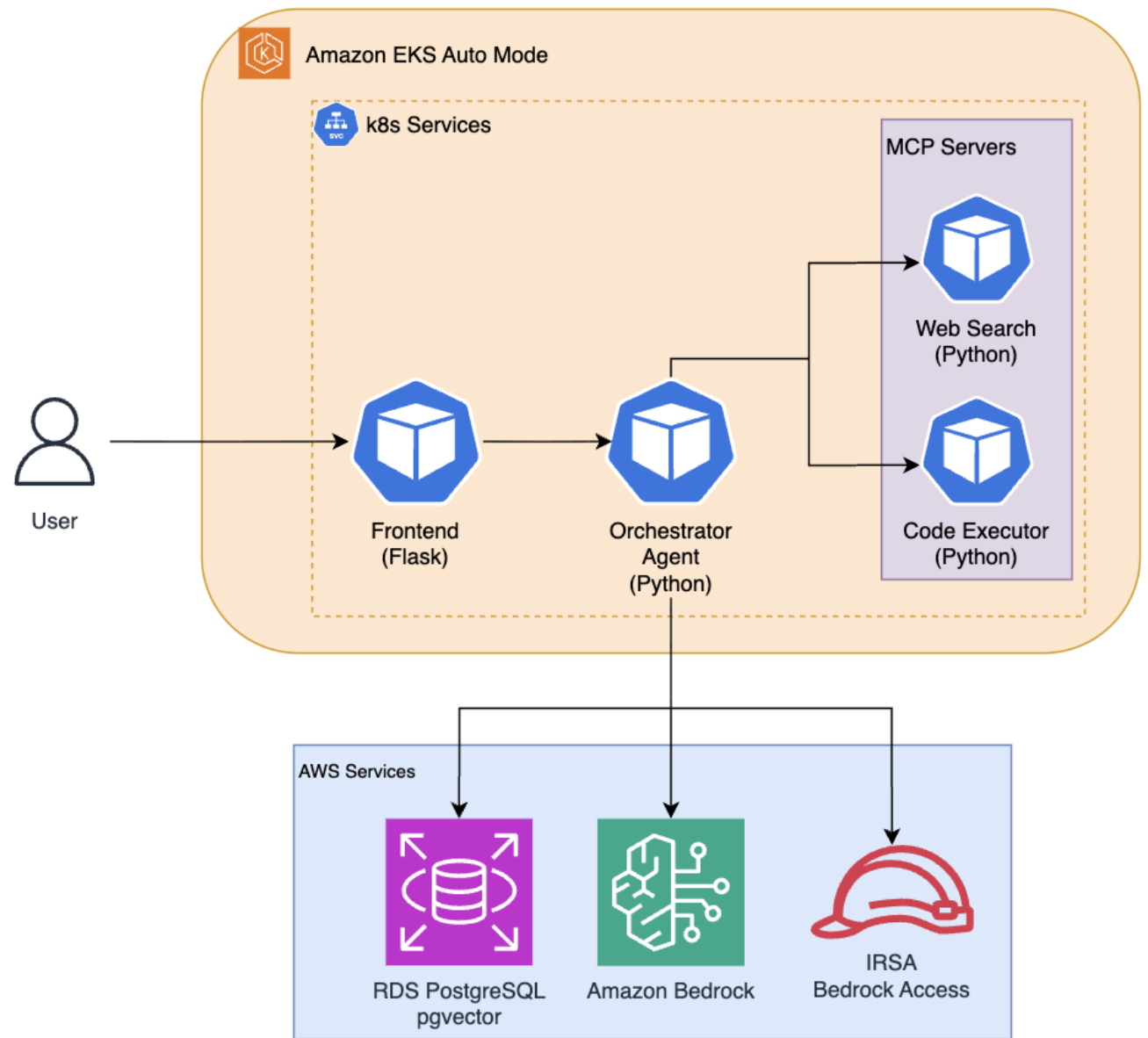
Connects with APIs, databases, services (via MCP, etc.)



