Microsoft

Kubernetes Learning Path | Version 2.0

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.

[1]Gartner. "6 Best Practices for Creating a Container Platform Strategy." April 23, 2019.

50 days from zero to hero with Kubernetes

Click the bubbles to access that resource

Microsoft Azure

Day 1
A Kubernetes Story: Phippy Goes to the Zoo

Tag along with Phippy and Zee as Phippy explains the basics of 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. *41 minutes.*

Day 21-25
Microservices architecture design

Learn about the infrastructure and DevOps considerations involved in running a microservices architecture on Azure Kubernetes Service via this article. *21 minutes.*

Day 28-32
Distributed system patterns and practices

Download this complimentary e-book and learn how to develop reliable distributed systems more easily and efficiently. *Free e-book.*

Zero

Hero

Day 2-5
Kubernetes basics: video series with Brendan Burns

Join Kubernetes co-founder Brendan Burns for 18 short videos that answer your general Kubernetes questions. *82 minutes.*

Day 16-20
Explore Kubernetes with Katacoda
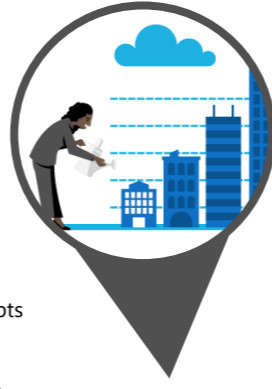
Explore essential tools and capabilities of Kubernetes in these 10 interactive Katacoda training modules. *120-19 minutes.*

Day 26-27
Azure Kubernetes Service workshop

Go through a step-by-step workshop to learn how to create a Kubernetes cluster, set up a CI/CD pipeline, and more. *1 workshop.*

Day 33-50
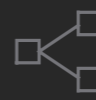**Operational best practices for Kubernetes**

With an eBook from Brendan Burns, a series of 11 articles, and one webinar developed by subject matter experts, go beyond Day 1 with best practices for Day 2 operations. *277-page eBook; 61 minutes to read; 64 minutes to watch.*

Day 1

A Kubernetes Story: Phippy Goes to the Zoo

Tag along with Phippy and her niece, Zee, as they explore various components of Kubernetes, from pods to deployments, in this fun, illustrative children's book.

Click here to read

6 minutes

Day 2-5

Video series with Brendan Burns

Join Kubernetes co-founder Brendan Burns for a series of videos that answer your general Kubernetes questions. Through the series, Brendan teaches you about containers, Kubernetes and its components, deployments, Kubernetes scheduler, and more.

Click here to watch

18 videos, 115 minutes

Click icon to get back to the learning path

Why you should care about containers

Containers have taken the world by storm! Join Brendan as he illustrates how containers provide a lightweight, immutable infrastructure for application deployment and help you utilize underlying resources more efficiently.

Click here to watch

6 minutes, 29 seconds

How Kubernetes works

Join Brendan as he walks you through key Kubernetes components, including pods, deployments, replica sets, scheduler, and load balancer.

Click here to watch

5 minutes, 35 seconds

How Kubernetes deployments work

Watch as Brendan illustrates how deployments in Kubernetes allow for reliable, zero-downtime upgrades of your applications running inside a Kubernetes cluster.

Click here to watch

6 minutes, 35 seconds

Understand serverless with Kubernetes

Brendan explains the difference between serverless Kubernetes and serverless on Kubernetes.

