2019

Global Azure
BOOTCAMP

Azure Kubernetes Service

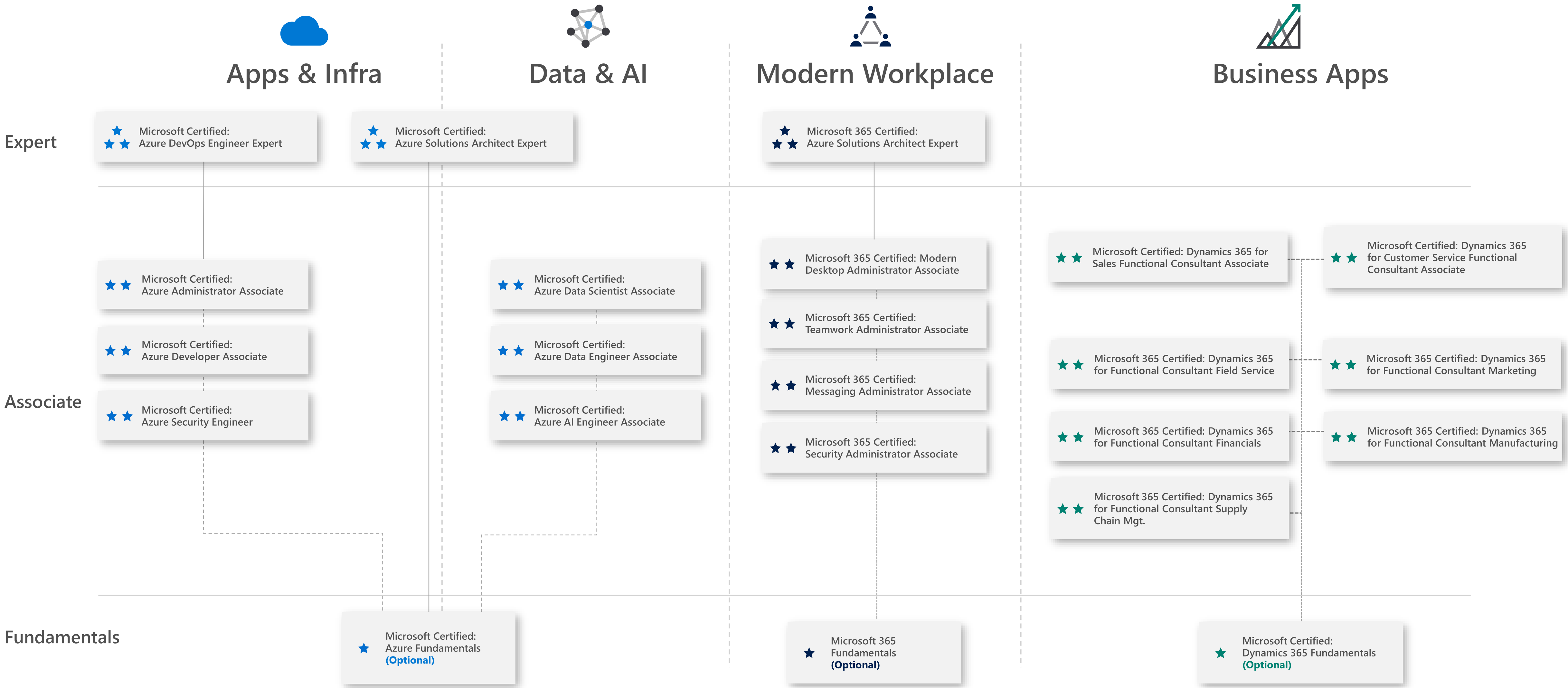
April 27,2019

ฟูเกียรติ จุลนวล

@fujute

//fuju.Org

Microsoft certifications



Apps & Infra

Expert

★★★ Microsoft Certified: Azure DevOps Engineer Expert

★★★ Microsoft Certified: Azure Solutions Architect Expert

Associate

★★ Microsoft Certified: Azure Administrator Associate

★★ Microsoft Certified: Azure Developer Associate

★★ Microsoft Certified: Azure Security Engineer

Fundamentals

★ Microsoft Certified: Azure Fundamentals **(Optional)**

Data & AI

★★ Microsoft Certified: Azure Data Scientist Associate

★★ Microsoft Certified: Azure Data Engineer Associate

★★ Microsoft Certified: Azure AI Engineer Associate

Modern Workplace

★★★ Microsoft 365 Certified: Azure Solutions Architect Expert

★★ Microsoft 365 Certified: Modern Desktop Administrator Associate

★★ Microsoft 365 Certified: Teamwork Administrator Associate

★★ Microsoft 365 Certified: Messaging Administrator Associate

★★ Microsoft 365 Certified: Security Administrator Associate

★ Microsoft 365 Fundamentals **(Optional)**

Business Apps

★★ Microsoft Certified: Dynamics 365 for Sales Functional Consultant Associate

★★ Microsoft Certified: Dynamics 365 for Customer Service Functional Consultant Associate

★★ Microsoft 365 Certified: Dynamics 365 for Functional Consultant Field Service

★★ Microsoft 365 Certified: Dynamics 365 for Functional Consultant Marketing

★★ Microsoft 365 Certified: Dynamics 365 for Functional Consultant Financials

★★ Microsoft 365 Certified: Dynamics 365 for Functional Consultant Manufacturing

★★ Microsoft 365 Certified: Dynamics 365 for Functional Consultant Supply Chain Mgt.