Long running & stateful

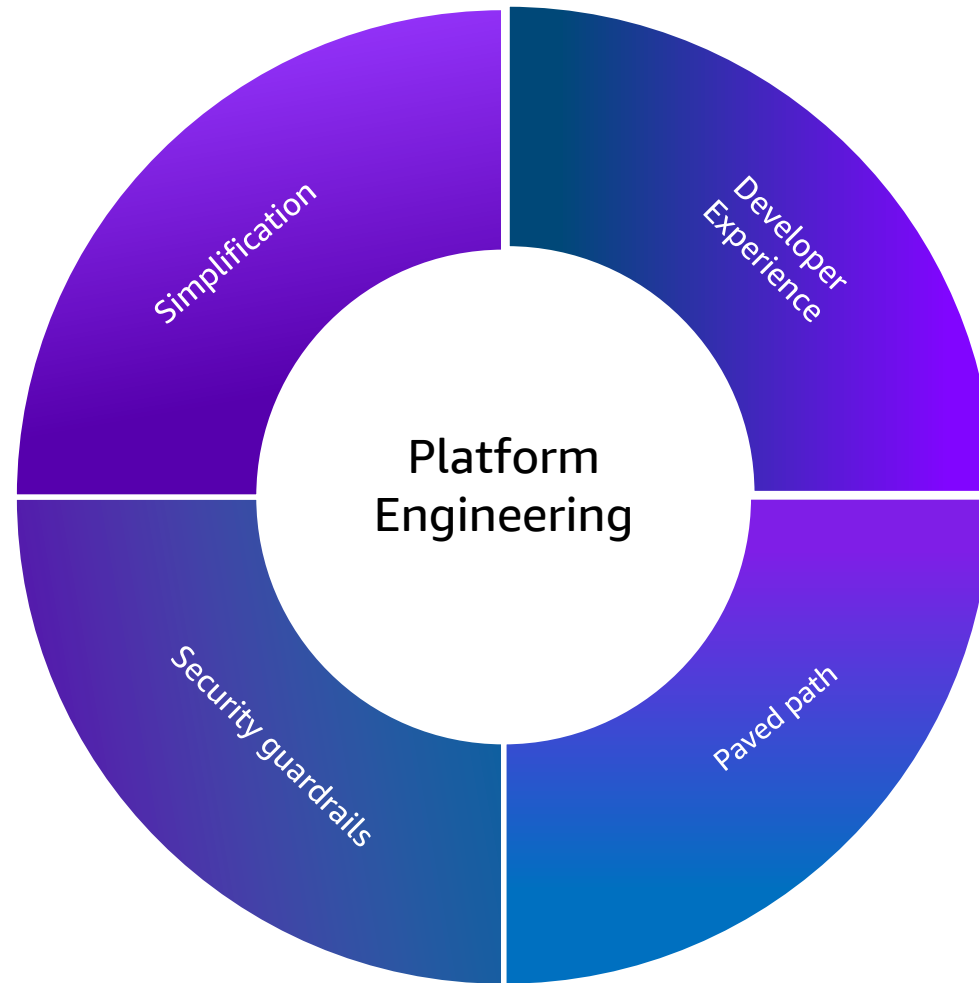
Maintain context across multiple steps.