Click here to watch

7 minutes, 54 seconds

How the Kubernetes scheduler works

In this video, Brendan shows you how the Kubernetes scheduler uses predicates (hard constraints) and priorities (soft constraints) in scheduler decision-making.
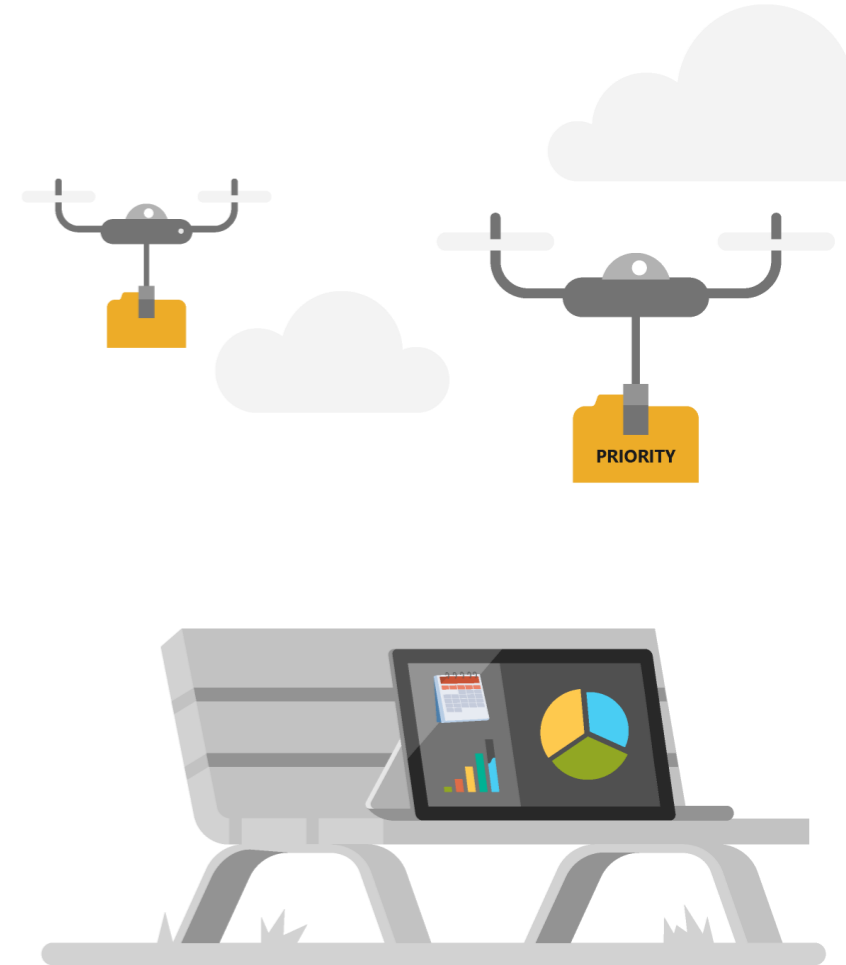
Click here to watch

7 minutes, 35 seconds

Setting up a Kubernetes build pipeline

Watch as Brendan demonstrates how security and associated checks and balances play a key role in setting up a Kubernetes build pipeline.

Click here to watch

6 minutes, 25 seconds

PRIORITY

Click icon to get back to the learning path

Overview of common Kubernetes scenarios

Click here to watch

3 minutes, 43 seconds

How Kubernetes and configuration management works

Click here to watch

6 minutes, 53 seconds

Simple application management on Kubernetes with operators

Click here to watch

5 minutes, 40 seconds

How pods and pod lifecycle work in Kubernetes

Click here to watch

7 minutes, 47 seconds

How volumes and storage work in Kubernetes

Click here to watch

5 minutes, 40 seconds

Understand role-based access control in Kubernetes

Click here to watch

7 minutes, 14 seconds

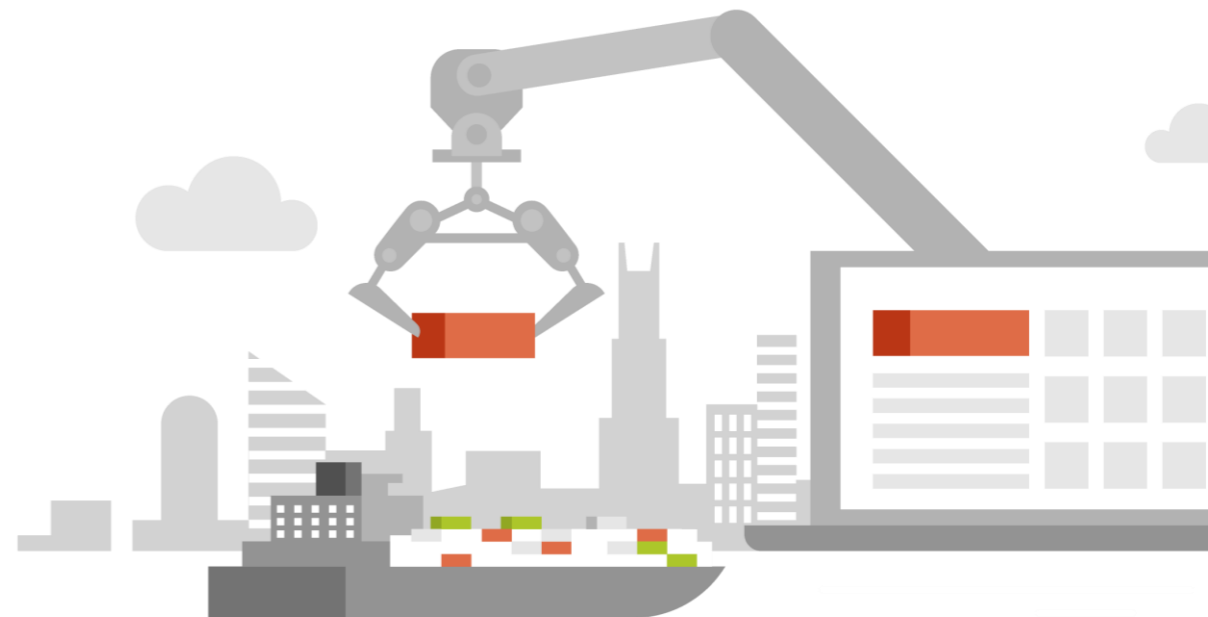## Getting started with monitoring and alerting for Kubernetes

