# AKS FOR ABSOLUTE BEGINNERS

## Azure Kubernetes Service made simple


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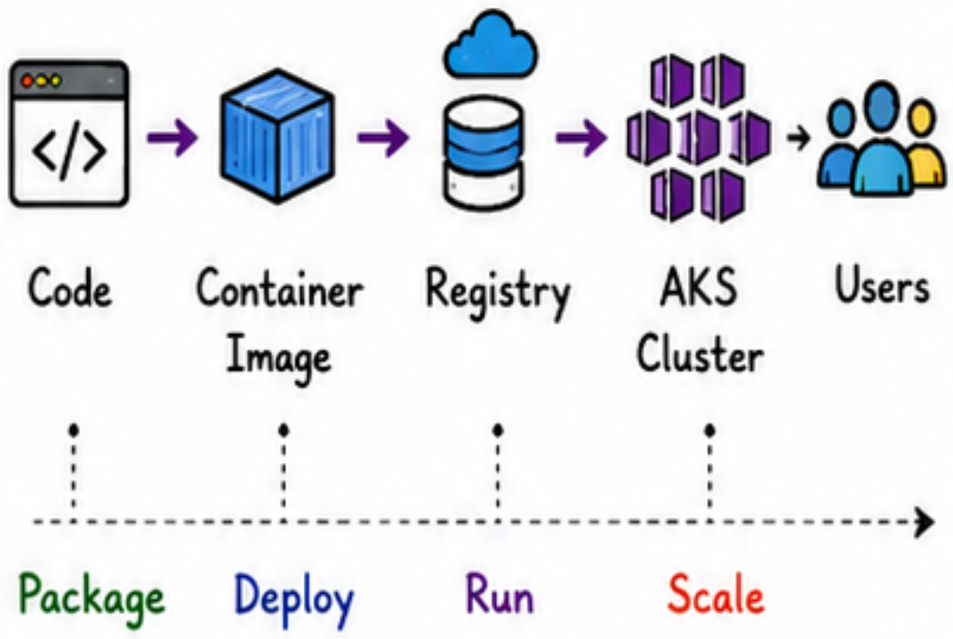
### WHAT IS AKS?

- Managed Kubernetes service on Azure.
- Run containerized apps.
- Azure manages much of the Kubernetes platform work.
- Helps with deployment, scaling, health, and upgrades.

### THE BIG PICTURE




### WHY PEOPLE USE AKS

- Consistency across environments.
- Scale up or down easily.
- Resilience and high availability.
- Faster software delivery.
- Built for modern, cloud-native apps.

### MANAGED BY AZURE VS MANAGED BY YOU

#### MANAGED BY AZURE

- Control plane (API server, etcd, scheduler, controller).
- Core platform management and operations.
- Managed upgrades and support.

#### MANAGED BY YOU

- Your apps, images, and configuration.
- Security choices and access control.
- Workloads and scaling policies.
- Operational policies and monitoring.

### TIP FOR BEGINNERS

Think of AKS as a managed apartment complex for containers.

### KEY TAKEAWAY

AKS gives you Kubernetes power without making you operate the full control plane yourself.

Keep It Simple. Design for Scale. Secure by Design. Cost Optimized.

# WHAT IS KUBERNETES?

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Kubernetes (K8s) is an open-source platform that automates deployment, scaling, and management of containerized applications.