Example: AI Research Assistant Agent

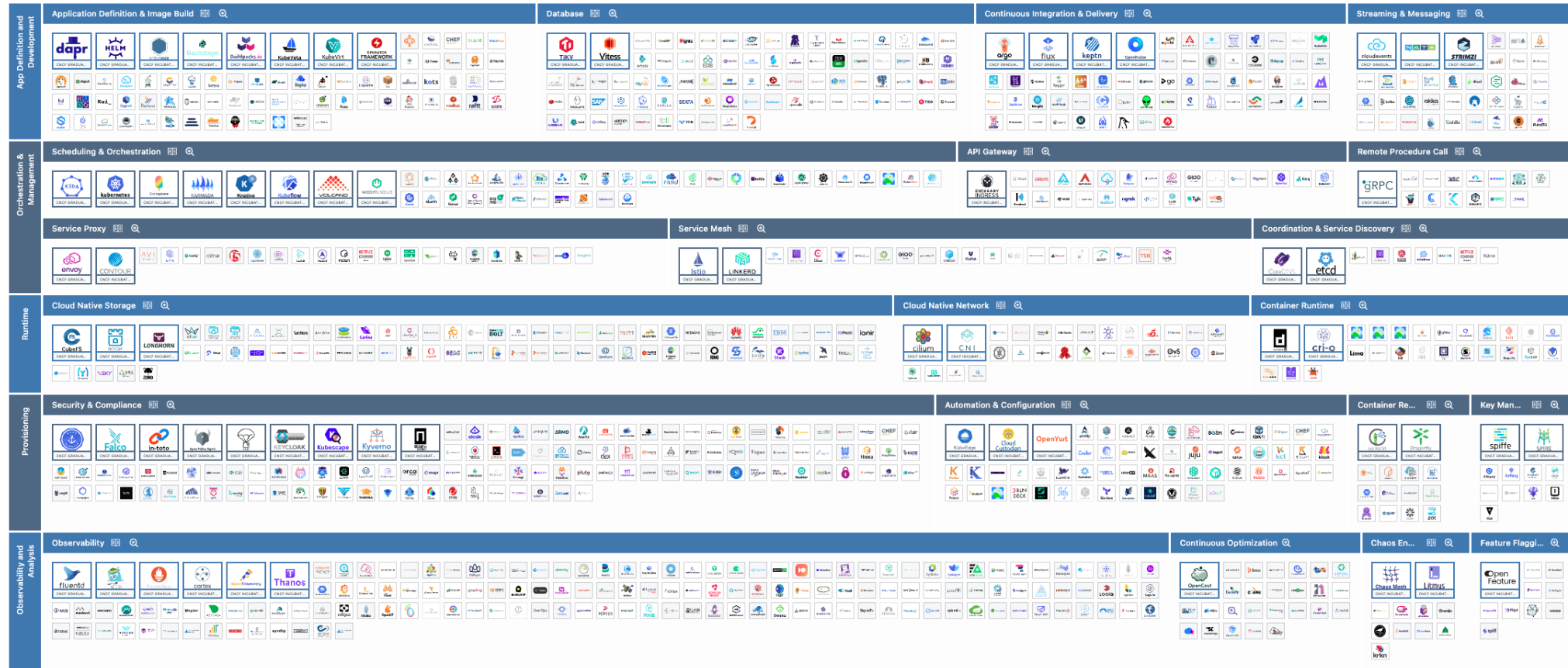


AI Research Assistant Architecture

Platform Engineering



Usually using standard OSS



EKS Capabilities: KRO + ACK



Built with ACK and KRO

- Bring IAC into your standardization layer
- Custom resources for AWS Cloud Resources
- Manage clusters and other cloud resources

Dependencies in place

- Create, manage, and monitor cloud resources alongside the workloads that depend on them
- Remove the split-brain model of multiple tools and sources of truth

Emerging standards

- Leverage KRO for compositions and custom resources
- ACK features are moving to align with upstream standards

Amazon EKS Capabilities



- Add fully managed capabilities to your EKS cluster for efficient environment setup and scaling.
- Capabilities currently available:
 - AWS Controllers for Kubernetes (ACK)
 - Argo CD
 - kro (Kube Resource Orchestrator)
- Using EKS Capabilities eliminates the need to manage installation and upgrades of these components.