★ Microsoft Certified: Dynamics 365 Fundamentals **(Optional)**

Ref: aka.ms/rolebasedcert

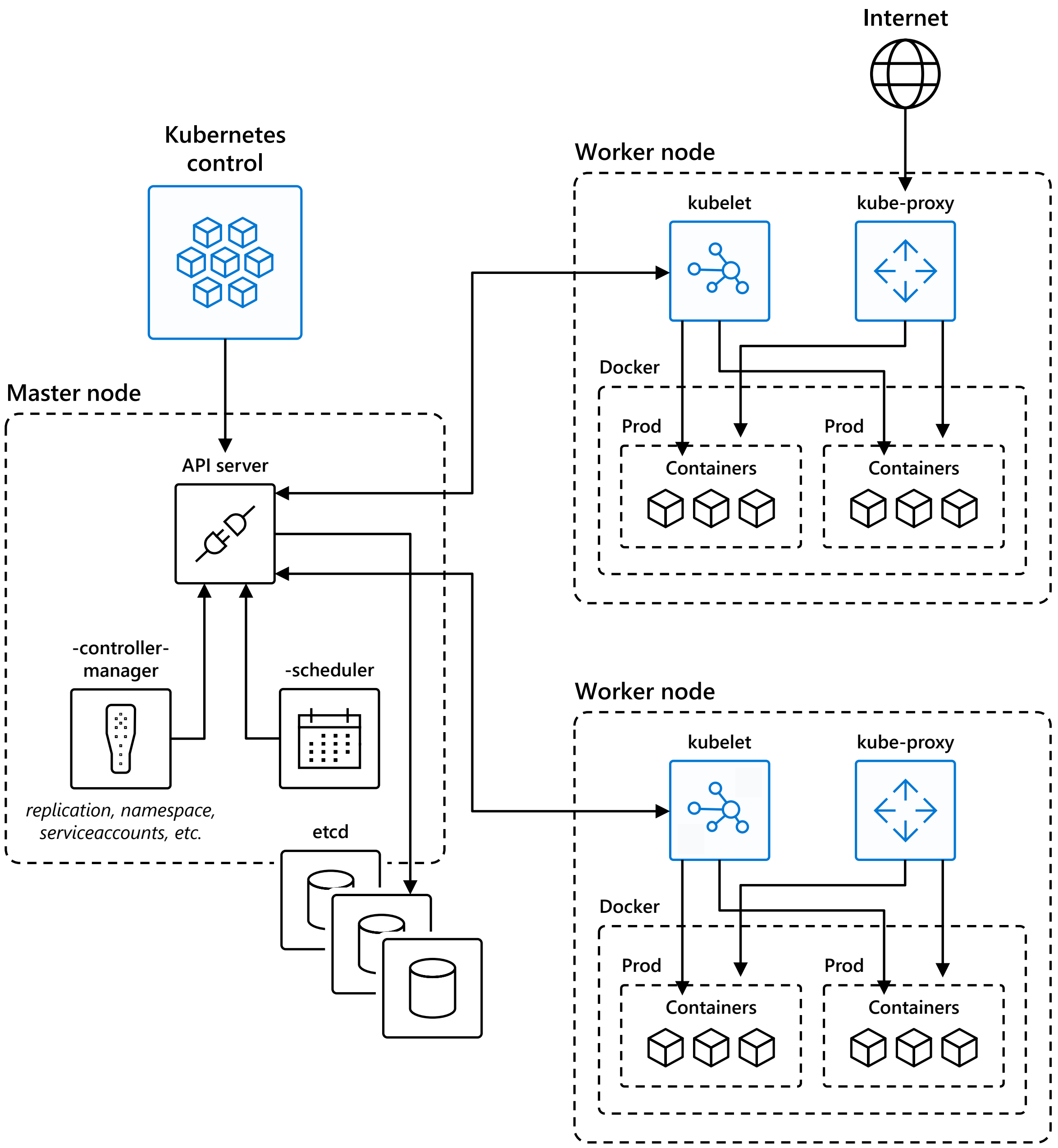
Kubernetes 101

1. Kubernetes users communicate with API server and apply desired state

2. Master nodes actively enforce desired state on worker nodes

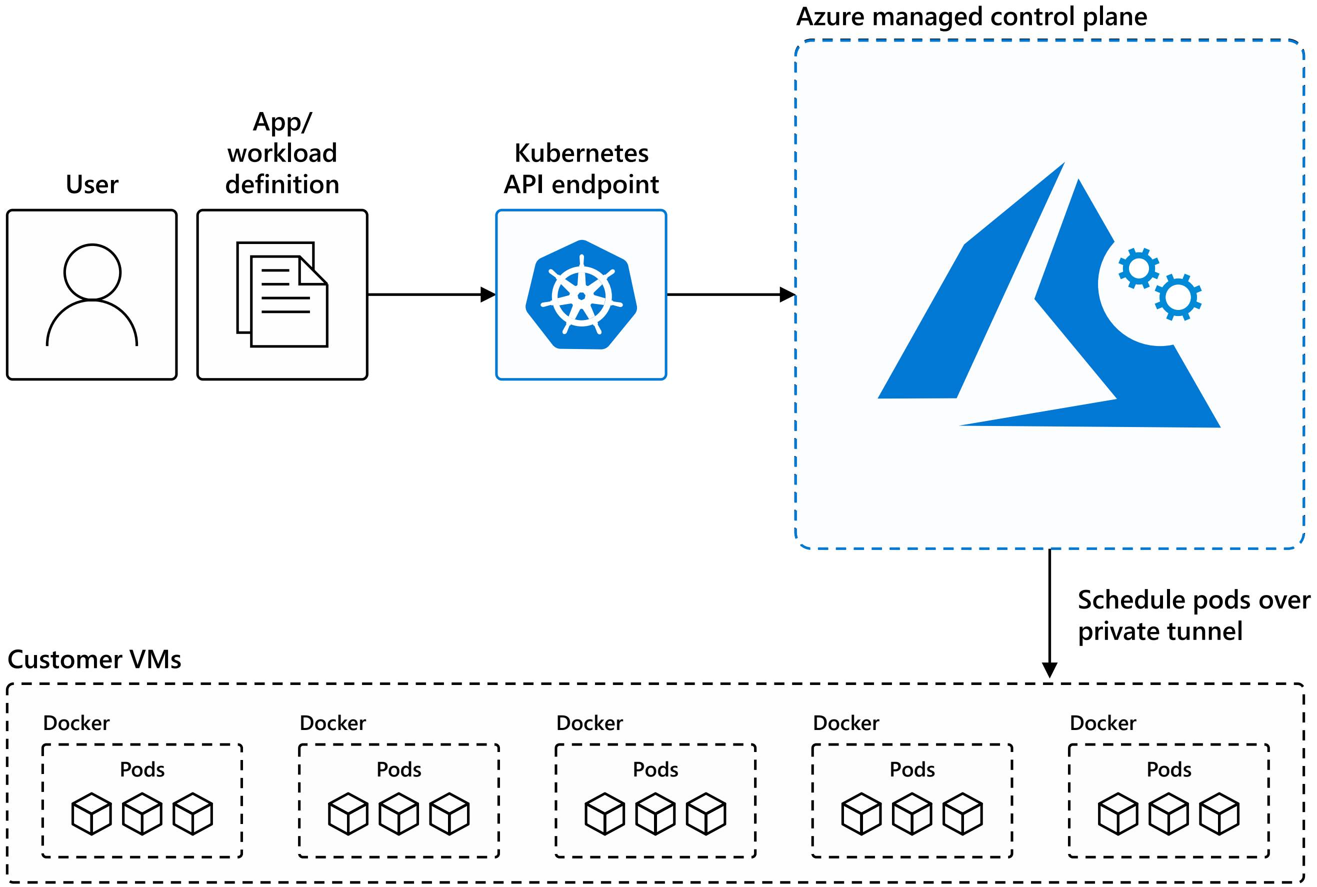
3. Worker nodes support communication between containers

4. Worker nodes support communication from the Internet



How managed Azure Kubernetes Service works

- Automated upgrades, patches
- High reliability, availability
- Easy, secure cluster scaling
- Self-healing
- API server monitoring
- At no charge