Click here to watch

7 minutes, 6 seconds

Customizing, extending Kubernetes API with admission controllers

Click here to watch

6 minutes, 22 seconds

The basics of stateful applications in Kubernetes

Click here to watch

7 minutes, 6 seconds

Getting production ready in Kubernetes

Click here to watch

5 minutes, 44 seconds

Understand secrets management in Kubernetes

Click here to watch

5 minutes, 5 second

How service meshes work in Kubernetes

Click here to watch

6 minutes, 21 seconds

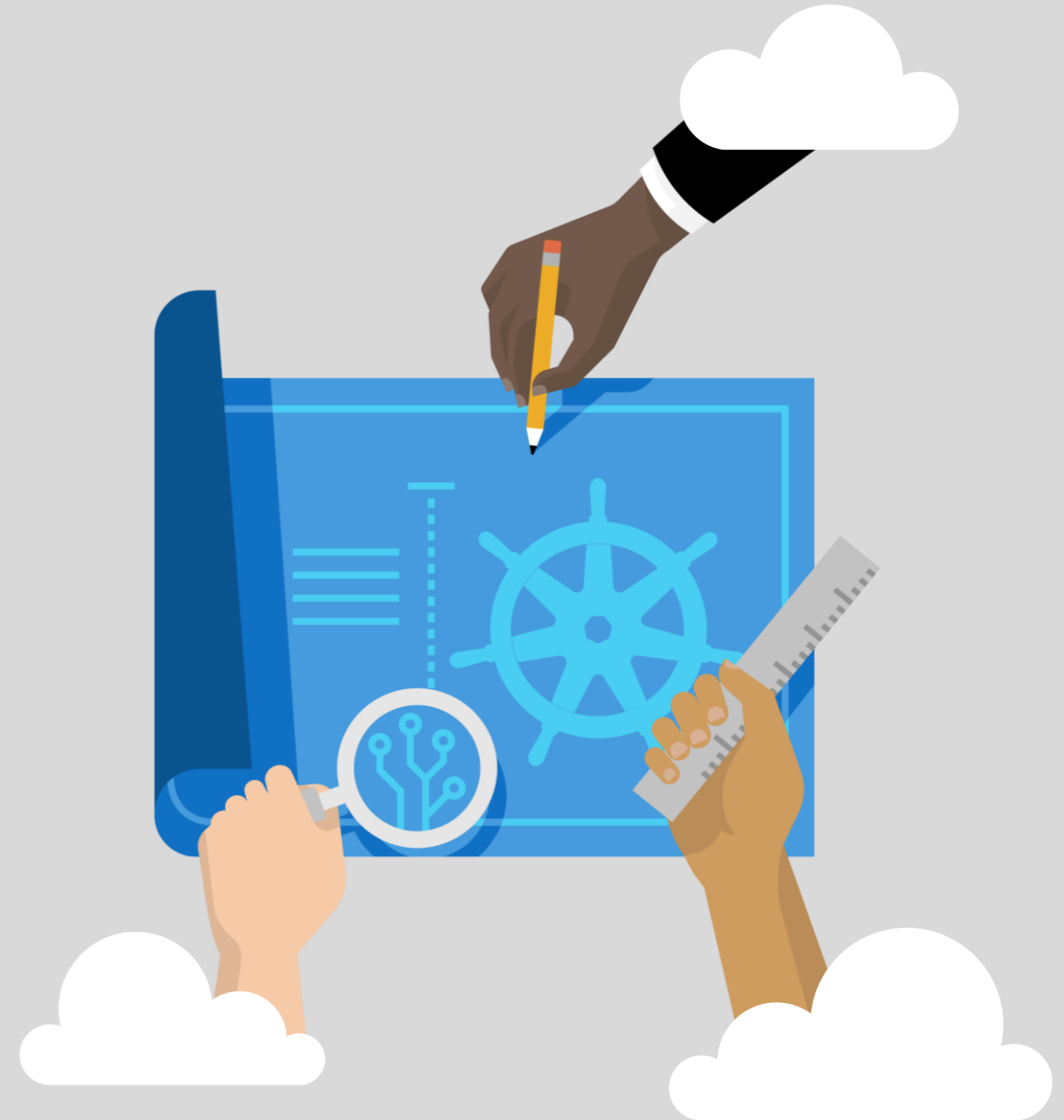Click icon to get back to the learning path

Day 6-15

Azure Kubernetes Service core concepts

Learn about Azure Kubernetes Service (AKS) core concepts, including infrastructure components, access and identity, security, network, storage, and scaling. 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 here to read

6 articles, 41 minutes

Access and identity options

Learn how to authenticate and assign permissions in AKS with core concepts like Kubernetes service accounts, Azure Active Directory integration, role-based access control, Roles and ClusterRoles, and RoleBindings and ClusterRoleBindings.