AWS Controllers for K8s



ArgoCD

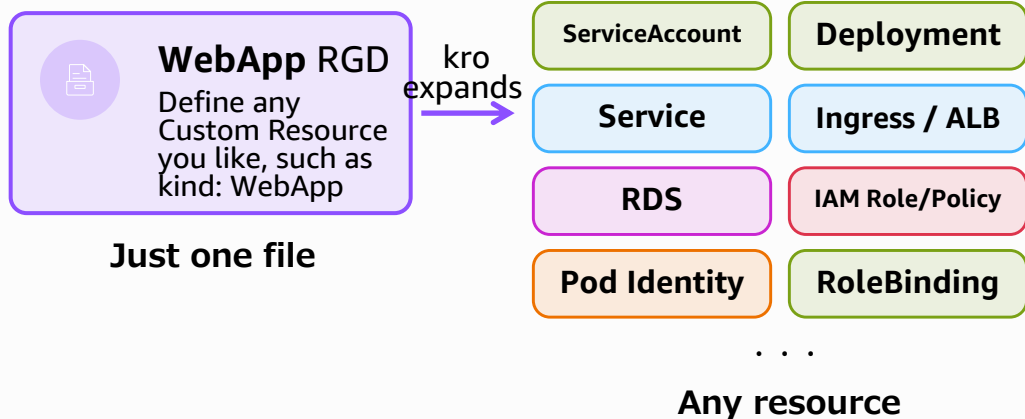


Kube Resource Orchestrator

kro (Kube Resource Orchestrator)

- An open-source resource orchestrator that lets you easily define custom Kubernetes APIs (Custom Resources) to group multiple Kubernetes resources.

Define a Custom Resource that groups multiple resources with just a single manifest

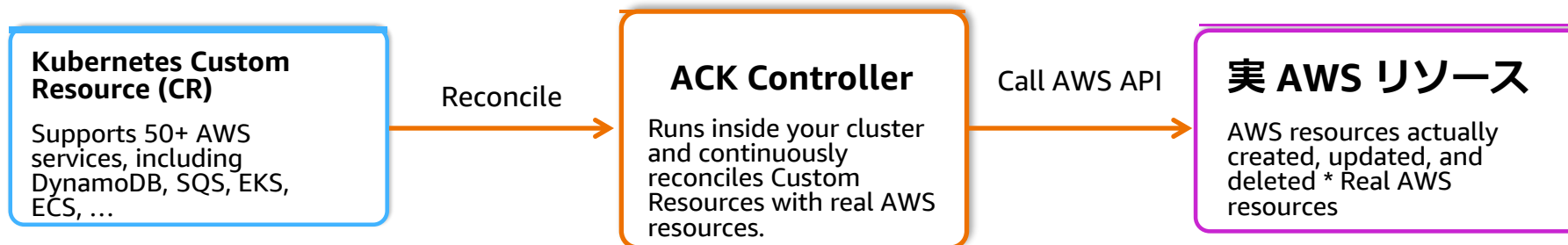


```
apiVersion: kro.run/v1alpha1
kind: ResourceGraphDefinition
metadata:
  name: application
spec:
  schema:
    apiVersion: v1alpha1
    kind: Application
    spec:
      name: string
      image: string | default="nginx:latest"
      replicas: integer | default=3
  resources:
    - id: deployment
      template:
        apiVersion: apps/v1
        kind: Deployment
        metadata:
          name: ${schema.spec.name}
        spec:
          replicas: ${schema.spec.replicas}
          selector:
            matchLabels:
              app: ${schema.spec.name}
        template:
          metadata:
            labels:
              app: ${schema.spec.name}
          spec:
            containers:
              - name: app
                image: ${schema.spec.image}
```

```
apiVersion: v1alpha1
kind: Application
metadata:
  name: my-app
spec:
  name: my-app
  image: nginx:1.27
  replicas: 5
```

ACK (AWS Controllers for Kubernetes)

- An open-source controller that lets you create and manage AWS resources directly from Kubernetes manifests.



```
apiVersion: dynamodb.services.k8s.aws/v1alpha1
kind: Table
metadata:
  name: $TABLE_NAME
spec:
  tableName: $TABLE_NAME
  billingMode: PAY_PER_REQUEST
  tableClass: STANDARD
  attributeDefinitions:
    - attributeName: Bill
      attributeType: S
    - attributeName: Total
      attributeType: S
  keySchema:
    - attributeName: Bill
      keyType: HASH
    - attributeName: Total
      keyType: RANGE
```