Azure managed control plane

User

App/ workload definition

Kubernetes API endpoint

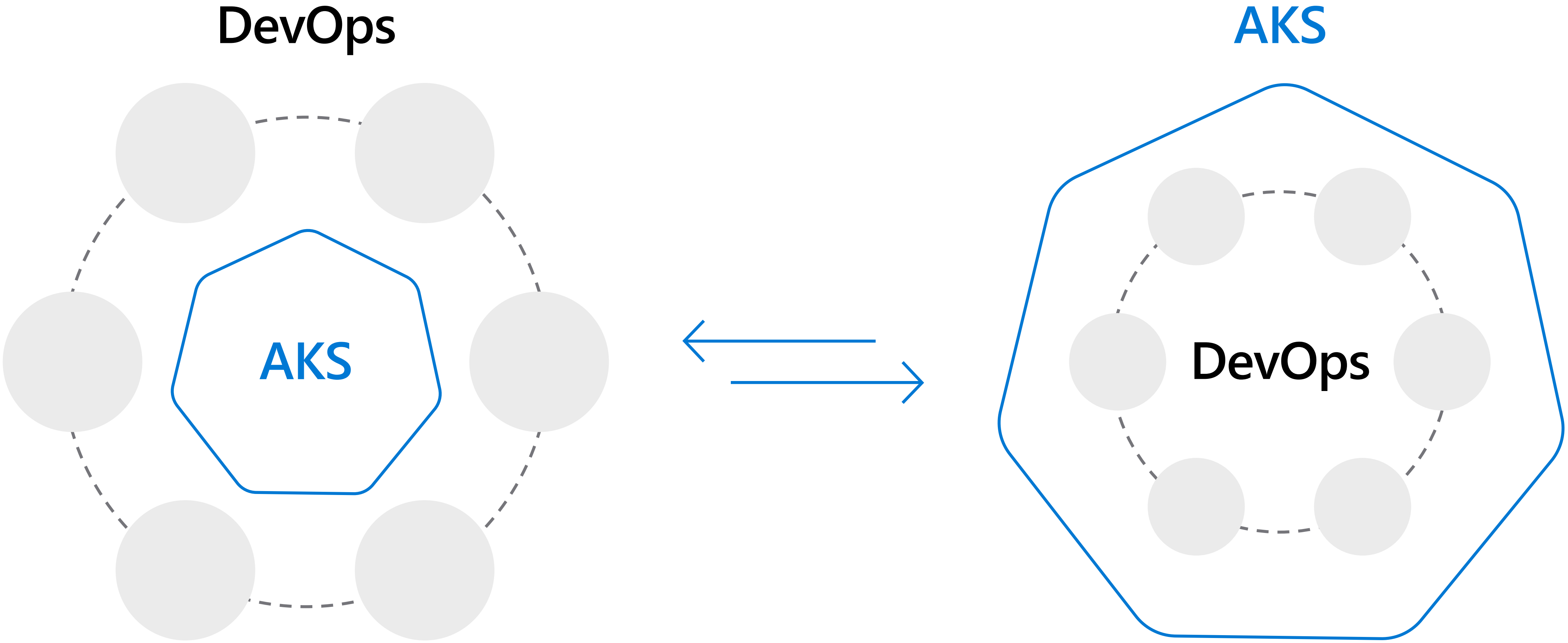
Schedule pods over private tunnel

Customer VMs

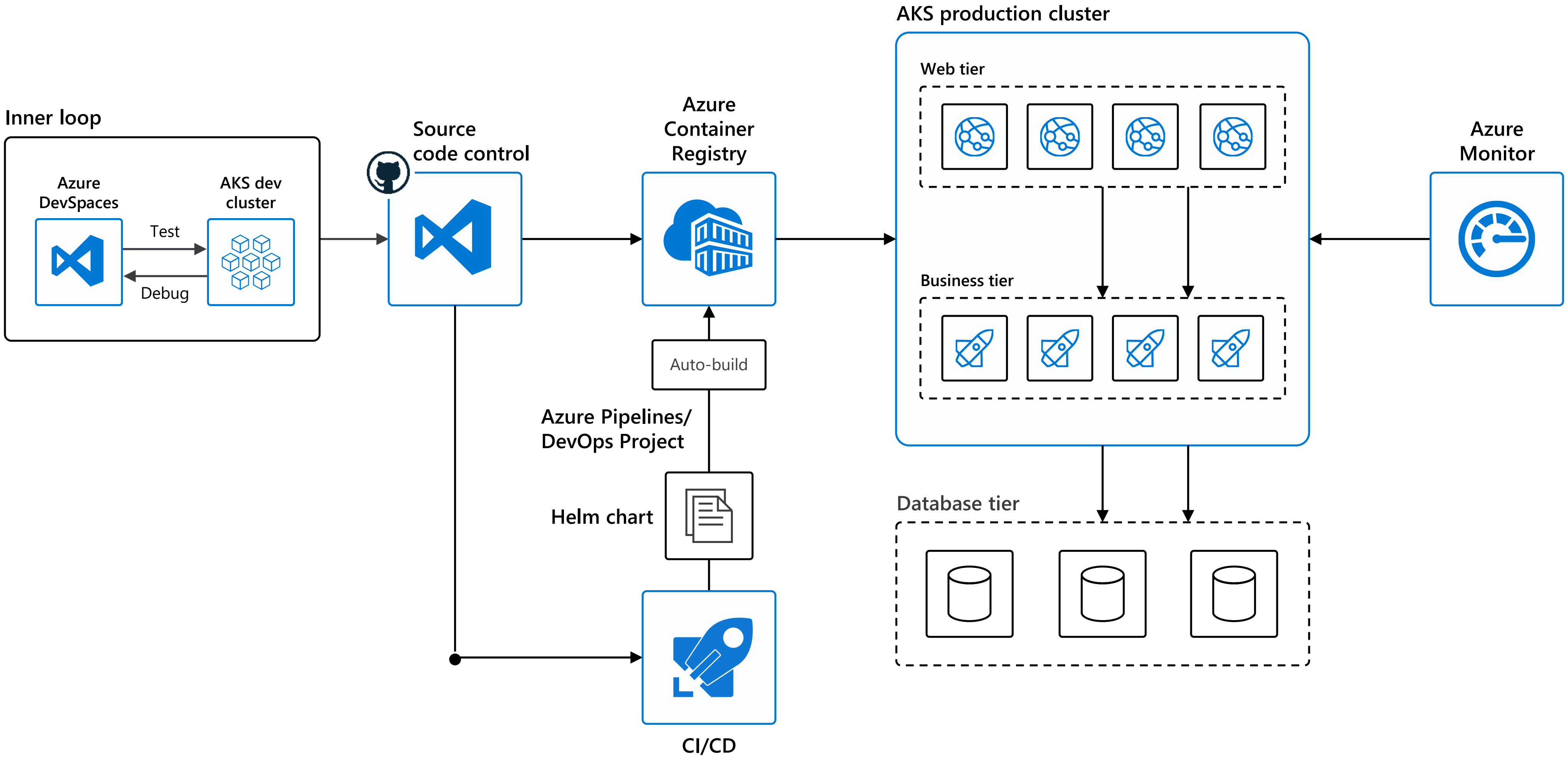
# Create AKS Cluster

```
az aks create -n $CLUSTERNAME -g $RGNAME \
--kubernetes-version $K8SVERSION \
--service-principal $APPID \
--client-secret $CLIENTSECRET \
--generate-ssh-keys -l $LOCATION \
--node-count 3 \
--enable-addons monitoring \
--no-wait
```