Click here to read

4 minutes

Application and cluster security concepts

Read about the core concepts that secure your applications in AKS, including master components security, node security, cluster upgrades, network security, and Kubernetes Secrets.

Click here to read

5 minutes

Network concepts for applications

Understand the core concepts that provide networking to your applications in AKS, including Services, Azure virtual networks, Ingress controllers, and network policies.

Click here to read

7 minutes

Scaling options for applications

Learn about the core concepts that help you scale applications in AKS, including manual scale, horizontal pod autoscaler (HPA), cluster autoscaler, and Azure Container Instance (ACI) integration with AKS.

Click here to read

4 minutes

Storage options for applications

Get the basics on the core concepts for application storage in AKS, including volumes, persistent volumes, storage classes, and persistent volume chains.
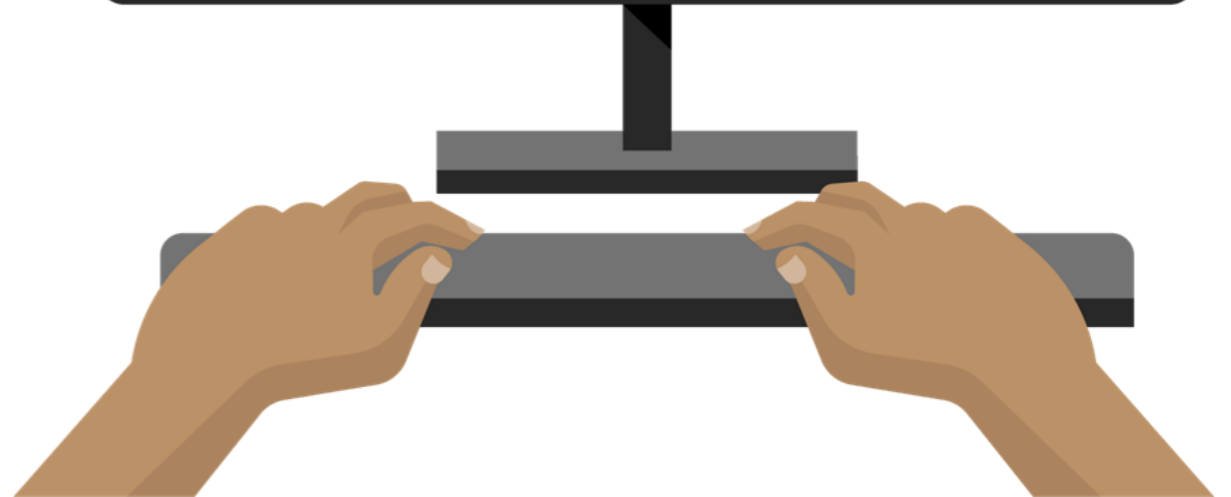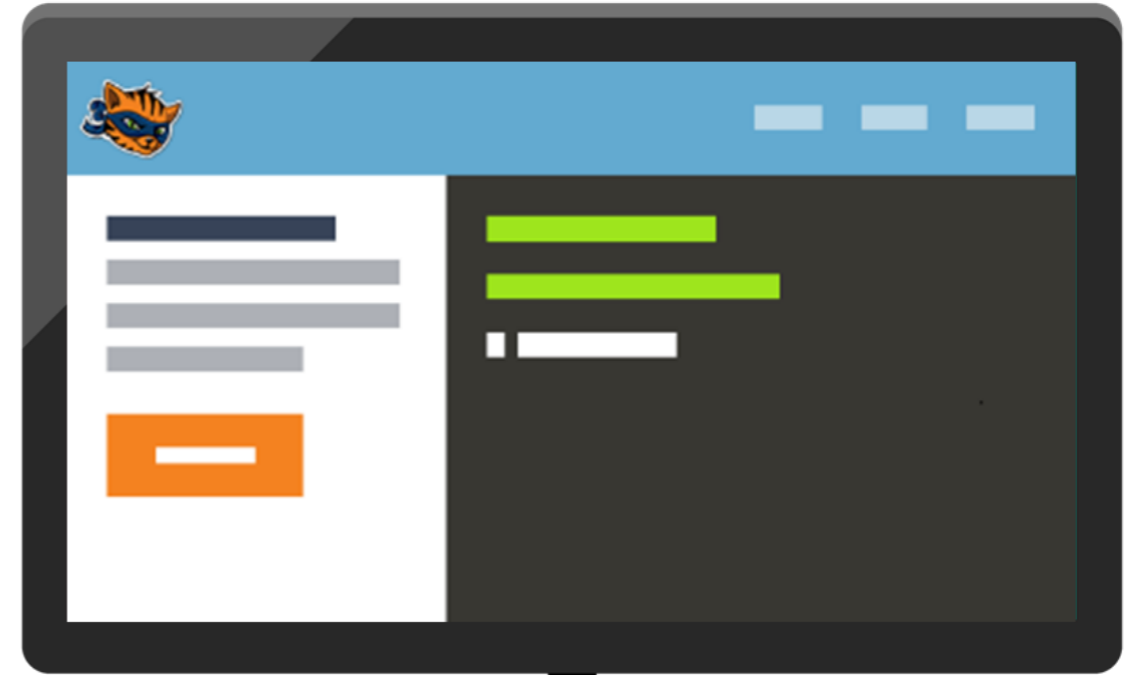
Click here to read

6 minutes

AKS

Day 16-20

Explore Kubernetes with Katacoda

Participate in 10 hands-on, interactive learning modules through Katacoda to run your first container on Kubernetes. The modules explore basic concepts like YAML definitions, networking, secrets, application deployment, and more.

