

50 days from zero to hero with Kubernetes

Kubernetes is taking the app development world by storm. By 2022, more than 75% of global organizations will be running containerized applications in production.¹ Kubernetes is shaping the future of app development and management—and Microsoft wants to help you get started with it today.

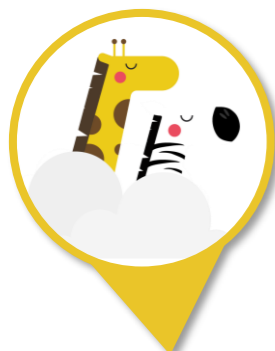
This guide is meant for anyone interested in learning more about Kubernetes. In just 50 days, you'll understand the basics of Kubernetes and get hands-on experience with its various components, capabilities, and solutions, including Azure Kubernetes Service. Go from zero to hero with Kubernetes to set your company up for future app development success.



50 days from zero to hero with Kubernetes



Click the bubbles to access that resource



Day 1 A Kubernetes Story: Phippy Goes to the Zoo

Tag along with Phippy and Zee for an educational adventure about Kubernetes. *6 minutes.*



Day 6-15 Azure Kubernetes Service core concepts

Learn about the core concepts of AKS, like infrastructure components and access, in six short articles. *45 minutes.*



Day 21-28 Architectures and patterns

Learn the basics of designing microservices apps, AI apps, and distributed systems in a pair of illustrative articles and an eBook from Brendan Burns. *27 minutes; 160 pages.*



Day 33-50 Operational best practices for Kubernetes

With an eBook from Brendan Burns, a series of 11 articles, and one webinar, go beyond Day 1 with best practices for Day 2 operations. *277-page eBook; 65 minutes to read; 64 minutes to watch.*

Zero



Day 2-5 Kubernetes basics video series with Brendan Burns

Build a strong Kubernetes foundation in these 18 videos led by Kubernetes cofounder Brendan Burns. *115 minutes.*



Day 16-20 Technical, on-demand Kubernetes webinars

Take a deep dive into Kubernetes with eight on-demand webinars from expert engineers, product managers, and developers. *462 minutes.*



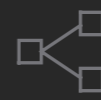
Day 29-32 Workshop: Deploy a multi-container application

Get step-by-step training for creating a Kubernetes cluster, setting up a CI/CD pipeline using AKS, and more in this hands-on learning experience. *1 workshop.*

Hero



Step 1



Day 1

A Kubernetes Story: Phippy Goes to the Zoo

Tag along with Phippy the giraffe and her niece, Zee the zebra, as they explore various components of Kubernetes, from pods to deployments, in this fun, lighthearted, educational adventure.

[Click to read the story](#)

6 minutes



Click [here](#) to go back to the learning path



Step 2



Day 2-5

Kubernetes basics video series

Join Kubernetes cofounder Brendan Burns for a series of lightboard video demonstrations that answer your general Kubernetes questions. Throughout the series, Brendan teaches you about containers, components, deployments, the scheduler, and more.

[Click for video series playlist](#)

18 videos = 115 minutes, 21 seconds

[Click for Kubernetes intro](#)

1 video = 6 minutes, 28 seconds | 1 article = 3 minutes





Step 2



Click the box to watch the video

Why you should care about containers

Utilize underlying resources more efficiently with this lightweight, immutable infrastructure for application deployment

6 minutes, 29 seconds

Understand serverless with Kubernetes

Learn the difference between serverless Kubernetes and serverless on Kubernetes

7 minutes, 54 seconds

Overview of common Kubernetes scenarios

Use Kubernetes for purposes beyond microservice delivery, such as batch analytics and workflows

3 minutes, 43 seconds

How Kubernetes works

Get to know key components including pods, deployments, replica sets, and the scheduler

5 minutes, 35 seconds

How the Kubernetes scheduler works

See how scheduler uses predicates or hard constraints and priorities or soft constraints to make decisions

7 minutes, 35 seconds

How volumes and storage work in Kubernetes

Find out about emptyDir, persistent volume, and persistent volume claim

5 minutes, 40 seconds

How Kubernetes deployments work

Upgrade applications running in a Kubernetes cluster reliably and with zero downtime