Kubernetes and DevOps: better together

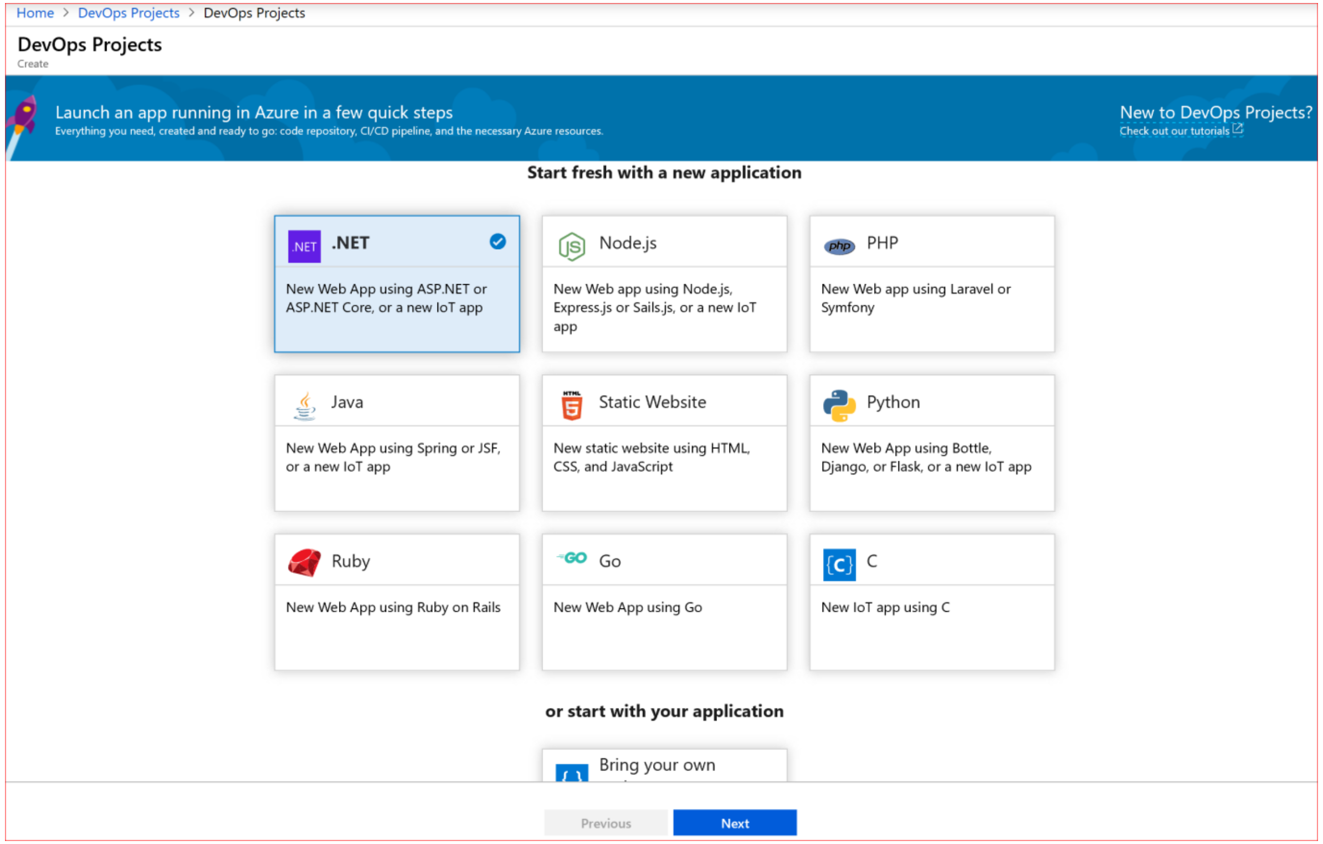


Integrated end-to-end Kubernetes experience



Get Started with Azure DevOps Project

- Automatic pipeline creation
- Works with Windows and Linux
- Expanding to more languages, frameworks, and Azure services
- Creates the scaffolding for a DevOps process that will grow with you



Home > DevOps Projects > DevOps Projects

DevOps Projects

Create

Launch an app running in Azure in a few quick steps

Everything you need, created and ready to go: code repository, CI/CD pipeline, and the necessary Azure resources.

New to DevOps Projects?

Check out our tutorials

Start fresh with a new application

.NET ✓

New Web App using ASP.NET or ASP.NET Core, or a new IoT app

Node.js

New Web app using Node.js, Express.js or Sails.js, or a new IoT app

PHP

New Web app using Laravel or Symfony

Java

New Web App using Spring or JSF, or a new IoT app

Static Website

New static website using HTML, CSS, and JavaScript

Python

New Web App using Bottle, Django, or Flask, or a new IoT app

Ruby

New Web App using Ruby on Rails

Go

New Web App using Go

C

New IoT app using C

or start with your application

Bring your own

Azure makes Kubernetes easy

Deploy and manage Kubernetes with ease

Task	The Old Way	With Azure
Create a cluster	Provision network and VMs Install dozens of system components including etcd Create and install certificates Register agent nodes with control plane	`az aks create`
Upgrade a cluster	Upgrade your master nodes Cordon/drain and upgrade worker nodes individually	`az aks upgrade`
Scale a cluster	Provision new VMs Install system components Register nodes with API server	`az aks scale`

Azure makes Kubernetes easy

Accelerate containerized application development

Task	The Old Way	With Azure
Build a containerized app and deploy to Kubernetes	Build the app Write a Dockerfile Build the container image Push the container to a registry Write Kubernetes manifests/Helm chart Deploy to Kubernetes	`draft init` to configure your environment `draft create` to auto-create Dockerfile/Helm chart `draft up` to deploy to Kubernetes
Build a containerized app and deploy to Kubernetes	Set up a local dev environment using Minikube Determine the transitive closure of your dependencies Identify behavior of dependencies for key test cases Stub out dependent services with expected behavior Make local changes, check-in, and hope things work Validate with application logs	Use DevSpaces Do breakpoint debugging in your IDE
Expose web apps to the internet with a DNS entry	Deploy an ingress controller Create a load-balanced IP for it Add an ingress resource to your deployment Acquire a custom domain Create a DNS A-record for your service	Turn HTTP application routing on in your cluster Add an ingress resource to your deployment