Click here to access

10 modules, 120-190 minutes

Launch a single-node Kubernetes cluster

Minikube is a tool that makes it easy to run Kubernetes locally. The tool runs a single-node Kubernetes cluster inside a VM on your laptop, enabling you to start developing with Kubernetes right away.

Click here to access

10-15 minutes

Deploy containers using YAML

This module builds on the previous one to help you launch your Deployments and Replication Controllers. It teaches you how YAML definitions define Kubernetes Objects and how to schedule those objects for deployment.

Click here to access

10-15 minutes

Get an introduction to networking

Kubernetes's advanced networking capabilities allow pods and Services to communicate inside and externally to the cluster's network. You'll learn about a variety of Kubernetes services, including Cluster IP, Target Ports, Load Balancer, and more.

Click here to access

10-15 minutes

Start containers using Kubectl

In this scenario, you'll learn how to use Kubectl to create Deployments and Replication Controllers and expose them via Services without writing YAML definitions. This allows you to quickly launch containers onto the cluster.

Click here to access

10-15 minutes

Use Kubernetes to manage secrets

Learn how to manage secrets using Kubernetes. Kubernetes allows you to create secrets that are mounted to a pod, which means they can only be managed via an infrastructure team in a secure way—instead of using passwords stored within artifacts.

Click here to access

10-15 minutes

Deploy a service into Kubernetes

In this tutorial, you'll learn about the basics of deploying a service into Kubernetes from source code to a running Kubernetes cluster.
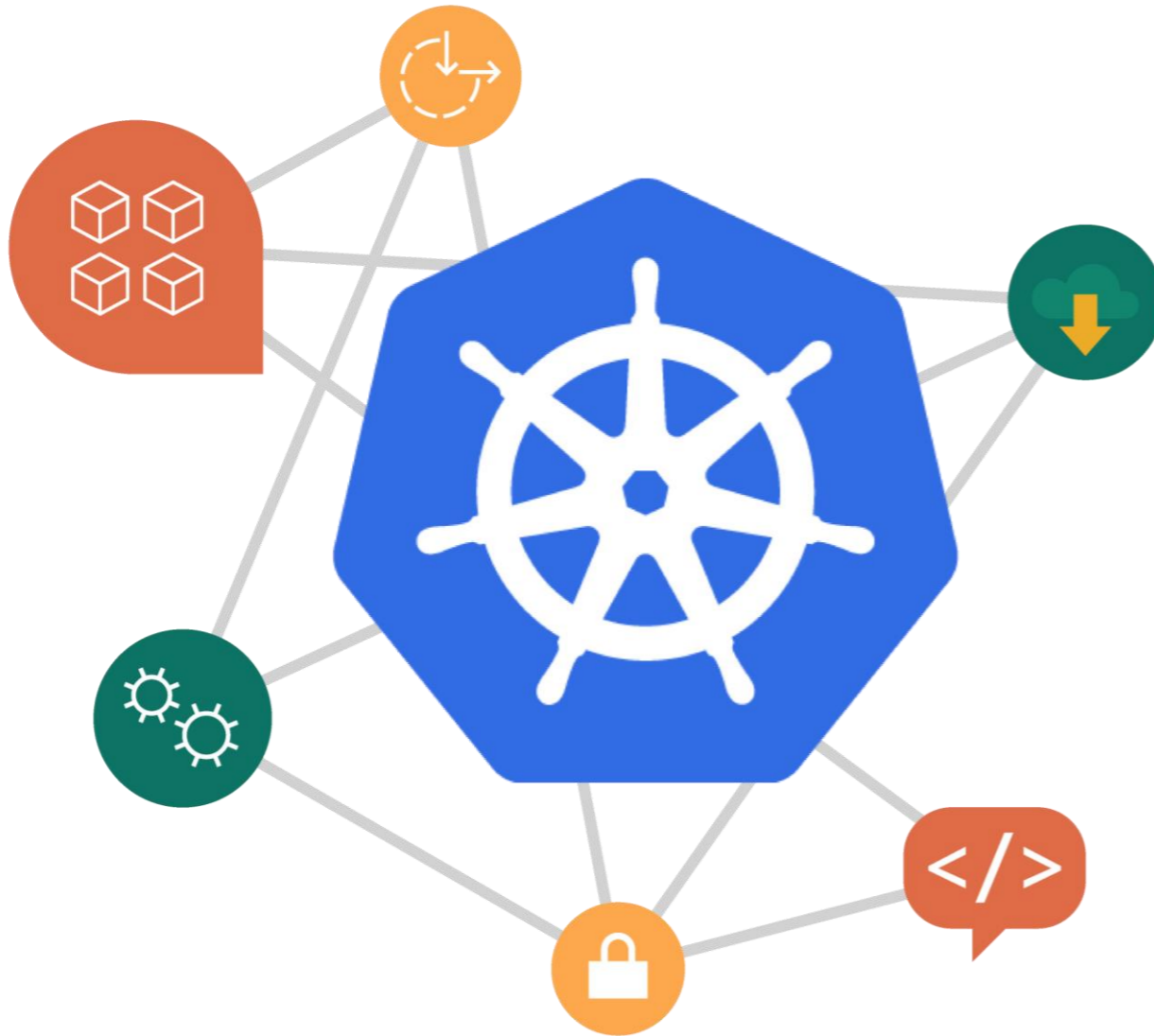
Click here to access