6 minutes, 35 seconds

Setting up a Kubernetes build pipeline

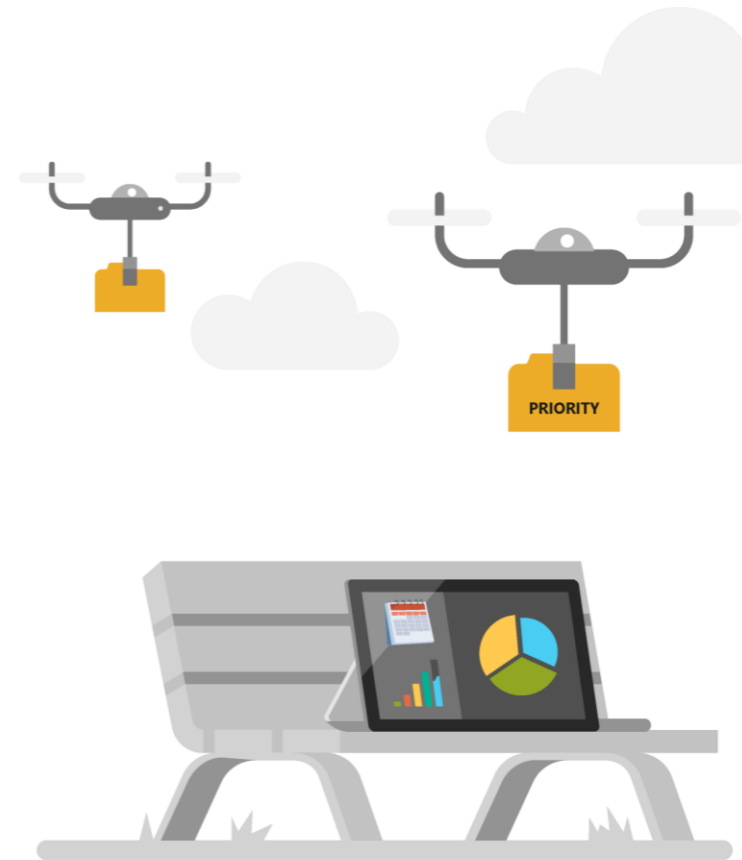
Watch a demonstration of security and associated checks and balances

6 minutes, 25 seconds

The basics of stateful applications in Kubernetes

Understand the role that replica sets, persistent volumes, and persistent volume claims play in stateful app development

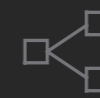
7 minutes, 6 seconds



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Step 2



Click the box to watch the video

Understand secrets management in Kubernetes

Securely deploy and manage sensitive information such as passwords and certificates

5 minutes, 5 seconds

Getting production ready in Kubernetes

Put Kubernetes services into production, plus see why CI/CD, monitoring, and failover planning are important

5 minutes, 44 seconds

Getting started with monitoring and alerting

Set up and customize alerts and monitoring for apps, and integrate metrics to operate apps more reliably

7 minutes, 6 seconds

How Kubernetes and config management work

Learn management practices and topics like ConfigMaps, rollout of configurations, and templating

6 minutes, 53 seconds

How service meshes work in Kubernetes

Get a quick overview of services meshes, what they provide, and why you would want one in your application

6 minutes, 21 seconds

How pods and the pod lifecycle work in Kubernetes

Understand what happens when you create a pod—the atomic unit of scheduling

7 minutes, 47 seconds

Understand role-based access control in Kubernetes

Ensure that people working on a project don't interfere with each other's work by setting up a proper RBAC system

7 minutes, 14 seconds

Simple app management on Kubernetes with operators

Adopt a cloud-native paradigm for managing apps in clusters and simplify management with core operator concepts

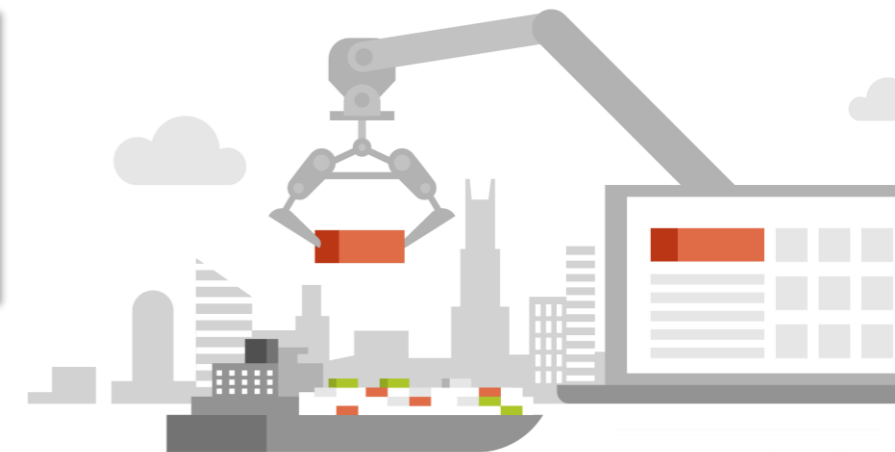
5 minutes, 40 seconds

Customizing, extending API with admission controllers

Add new and unique capabilities to your cluster by modifying how API objects are validated or created