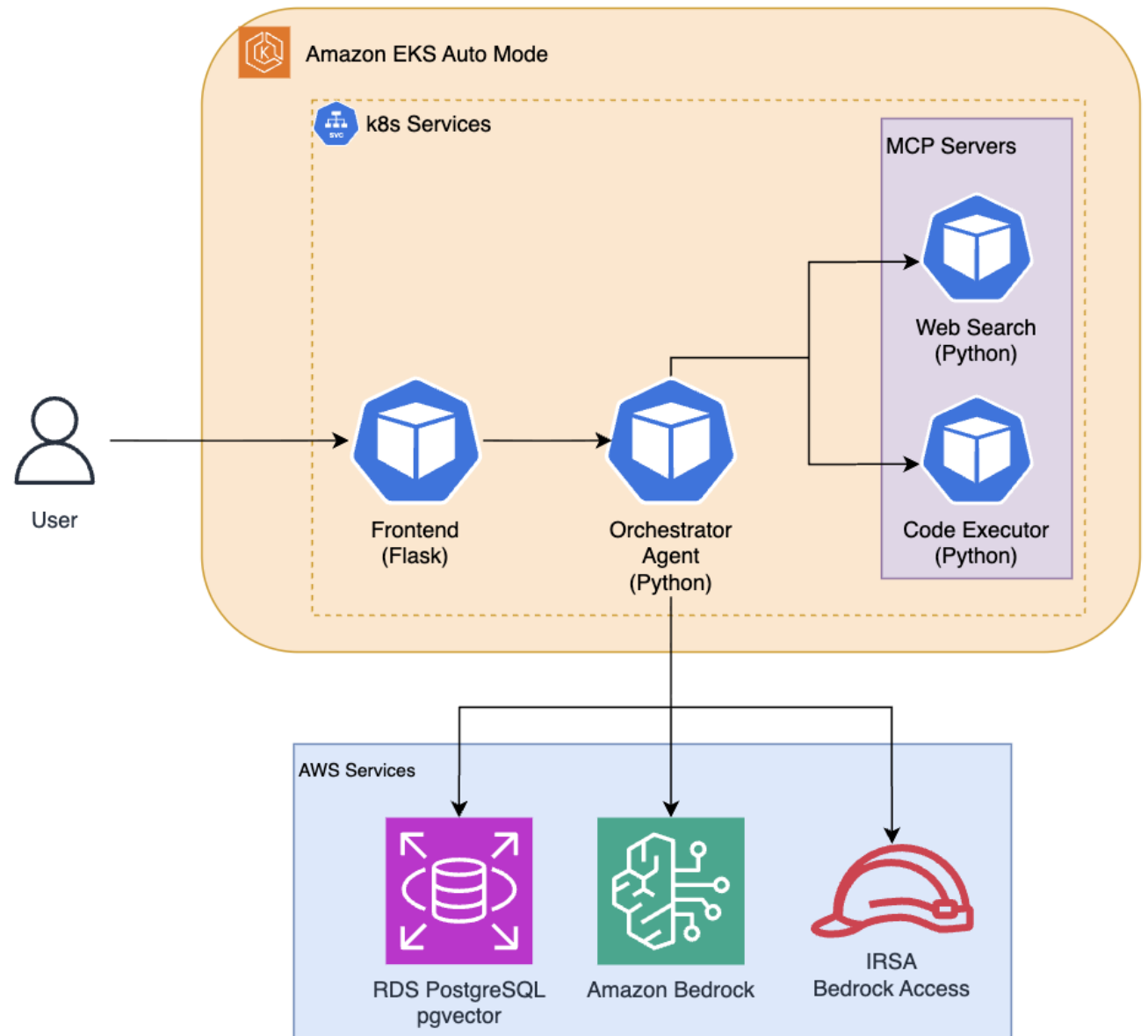
Why ACK

- **Single workflow:** manage apps and AWS resources declaratively from Kubernetes
- **Integrates with GitOps:** Argo CD syncs and prunes AWS resources as well
- **Works with kro:** define ACK Custom Resources as RGD resources

 AWS Account

DEMO:

Template and deploy AI ResearchAssistant Agent using kro and ACK

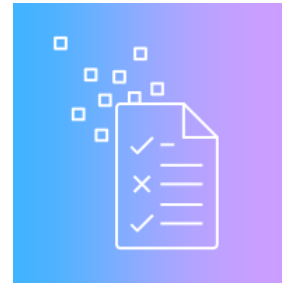


AI Research Assistant Architecture

Learn more and get started!