## CORE CONCEPTS

**Pod** — The smallest deployable unit. One or more containers.

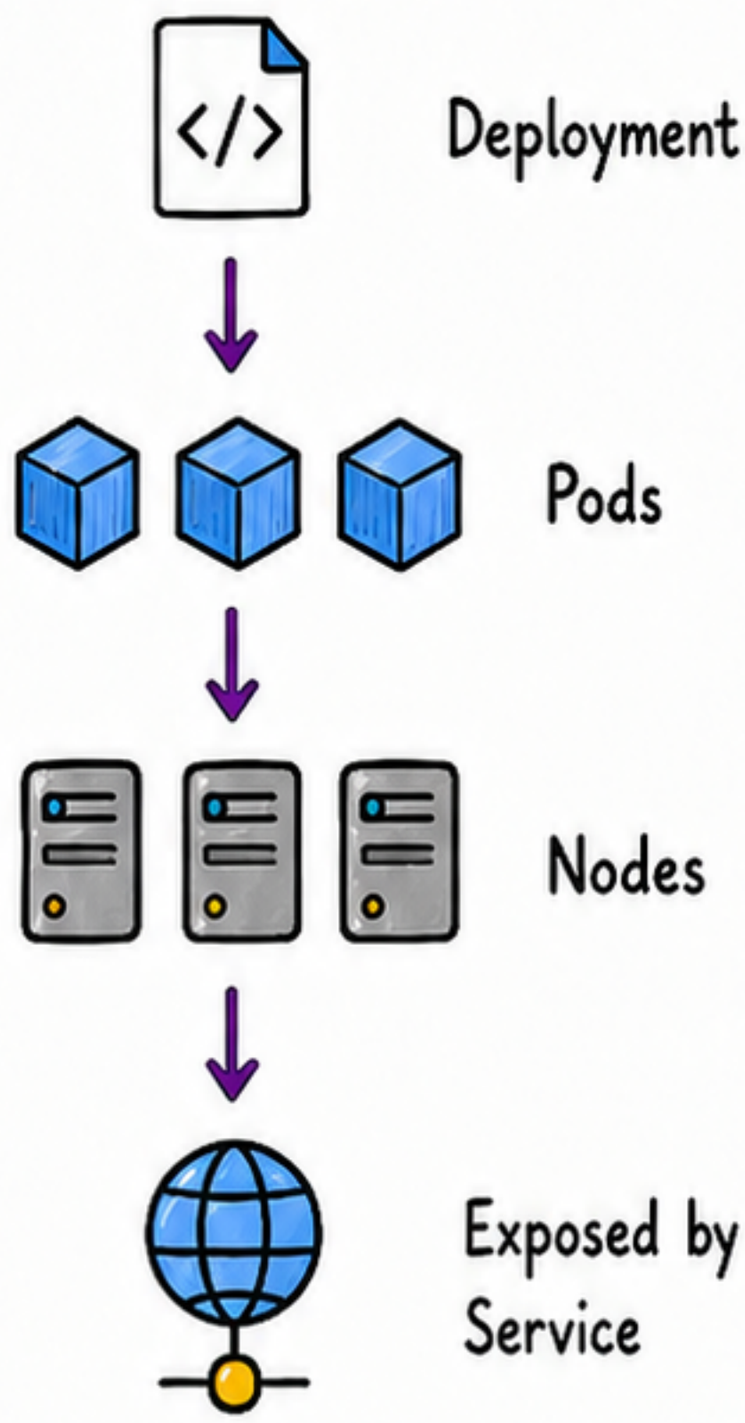
**Node** — A VM in the cluster where pods run.

**Deployment** — Manages replica sets of pods. Ensures desired state.

**Service** — Gives a stable IP/DNS and load balances traffic.

**Namespace** — A way to divide resources within a cluster.

## HOW THEY WORK TOGETHER




**TIP**

Think of Kubernetes as an operating system for your containerized applications.

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# AKS ARCHITECTURE OVERVIEW

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## AKS CONTROL PLANE (MANAGED BY AZURE)


API Server


Scheduler


Controller Manager


etcd (Database)


AKS

## YOUR AKS CLUSTER (MANAGED BY YOU)

### Node 1


Kubelet


Kube-Proxy


Pods

### Node N


Kubelet


Kube-Proxy


Pods

## INTEGRATION WITH AZURE SERVICES


Azure VNet


Azure CNI


Azure Monitor


Azure Container Registry


Azure Key Vault


**TIP** The control plane is fully managed by Microsoft. You manage your nodes, pods and applications.


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# AKS CLUSTER COMPONENTS



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## WHAT YOU GET WITH AKS

- **Control Plane (Managed)**
  Azure manages API server, scheduler, controller, etc., for high availability and security.

- **Worker Nodes**
  Run your containerized applications (pods).

- **Add-ons**
  CoreDNS, Metrics Server, Azure Monitor, etc.

- **Networking**
  Azure CNI for pod networking inside your VNet.

- **Storage**
  Integrates with Azure Disks, Files, Blob, etc.

## YOU MANAGE

- ☑ Node size & count
- ☑ Scaling your nodes
- ☑ Applications & containers
- ☑ Configuration & policies
- ☑ Monitoring & alerts
- ☑ Cost optimization

## KEY TAKEAWAY

AKS handles the complex Kubernetes control plane.
You focus on your apps and cluster configuration.