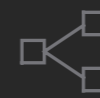
6 minutes, 22 seconds

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Step 3



Day 6-15

Azure Kubernetes Service core concepts

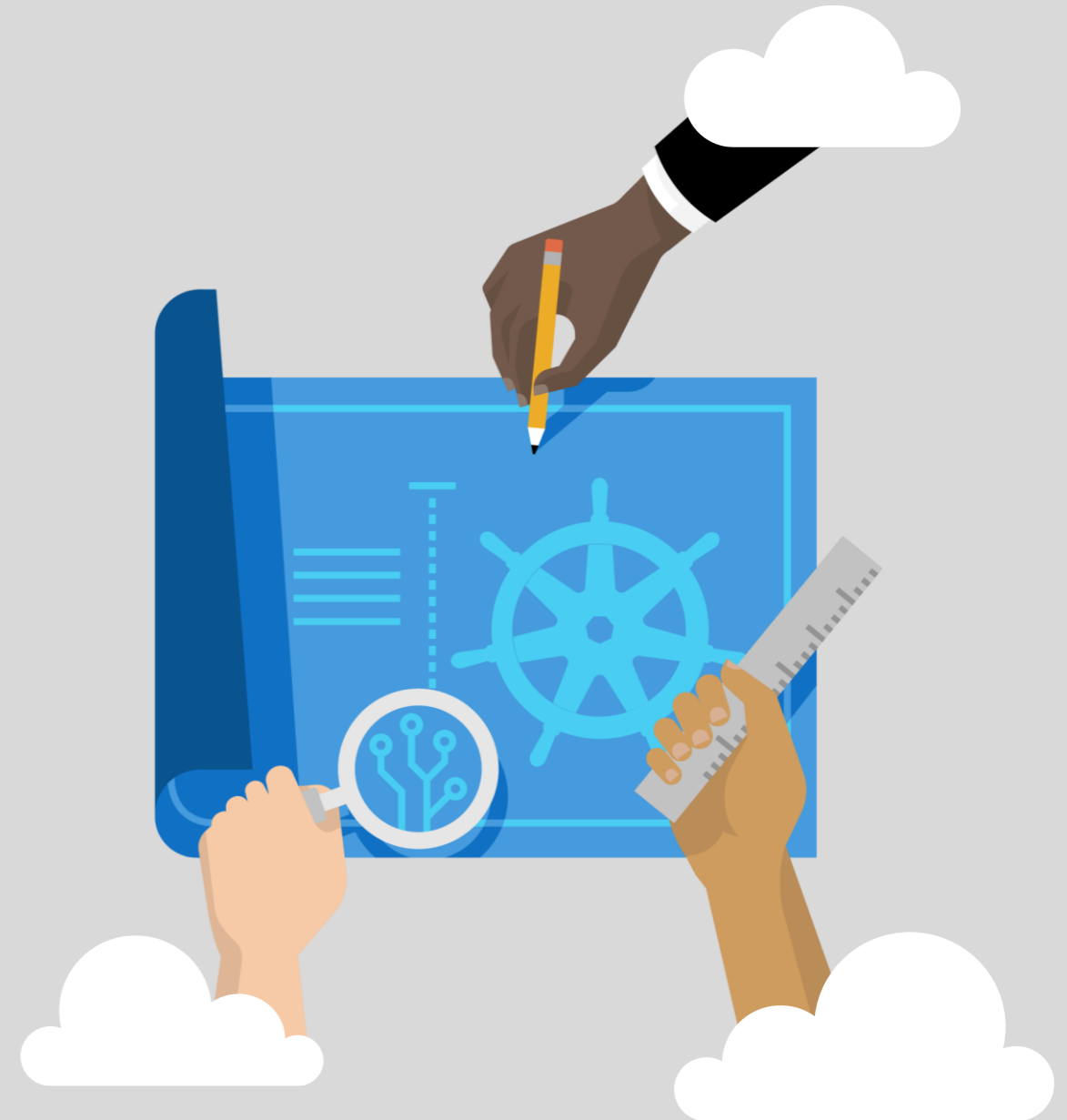
Learn how infrastructure components, access and identity, security, network, storage, and scaling function in AKS in these technical articles. Each article covers a specific topic and only takes a few minutes to read, so you can understand the basics of Kubernetes in no time.

[Click for access to all articles](#)

6 articles = 45 minutes

[Click for introductory module](#)

6 module units = 25 minutes





Step 3

Click the box to read the article

Clusters and workloads

See how infrastructure components like the control plane, nodes, and node pools work in AKS—along with workload resources like pods and sets

15 minutes

Network concepts for apps

Provide networking to your applications in AKS, including services, Azure virtual networks, ingress controllers, and network policies

9 minutes

Access and identity

Authenticate and assign permissions in AKS using Kubernetes service accounts, AAD integration, role-based access control, Roles and ClusterRoles, and RoleBindings and ClusterRoleBindings

4 minutes

Storage options for apps

Store applications in AKS using volumes, persistent volumes, storage classes, and persistent volume chains

6 minutes

App and cluster security

Safeguard your applications in AKS with master components security, node security, cluster upgrades, network security, and Kubernetes secrets

5 minutes

Scaling options for apps

Scale applications in AKS using manual scale, horizontal pod autoscaler (HPA), cluster autoscaler, and Azure Container Instance (ACI) integration