10-15 minutes

Click icon to get back to the learning path

Learn how to define host and path-based Ingress routing

Click here to access

10-15 minutes

Learn how to ensure containers health using Liveness and Readiness probes

Click here to access

10-15 minutes

Use Helm Package Manager for Kubernetes to deploy Redis

Click here to access

10 minutes

Take the first steps to becoming a certified Kubernetes app developer
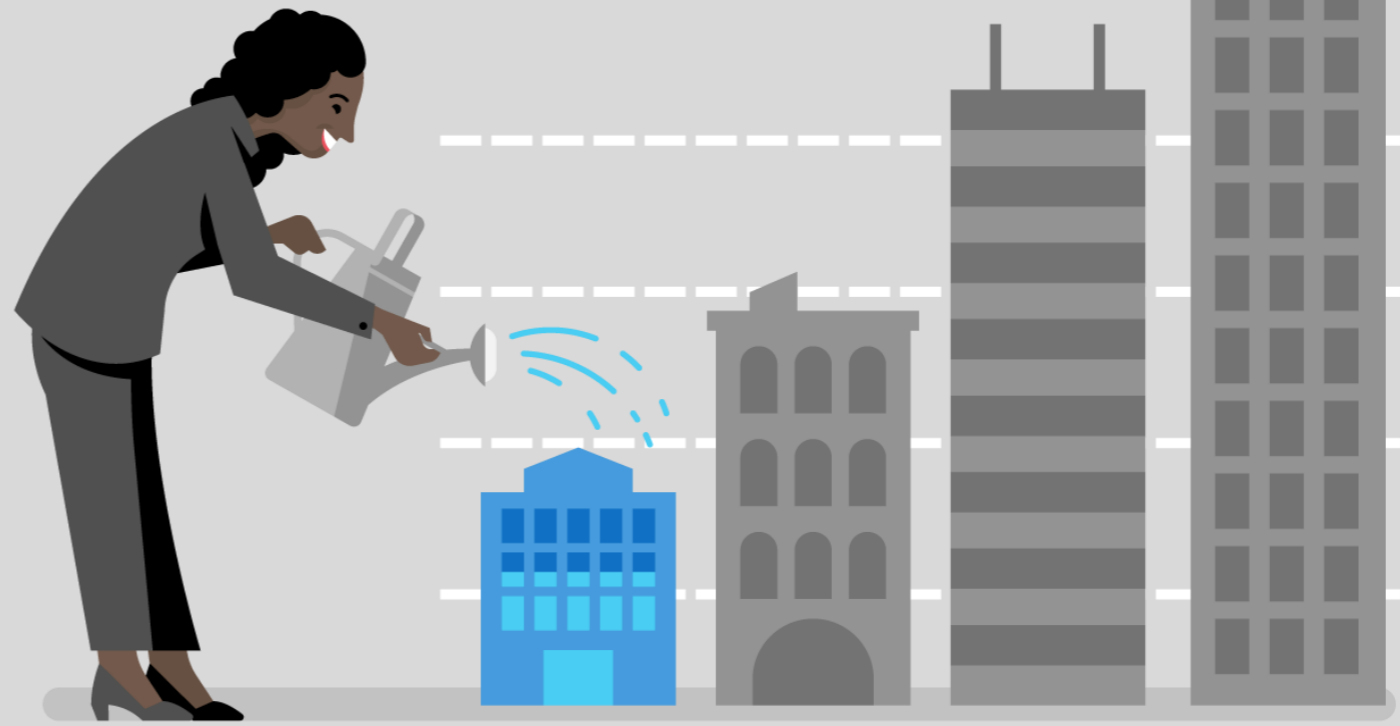
Click here to access

30-60 minutes

Day 21-25

Microservices architecture design

Learn about the infrastructure and DevOps considerations of running a microservices architecture on AKS, including a basic AKS configuration that can serve as your starting point for most microservices deployments.