# HOW AKS WORKS?
# (LIFECYCLE)

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## LIFECYCLE STEPS

### 1. Build
Build your application and containerize it using Docker.

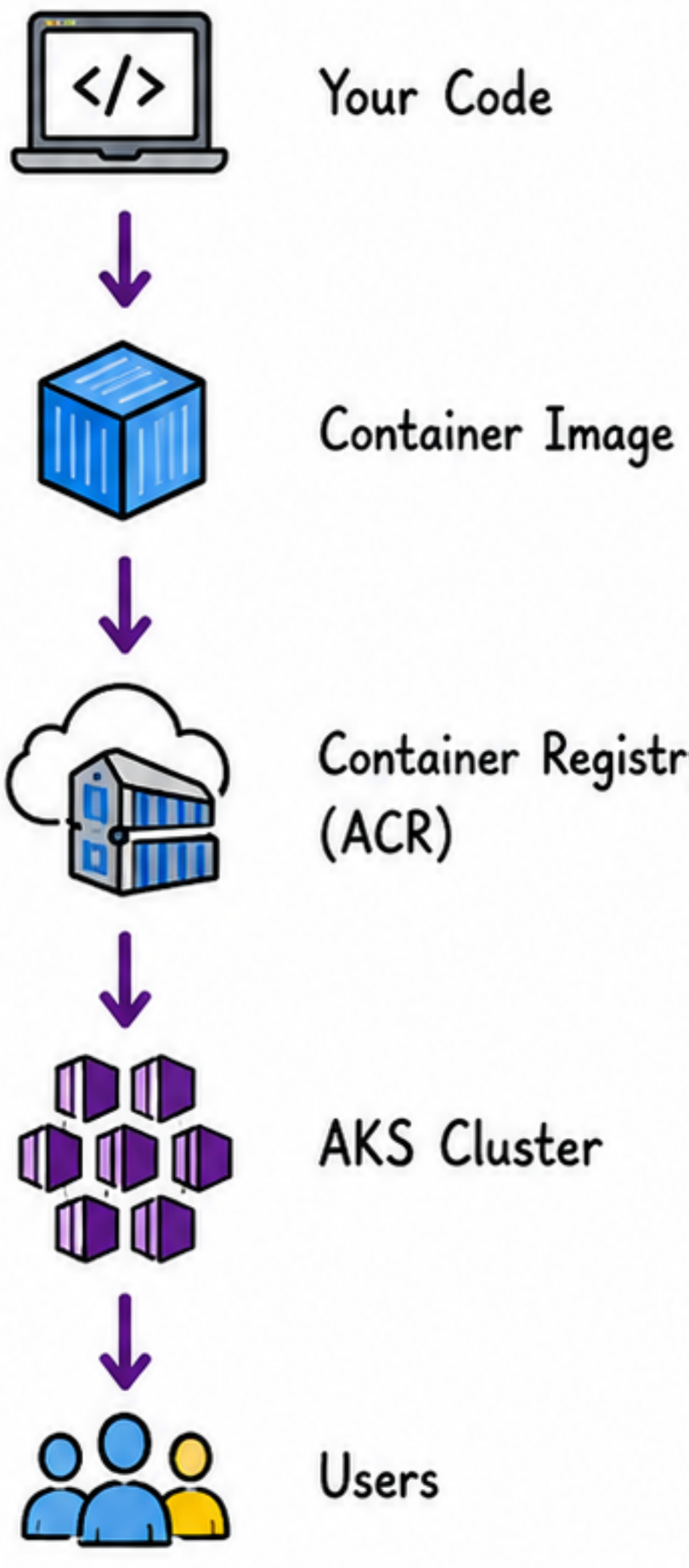
### 2. Push
Push the container image to a registry (Azure Container Registry).

### 3. Deploy
Deploy your application to AKS using kubectl, Azure CLI, or DevOps.

### 4. Run & Scale
AKS runs your app, monitors health and scales as needed.

### 5. Update
Roll out updates safely with zero-downtime deployments.

## FLOW




**TIP** AKS automates deployment, scaling and self-healing so your application stays available.

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# 6. SCALING & HIGH AVAILABILITY

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## SCALING OPTIONS

- Manual Scaling — You set node count.
- Auto Scaling (Cluster Autoscaler) — Automatically adds/removes nodes based on workload.
- Horizontal Pod Autoscaler (HPA) — Automatically adjusts the number of pod replicas based on CPU or custom metrics.

## HIGH AVAILABILITY

- Multi-zone nodes
- Control plane managed by Azure (SLA backed)
- Application self-healing
- Distribute pods across nodes and zones.

## SELF-HEALING


## KEY TAKEAWAY

AKS ensures your applications are resilient, available and can handle growth.

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# SECURITY IN AKS

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## SECURITY FEATURES

- ☑ Azure AD Integration (RBAC)
- ☑ Role-based access control
- ☑ Network isolation with VNet and Network Policies
- ☑ Encryption in transit (TLS)
- ☑ Secrets with Azure Key Vault
- ☑ Image scanning with Defender for Containers
- ☑ Pod Security Standards

## BEST PRACTICES

- ☑ Use managed identities
- ☑ Enable Azure Policy
- ☑ Keep Kubernetes version updated
- ☑ Use private clusters when needed
- ☑ Monitor with Azure Monitor & Defender
- ☑ Least privilege access

## COMPLIANCE & STANDARDS


ISO 27001


SOC 2


PCI DSS

HIPAA

Built-in security + best practices = secure and compliant workloads.

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# WHEN TO USE AKS?

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## USE AKS WHEN...

- ☑ You want to run containerized apps at scale.
- ☑ You need flexibility and control of Kubernetes.
- ☑ You want faster deployments and updates.
- ☑ You need portability across clouds or on-prem.
- ☑ You want to modernize legacy applications.

## COMMON USE CASES

- Microservices
- Web Applications
- APIs & Backends
- Batch Processing
- AI/ML Workloads
- IoT Applications

## FINAL TAKEAWAY

AKS helps you run modern applications at scale with Kubernetes power and Azure simplicity.
Focus on your code. AKS handles the rest!

**TIP** Start small, learn, iterate and scale with confidence!

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