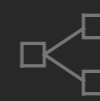
6 minutes



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Step 4



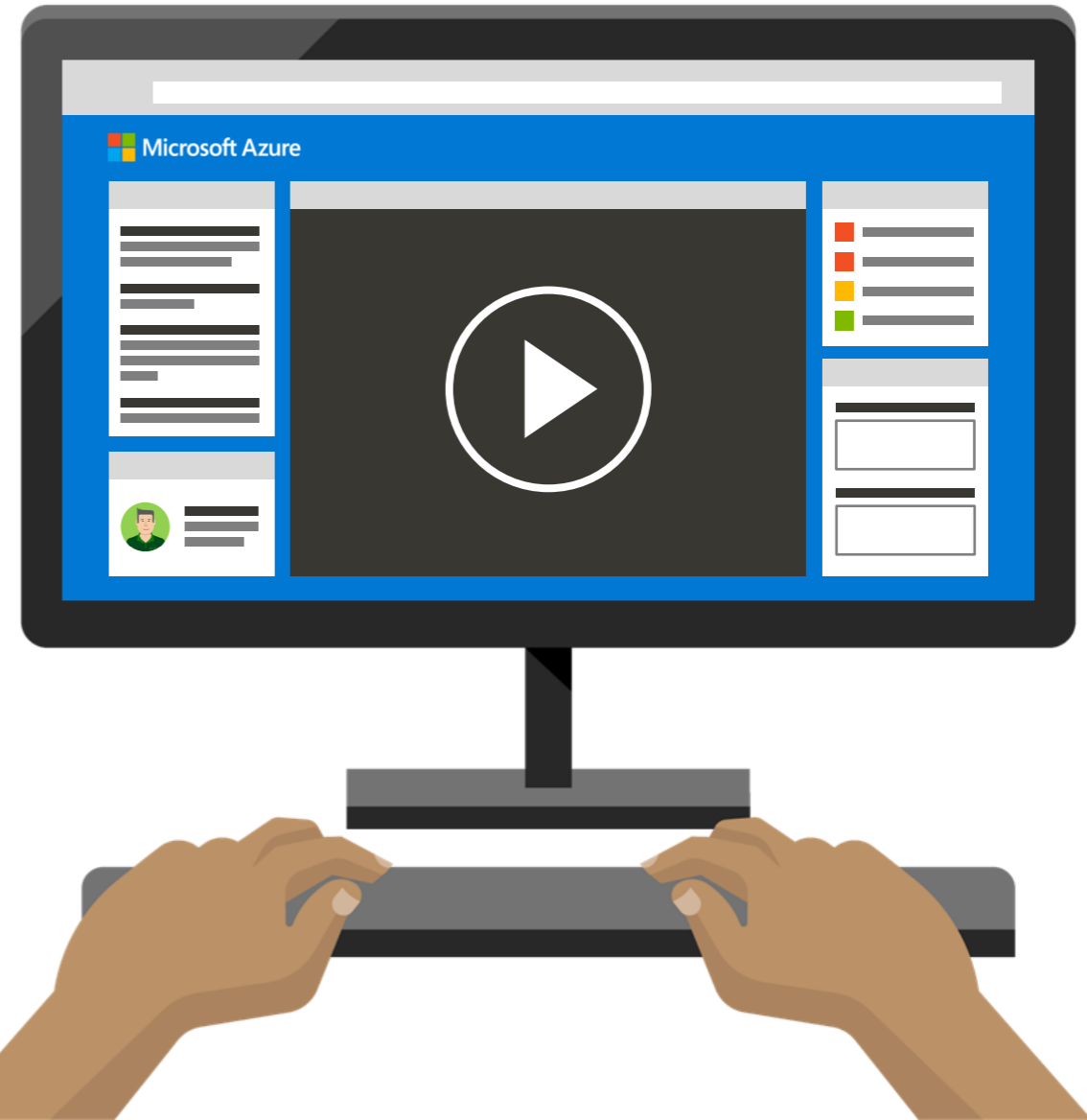
Day 16-20

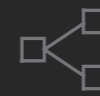
Kubernetes training webinars

Take a deep dive into specific Kubernetes use cases in these technical, on-demand webinars led by distinguished engineers, program managers, and developers. Plus, hear answers to real-life questions from others who are learning and applying Kubernetes.

8 webinars = 462 minutes

Click [here](#) to go back to the learning path





Step 4

Click the box to watch the webinar

Get Kubernetes up and running

See where to begin and find out how to simplify day-to-day operations with a managed Kubernetes service

50 minutes

Apply best practices for cluster management

Learn about multi-tenancy, logical isolation with namespaces, and cluster and image security to use AKS optimally

60 minutes

Manage microservices with Azure API Management

Get comprehensive examples and learn when and why to use API Management in your organization

60 minutes

Kubernetes anywhere with Azure Arc Preview

Manage, govern, and secure your Kubernetes clusters across on-premises, edge, and cloud environments

50 minutes

Project design and layout for successful Kubernetes apps

Prepare your application for Kubernetes and organize for a weekly or daily release following these file system layouts

64 minutes

Build event-driven containers with Azure Functions

Take advantage of events on any cloud-native application with these architectures, patterns, and best practices