Click here to read

21 minutes

Day 26-27

Azure Kubernetes Service workshop

Follow a hands-on workshop that takes you through the steps of creating a Kubernetes cluster, deploying a microservices-based application, and setting up a CI/CD pipeline.

Click here to access

1 workshop

Click icon to get back to the learning path

Day 28-32

Distributed system patterns and practices

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

Click here to download

Free eBook

Step 7

Day 33-50

Operational best practices for Kubernetes

Go beyond Day 1 with best practices for Day 2 operations. Start with a new eBook from Brendan Burns, 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 here for the eBook

277 pages

Click here for best practices

11 articles, 67 minutes
1 webinar, 64 minutes

Click icon to get back to the learning path

Develop and debug apps against an AKS cluster

Click here to read

2 minutes

Best practices for cluster isolation in AKS

Click here to read

3 minutes

Best practices for basic scheduler features in AKS

Click here to read

5 minutes

Best practices for cluster security and upgrades in AKS

Click here to read

9 minutes

Best practices for pod security in AKS

Click here to read

10 minutes

Best practices for advanced scheduler features in AKS

Click here to read

6 minutes

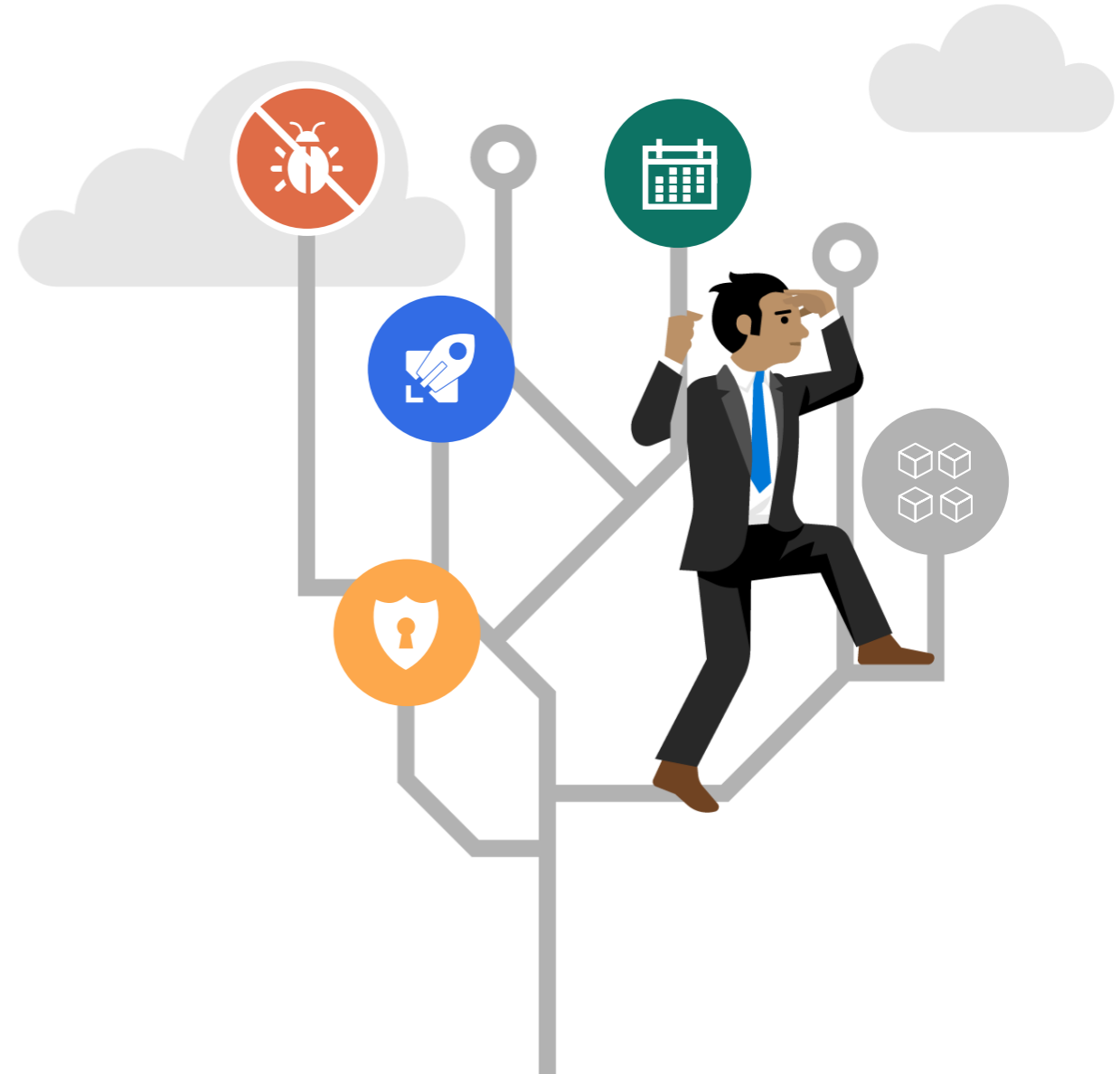## Best practices for authentication and authorization in AKS