Azure makes Kubernetes easy

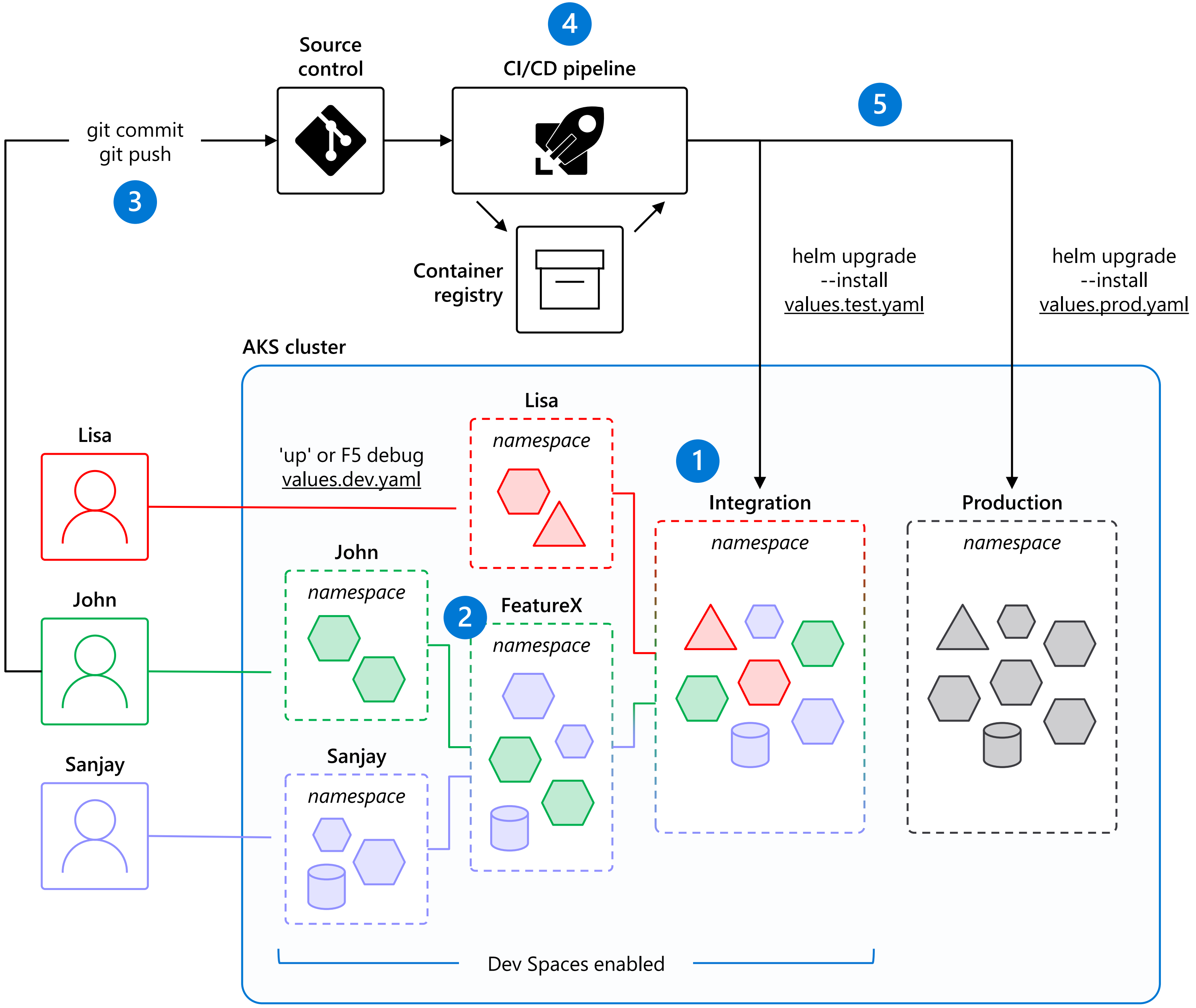
Roll out new features seamlessly (CI/CD)

Task	The Old Way	With Azure
Set up a CI/CD pipeline and deploy to Kubernetes	Create git repo Create a build pipeline Create a container registry Create a Kubernetes cluster Configure build pipeline to push to container registry Configure build pipeline to deploy to Kubernetes	Create an Azure DevOps project with AKS as a target
Make container images available for deployment worldwide	Create a container registry in every region Configure build pipeline with multiple endpoints Loop through all regions and push following build	Create an Azure Container Registry with geo-replication Push your image to a single endpoint
Track health with consolidated cluster and application logs	Choose a logging solution Deploy log stack in your cluster or provision a service Configure and deploy a logging agent onto all nodes	Checkbox “container monitoring” in the Azure portal

Dev Spaces

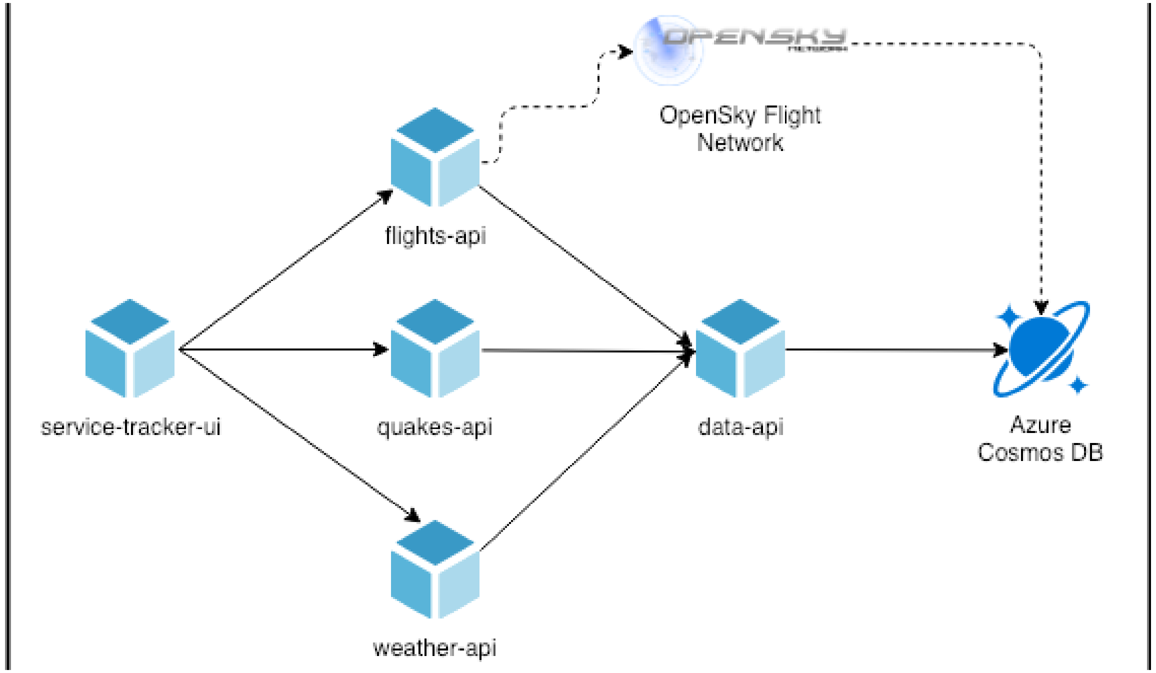
1. The "Integration" dev space is running a full baseline version of the entire application
2. John and Sanjay are collaborating on FeatureX; it is setup as a dev space and running all the modified services required to implement a feature
3. Code is committed to the master source control
4. A CI/CD pipeline can be triggered to deploy into "Integration," which updates the team's baseline
5. The same Helm assets used during development are used in later environments by the CD system