60 minutes

Secure Kubernetes clusters

Keep your AKS cluster running with the latest OS security updates and Kubernetes releases as well as secure pod traffic and access to sensitive credentials

58 minutes

Manage Kubernetes clusters with built-in best practices

Learn how Azure solutions can identify potential issues and provide actionable recommendations for your clusters

60 minutes



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Step 5

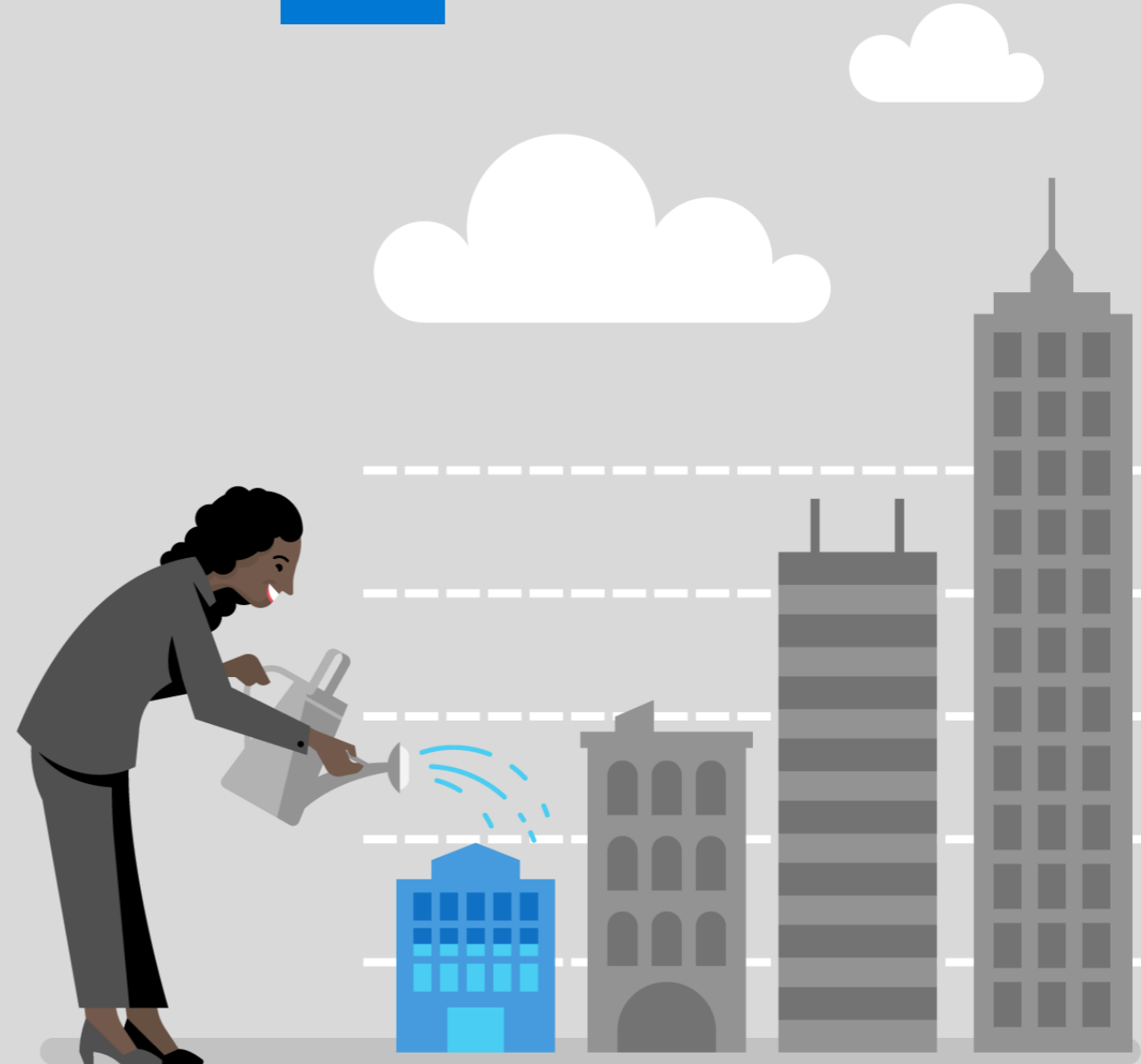
Day 21-28

Architectures and patterns

Learn the basics of designing microservices applications and AI applications using machine learning operations (MLOPs)—complete with architecture diagrams—in a pair of short articles. Then, check out an eBook from Brendan Burns for building reliable, efficient distributed systems.