Click here to read

5 minutes

Best practices for container image management and security in AKS

Click here to read

3 minutes

Click icon to get back to the learning path

Best practices for network connectivity and security in AKS

[Click here to read]

9 minutes

Best practices for storage and backups in AKS

[Click here to read]

6 minutes

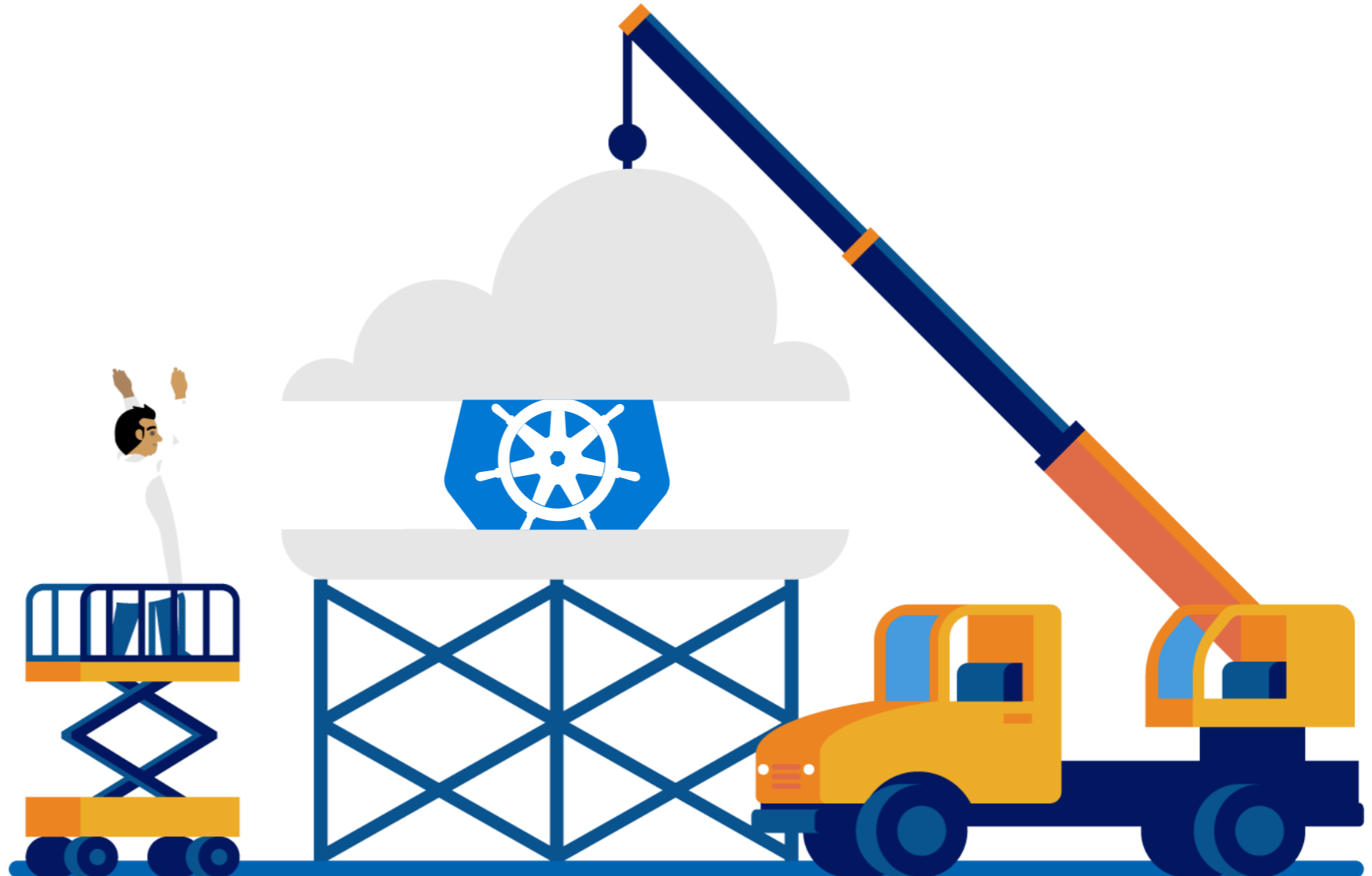## Best practices for business continuity and disaster recovery in AKS

[Click here to read]

10 minutes

Project design and layout for successful Kubernetes apps

[Click here to watch]

63 minutes, 52 seconds

Click icon to get back to the learning path