AWS re:Invent

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CON319

Simplify lifecycle management for Kubernetes clusters with Amazon EKS

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Agenda

- Kubernetes
- Amazon Elastic Kubernetes Service (Amazon EKS)
- AWS Cloud Development Kit (AWS CDK)
- eksctl
- Terraform
- Demo
- Discussion & QA
- Summary

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What is Kubernetes?

Kubernetes is a container orchestration system that started as an open-source project from Google

Essential to the cloud-native movement

Designed to run everywhere from on-premises to the cloud

Automatic scaling and self-healing

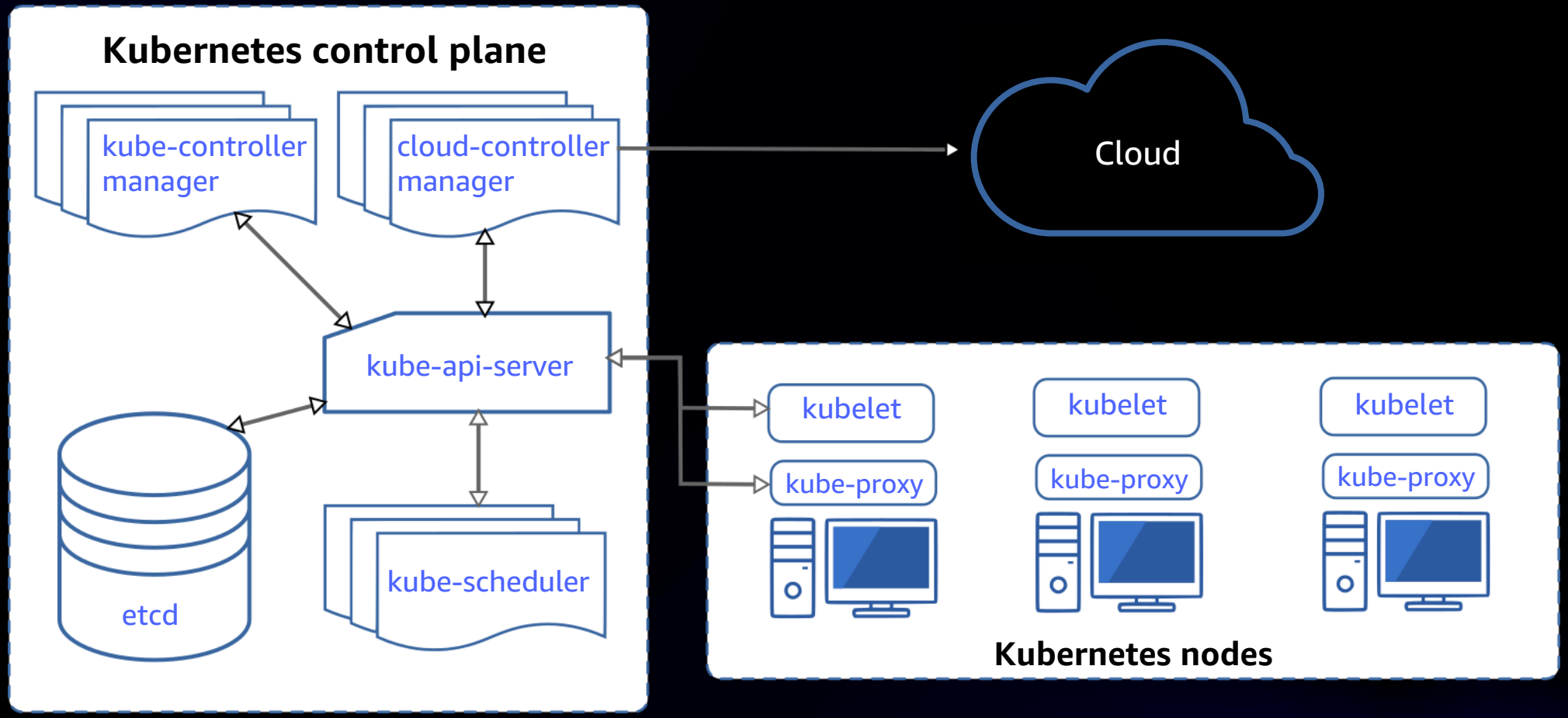
Innovative declarative resource model



aws

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Architecture



https://kubernetes.io/docs/concepts/overview/components/

aws

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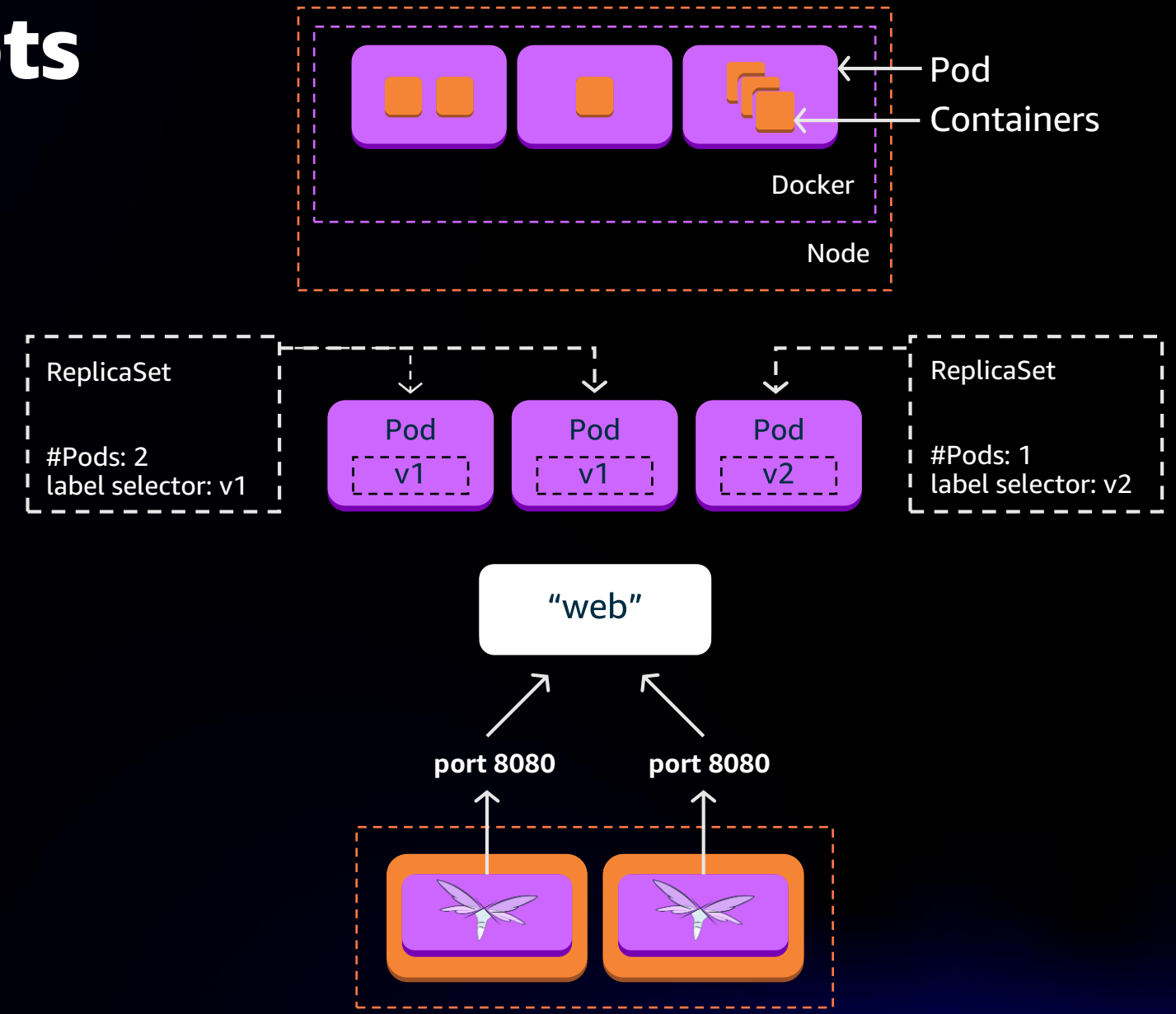
Kubernetes concepts