[Click for deployment strategies](#)

1 article = 3 minutes | 1 video = 6 minutes, 35 seconds



Click [here](#) to go back to the learning path



Step 5

Click the box to read the article or eBook

Microservices applications

See how infrastructure components like the control plane, nodes, and node pools —along with workload resources like pods and sets—work in AKS

19 minutes

AI applications with MLOps

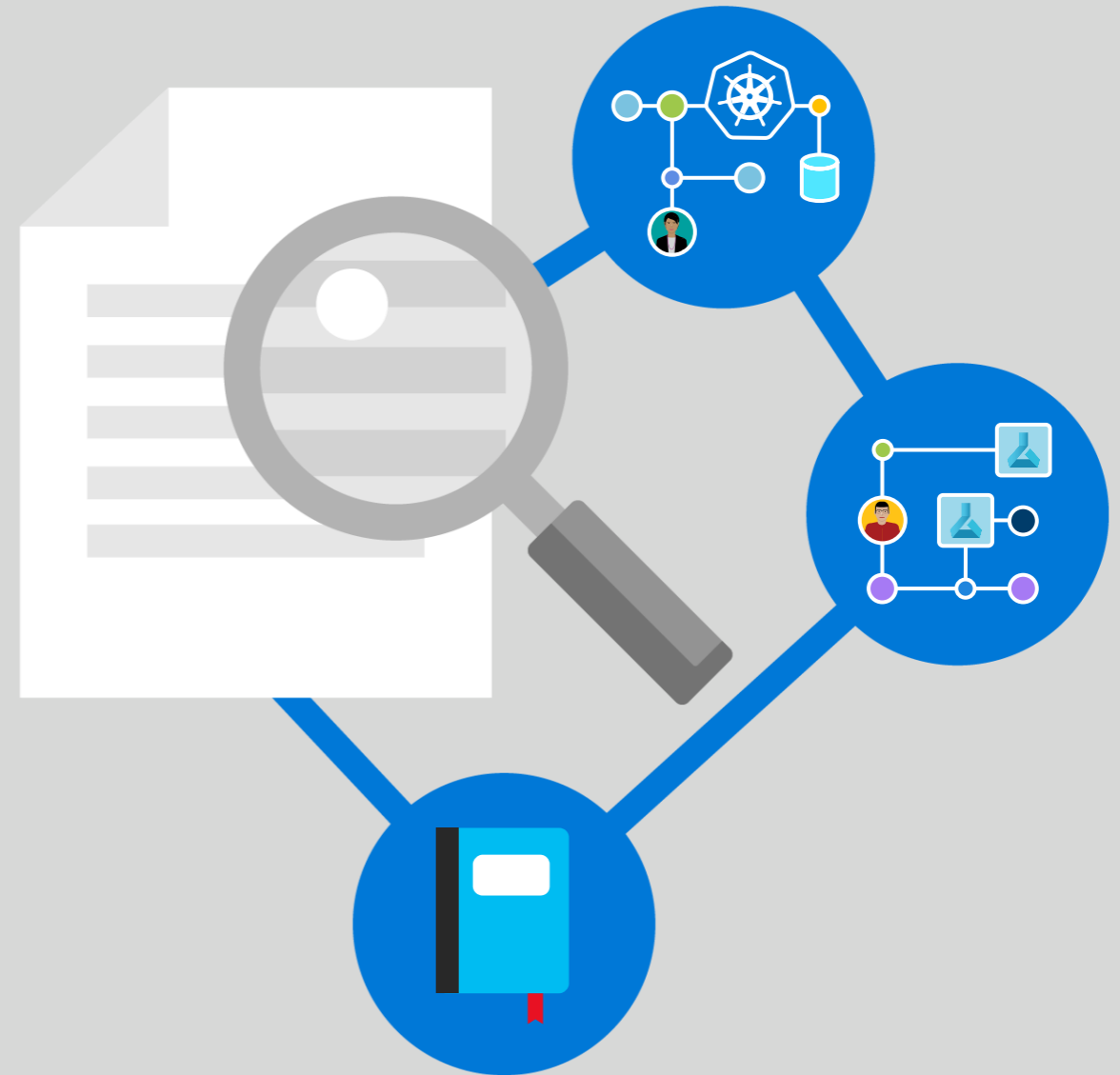
Implement a continuous integration and continuous delivery (CI/CD) and retraining pipeline for an AI application using Azure DevOps and Azure Machine Learning

8 minutes

Distributed systems eBook

Understand the repeatable, generic patterns and reusable components that make developing distributed systems easier, so you can free up your time to focus on more strategic initiatives

160 pages



Click [here](#) to go back to the learning path



Step 6

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Day 29-32

Workshop: Deploy a multi-container application

Get step-by-step training for creating a Kubernetes cluster, deploying a microservices-based application, and setting up a CI/CD pipeline using AKS in this hands-on learning experience.

[Click to access](#)

11 workshop modules = 145 minutes





Step 7



Day 33-50

Operational best practices for Kubernetes

Go beyond Day 1 with best practices for Day 2 operations. Start with an eBook from Brendan Burns to review practical Kubernetes deployment skills, then dive into best practices, from network security to creating a CI/CD pipeline, collected from real-world deployments of Kubernetes and written by subject matter experts.