Launch Blog



User Guide



Feature Page



FAQs

Thank you!

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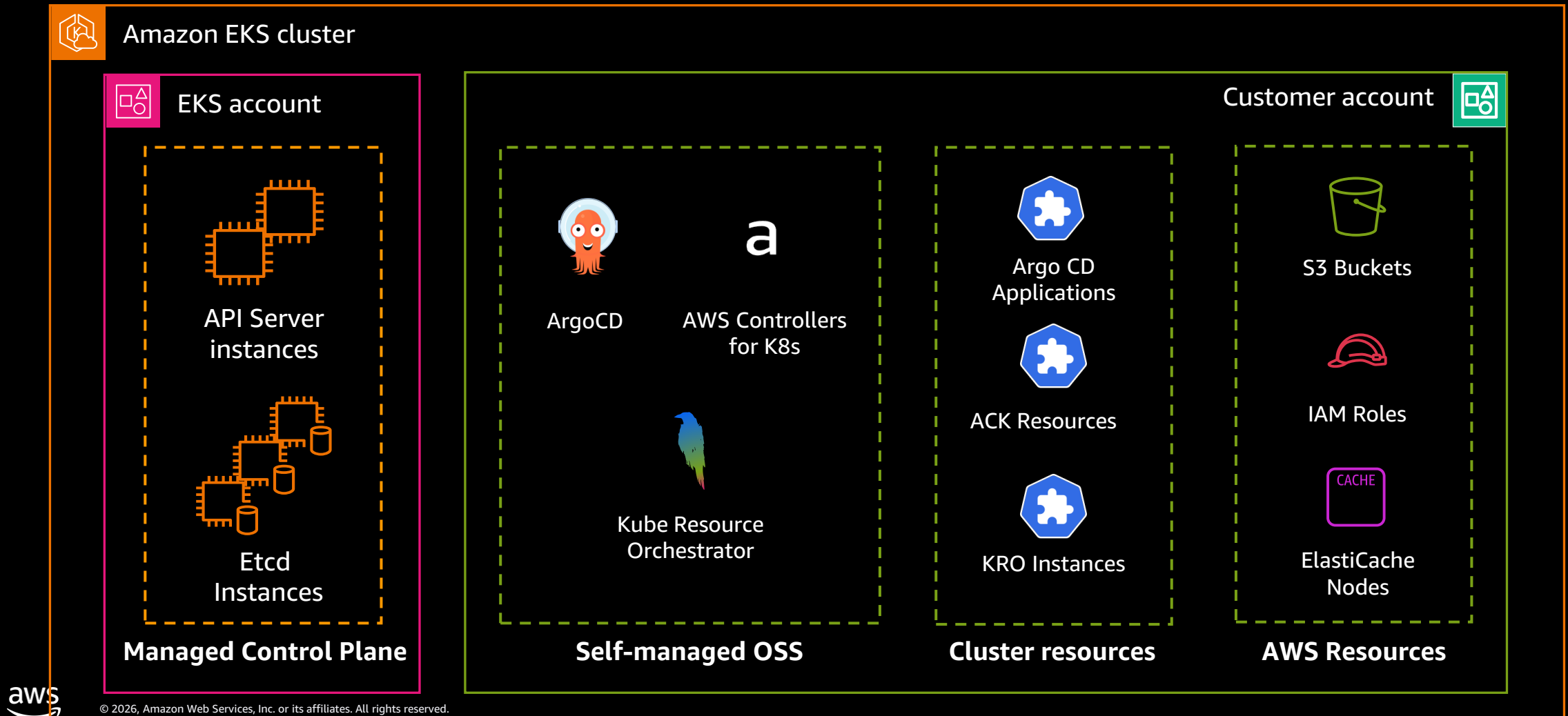
linkedin.com/hasnainrazz

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Amazon EKS Capabilities の仕組み (1)

各機能をセルフマネージドで運用する場合



Amazon EKS Capabilities の仕組み (2)

EKS Capabilities を利用する場合