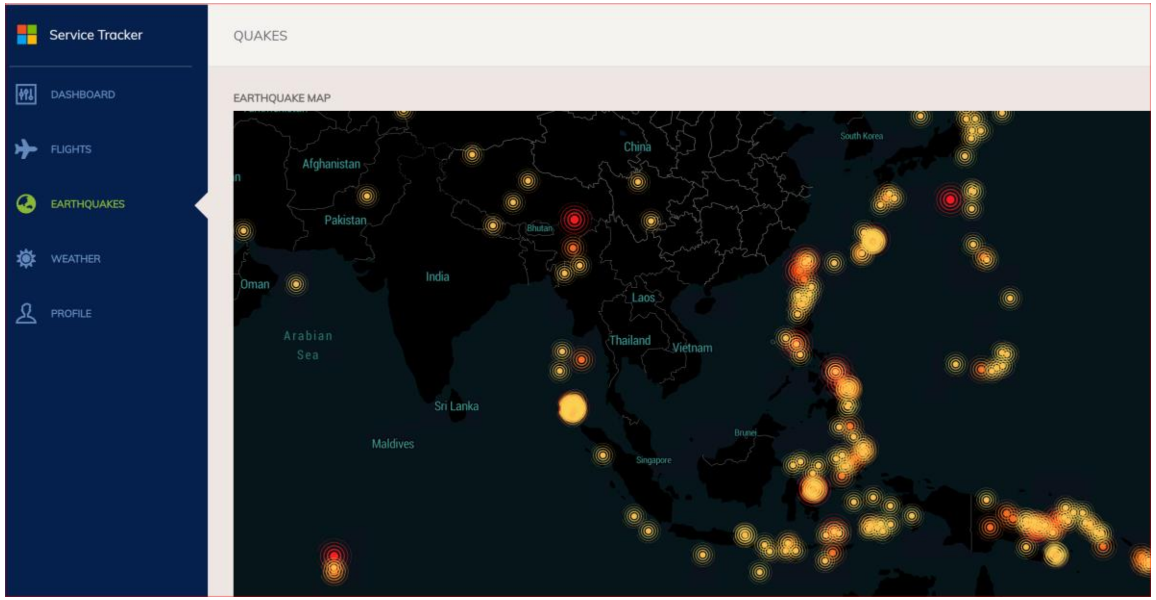
*Dev Spaces is enabled per Kubernetes namespaces and can be defined as anything. Any namespace in which Dev Spaces is NOT enabled runs *unaffected*.*



Work how you want with opensource tools and APIs

	Development	DevOps	Monitoring	Networking	Storage	Security
Take advantage of services and tools in the Kubernetes ecosystem	HELM DRAFT Virtual kubelet CNAB	JFrog HashiCorp BRIGADE	Prometheus fluentd Grafana DATADOG	CNI Networking TIGERA	MAPR portworx	Twistlock aqua heptio
Leverage 100+ turn-key Azure services	VS Code	DevOps ARM	Azure Monitor	Azure VNET Azure Policy	Azure Storage	Container Registry Azure Active Directory Key Vault





https://github.com/Azure/kubernetes-hackfest
or
http://www.fuju.org/?page_id=37820

Resources

Top scenarios

Top scenarios for Kubernetes on Azure

Lift and shift to containers

Cost saving

without refactoring your app

Microservices

Agility

Faster application development

Machine learning

Performance

Low latency processing

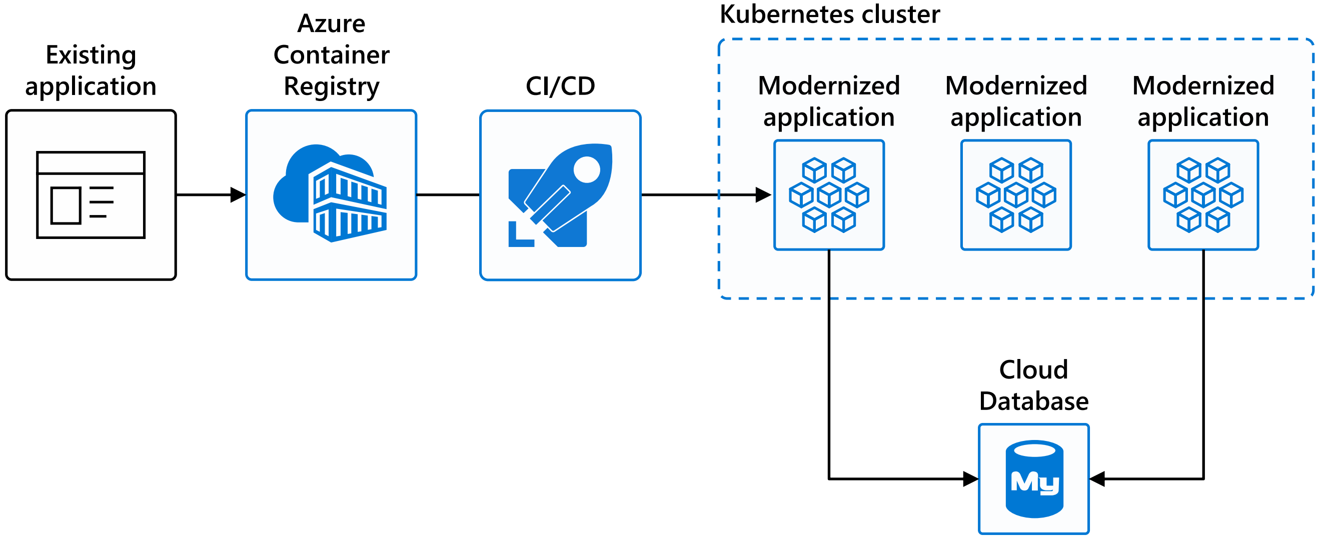
IoT

Portability

Build once, run anywhere

App modernization without code changes

- Speed application deployments by using container technology
- Defend against infrastructure failures with container orchestration
- Increase agility with continuous integration and continuous delivery