[Click for eBook](#)

277 pages

[Click for all best practices](#)

11 articles = 65 minutes | 1 webinar = 64 minutes

Click [here](#) to go back to the learning path





Click the box to read the article

Cluster isolation

- Plan for multi-tenant clusters and separation of resources
- Use logical or physical isolation in your AKS clusters

3 minutes

Authentication, authorization

- Authenticate cluster users with AAD
- Control access to resources with RBAC
- Use a managed identity to authenticate themselves with other services

6 minutes

Basic scheduler features

- Provide a fixed amount of resources
- Limit impact of scheduled maintenance
- Check for missing pod resource requests and limits

5 minutes

Cluster security, upgrades

- Secure API server access and container access to resources
- Upgrade an AKS cluster and keep nodes up to date

9 minutes

Advanced scheduler features

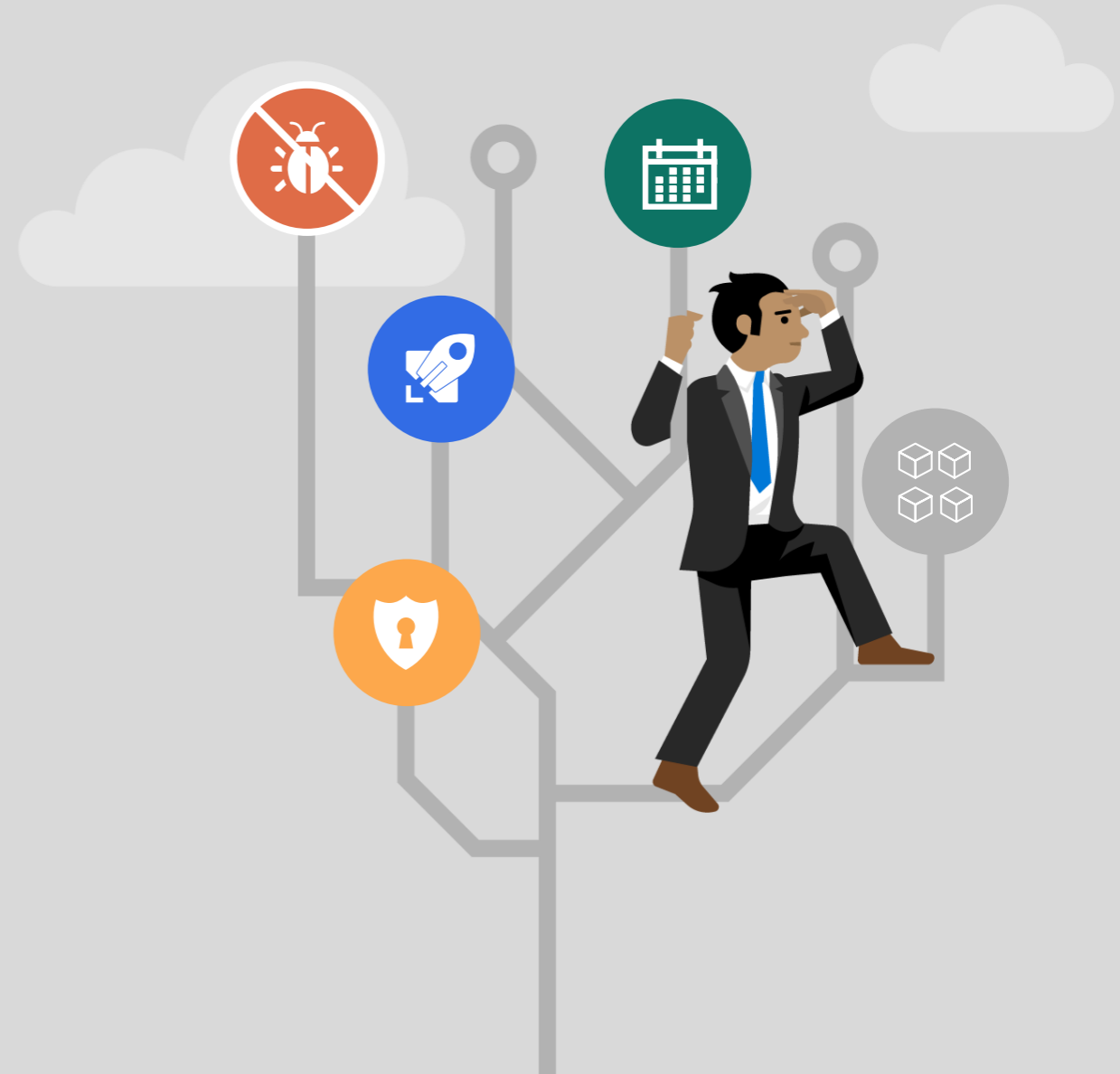
- Use taints and tolerations to limit pods
- Give preference to pods to run on certain nodes
- Split apart or group pods together

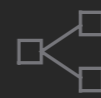
7 minutes

Container security

- Scan for and remediate image vulnerabilities
- Trigger and redeploy container images when a base image is updated

2 minutes





Click the box to read the article

Network connectivity

- Compare network models
- Plan for IP addressing, connectivity
- Distribute traffic using load balancers, ingress controllers, or a WAF