Pods: Co-located group of containers that share an IP, namespace, storage volume

Replica set: Manages the lifecycle of pods and ensures specified number are running

Service: Single, stable name for a set of pods, also acts as a load balancer

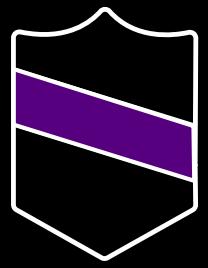
Label: Used to organize and select group of objects



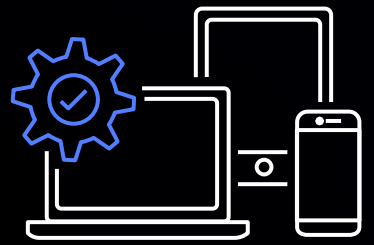
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Amazon EKS

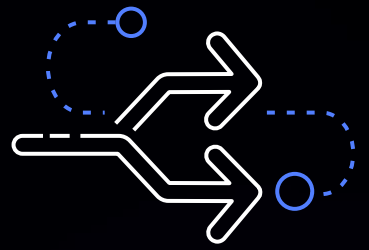
FULLY MANAGED KUBERNETES SERVICE



Security first

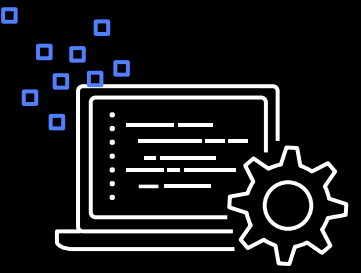


Production workloads



Native and upstream

Seamless integrations



Open source contribution

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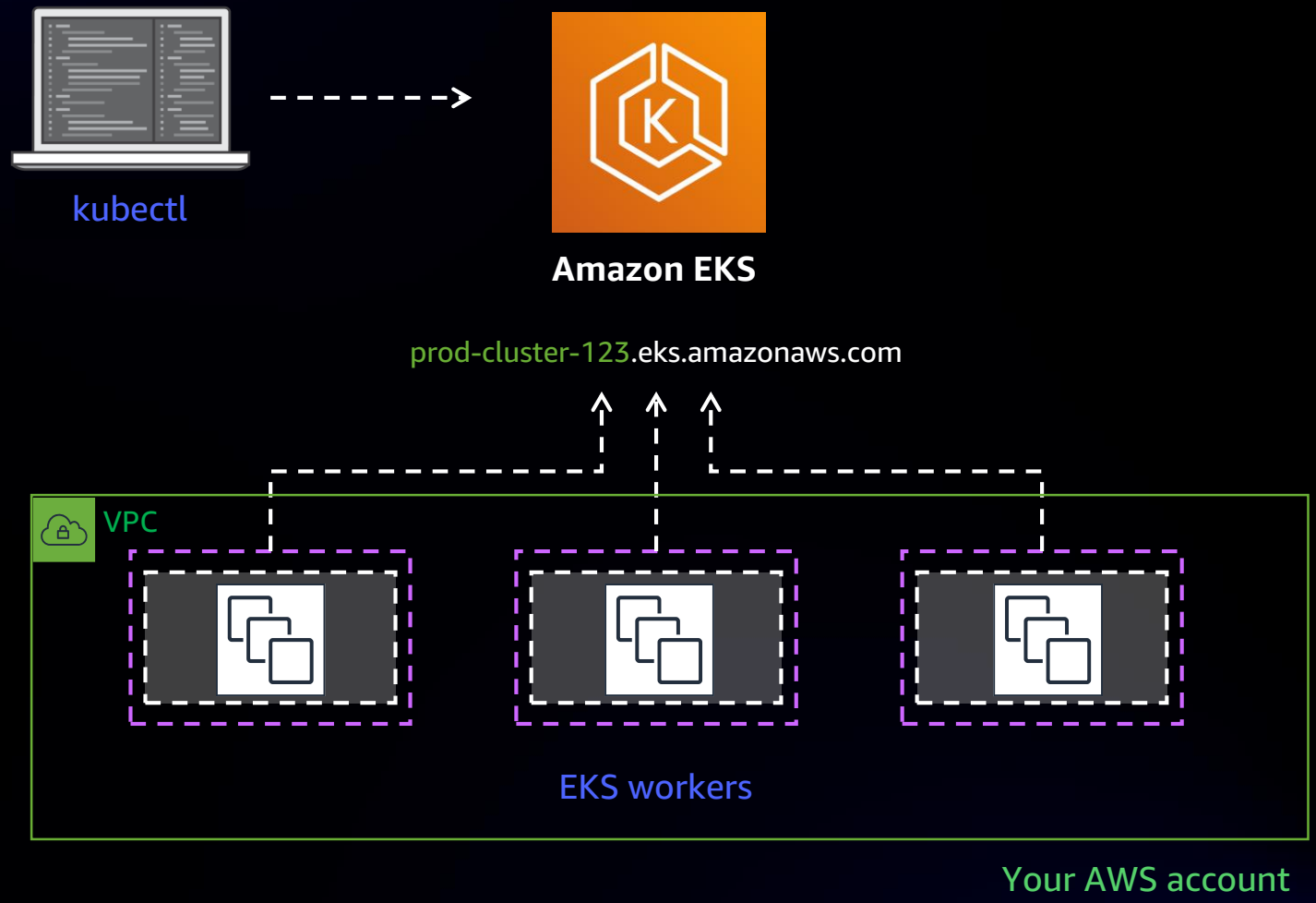
Amazon EKS

WHY IS IT DIFFERENT THAN KUBERNETES ON AMAZON EC2?

- We deploy the Kubernetes control plane and etcd in a highly available configuration across three Availability Zones
- We manage the control plane for you in a similar way to our Amazon Relational Database Service (Amazon RDS) service
- We provide a network (CNI) plugin that integrates pod networking natively with Amazon Virtual Private Cloud (Amazon VPC)
- We integrate user access to the Kubernetes command line interface (kubectl) and Amazon API Gateway with AWS Identity and Access Management (IAM)

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Amazon EKS architecture



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EKS customers













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AWS Cloud Development Kit (AWS CDK)

AN OPEN SOURCE MULTI-LANGUAGE SOFTWARE DEVELOPMENT FRAMEWORK FOR MODELING AWS CLOUD INFRASTRUCTURE AS REUSABLE COMPONENTS



Familiar
Your language,
just code



Tool support
Autocomplete,
inline documentation



Abstraction
Sane defaults,
reusable classes



aws

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AWS CDK summary

```typescript
export class SimpleVpc extends cdk.Stack {
  constructor(scope: cdk.Construct, id: string) {
    super(scope, id);

    new ec2.Vpc(this, 'Vpc')
  }
}
```

cdk synth



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eksctl

CLI For managing EKS clusters built by Weaveworks on GitHub



eksctl create cluster

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Terraform

Terraform is an open-source infrastructure as code software tool that provides a consistent CLI workflow to manage hundreds of cloud services

```
module "aws_eks" {
source = "terraform-aws-modules/eks/aws"
version = "v17.24.0"

manage_aws_auth = false

cluster_name = var.cluster_name
cluster_version = var.kubernetes_version
…
}
```

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Thank you!

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