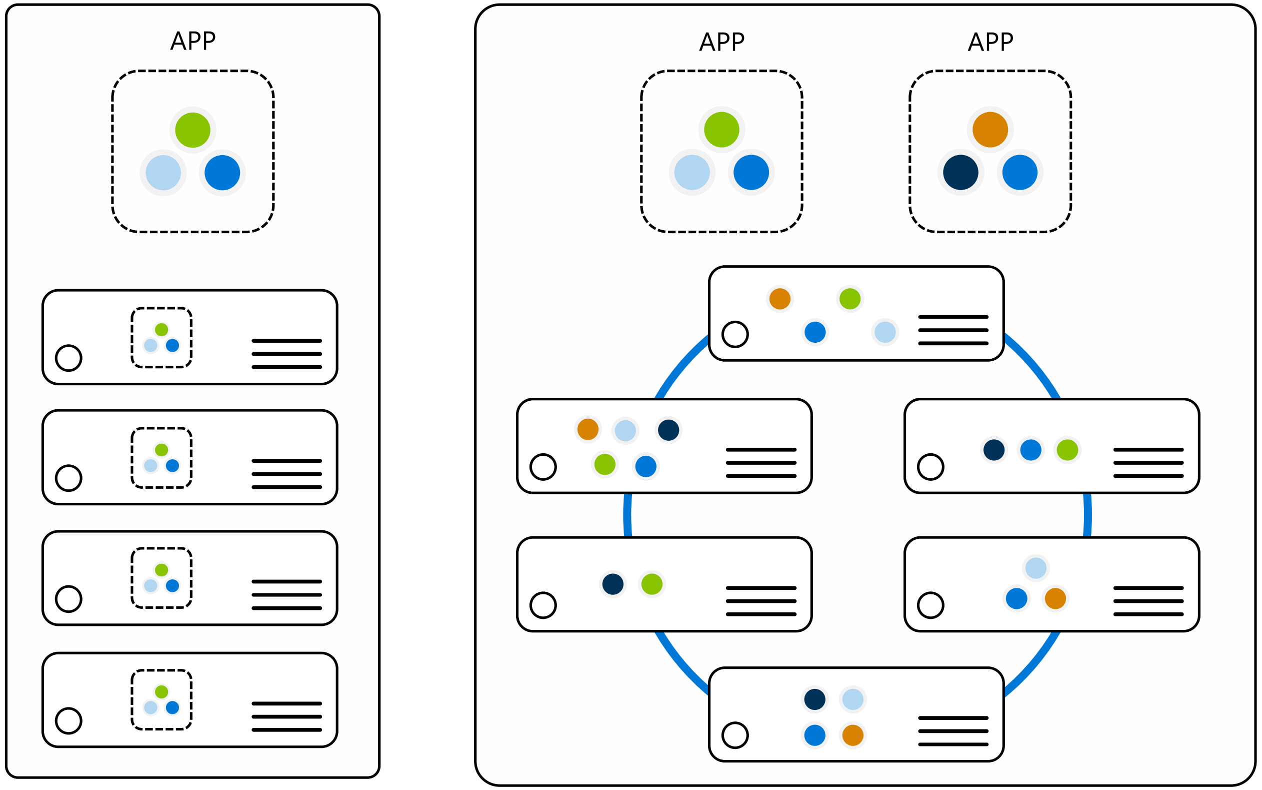


Microservices: for faster app development

- Independent deployments
- Improved scale and resource utilization per service
- Smaller, focused teams

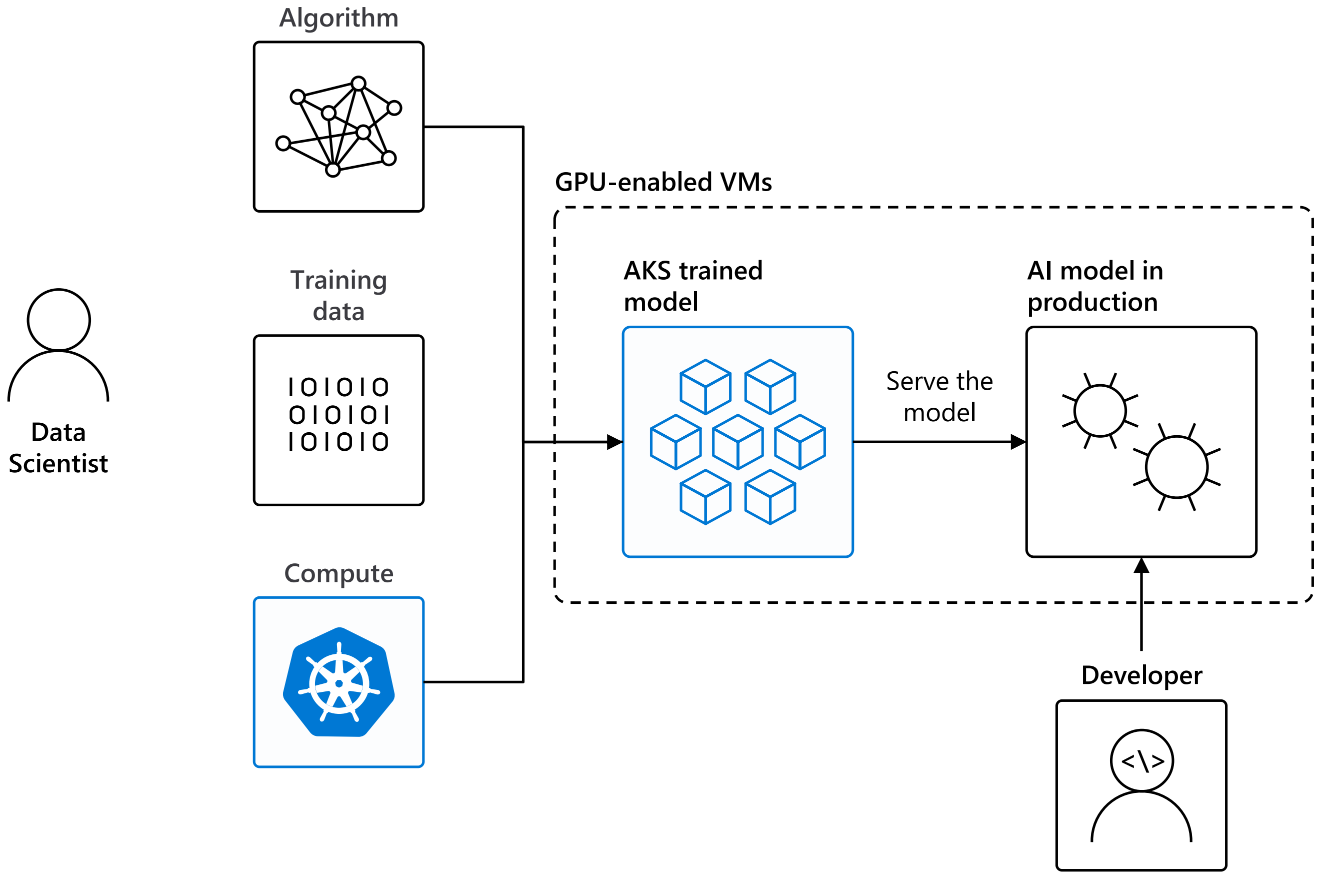
Monolithic
Large, all-inclusive app

Microservices
Small, independent services



Data scientist in a box

- Quick deployment and high availability
- Low latency data processing
- Consistent environment across test, control and production