9 minutes

Resource management

for developers

- Understand resource requests, limits
- Learn ways to develop and deploy applications with Dev Spaces, VS Code
- How to use the kube-advisor tool

6 minutes

Storage and backups

- Determine what storage is available
- Correctly size AKS nodes for storage performance
- Learn to back up, secure data volumes

6 minutes

Pod security

for developers

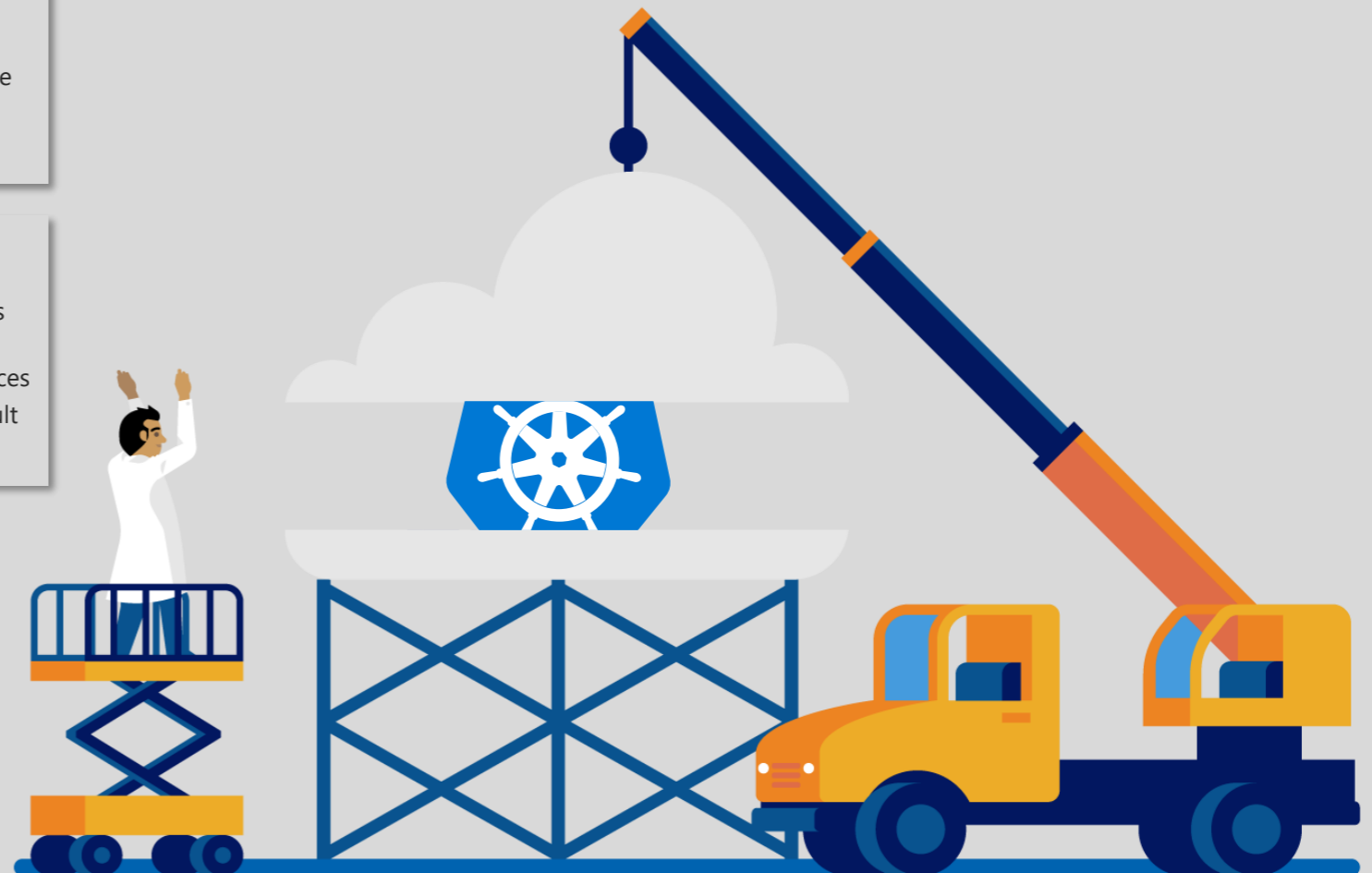
- Limit access to processes and services using pod security context
- Authenticate with other Azure resources
- Retrieve credentials from a digital vault

5 minutes

Business continuity

- Plan for AKS clusters in multiple regions
- Route traffic across multiple clusters
- Use geo-replication for image registries
- Replicate storage across regions

7 minutes



Click [here](#) to go back to the learning path

Looking for more?

What is Kubernetes?

Get the Kubernetes basics, from how it works to why you should use it

What is a container?

Learn why you should care about containers, complete with use cases

Kubernetes on Azure

Read about Microsoft's approach to Kubernetes

Free trial

Get 12 free months of Azure services, including Azure Kubernetes Service

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