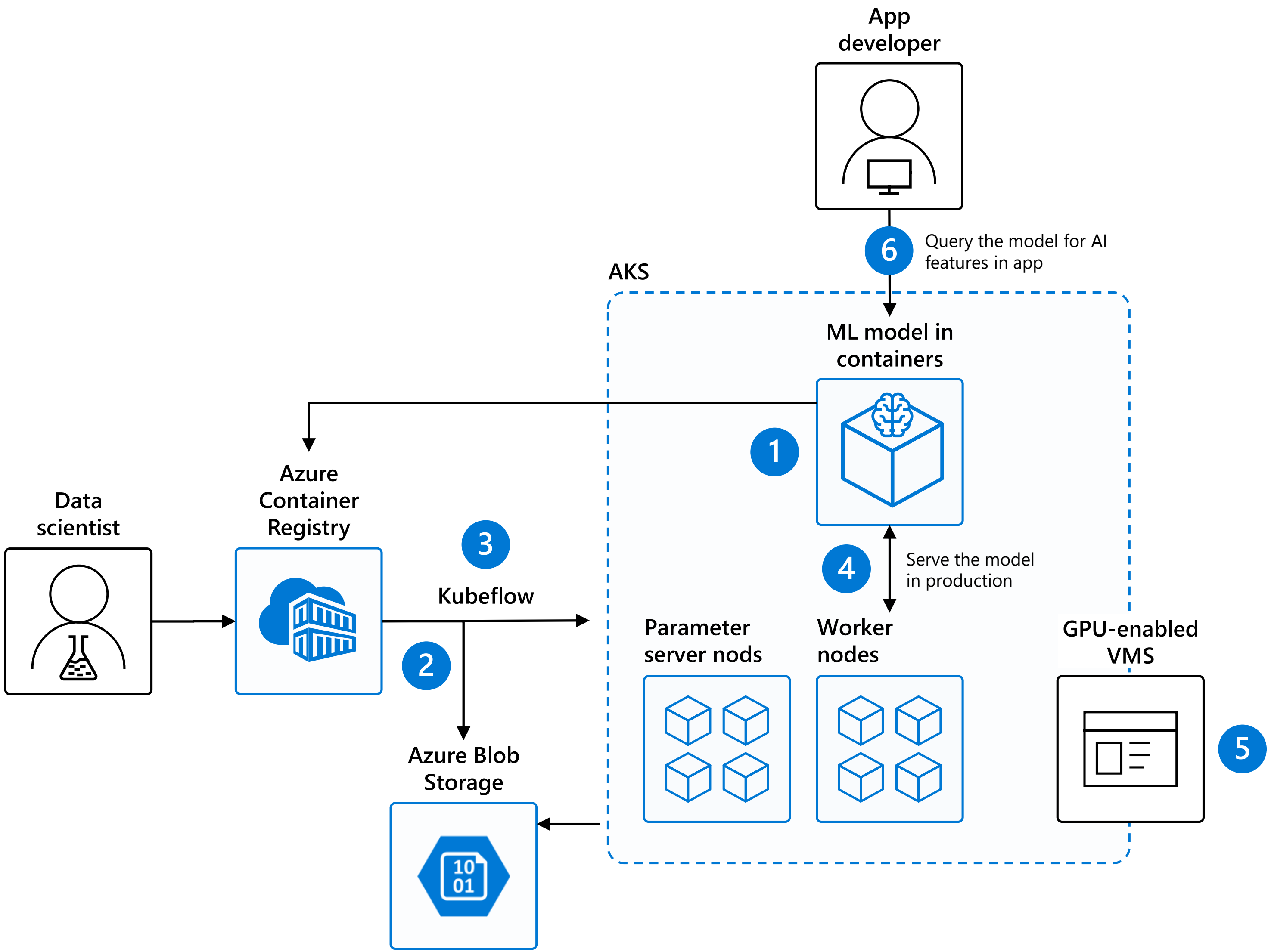


https://github.com/Azure/kubeflow-labs

Data scientist in a box

Capabilities

1. Package ML model into a container and publish to **Azure Container Registry**
2. **Azure Blob Storage** hosts training data sets and trained model
3. Use **Kubeflow** to deploy training job to AKS, distributed training job to AKS includes Parameter servers and Worker nodes
4. Serve production model using **Kubeflow**, promoting a consistent environment across test, control and production
5. AKS supports **GPU enabled VM**
6. Developer can build features querying the model running in AKS cluster



https://github.com/Azure/kubeflow-labs

Lift and shift to containers

Microservices

Machine learning

IoT

Scalable Internet of Things solutions

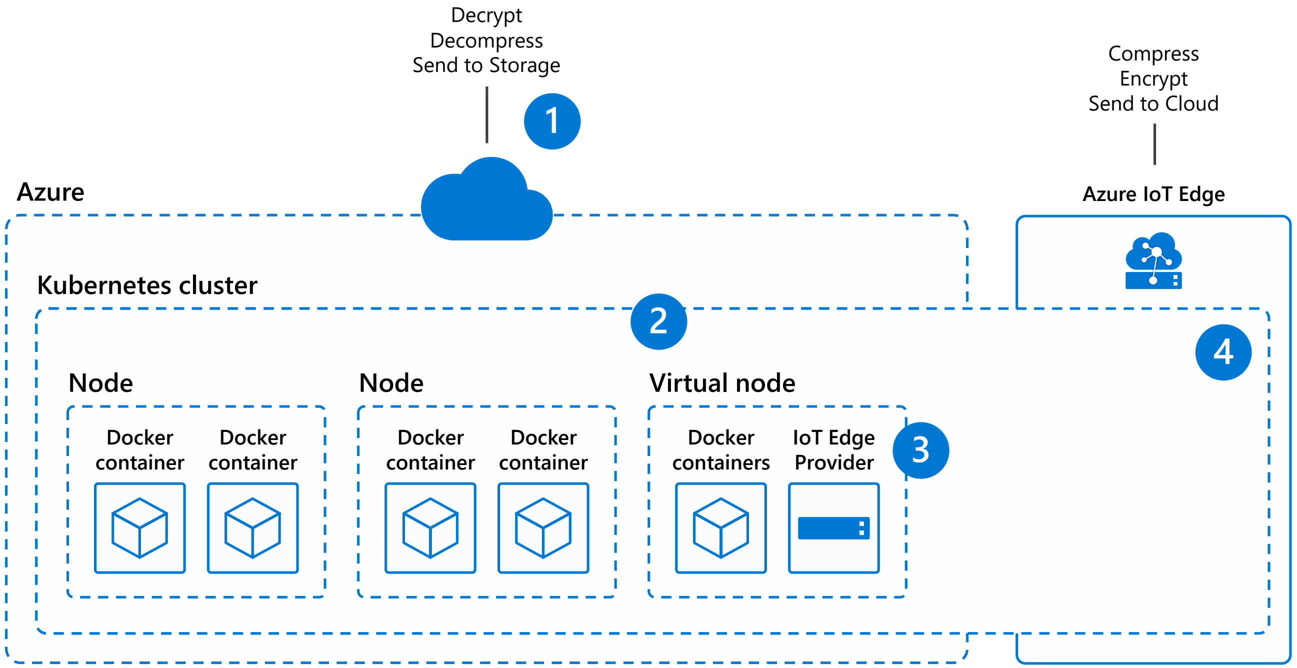
Capabilities

1. **Azure IoT Edge** encrypts data and send to Azure, which then decrypts the data and send to storage

2. **Virtual node**, an implementation of Virtual Kubelet, serves as the translator between cloud and Edge

3. **IoT Edge Provider in virtual node** redirects containers to IoT Edge and extend AKS cluster to target millions of edge devices

4. Consistent update, manage, and monitoring as one unit in AKS using single pod definition



ฟูเกียรติ จุลนวล

@fujute

http://fuju.Org

Thank you ; ขอบคุณครับ