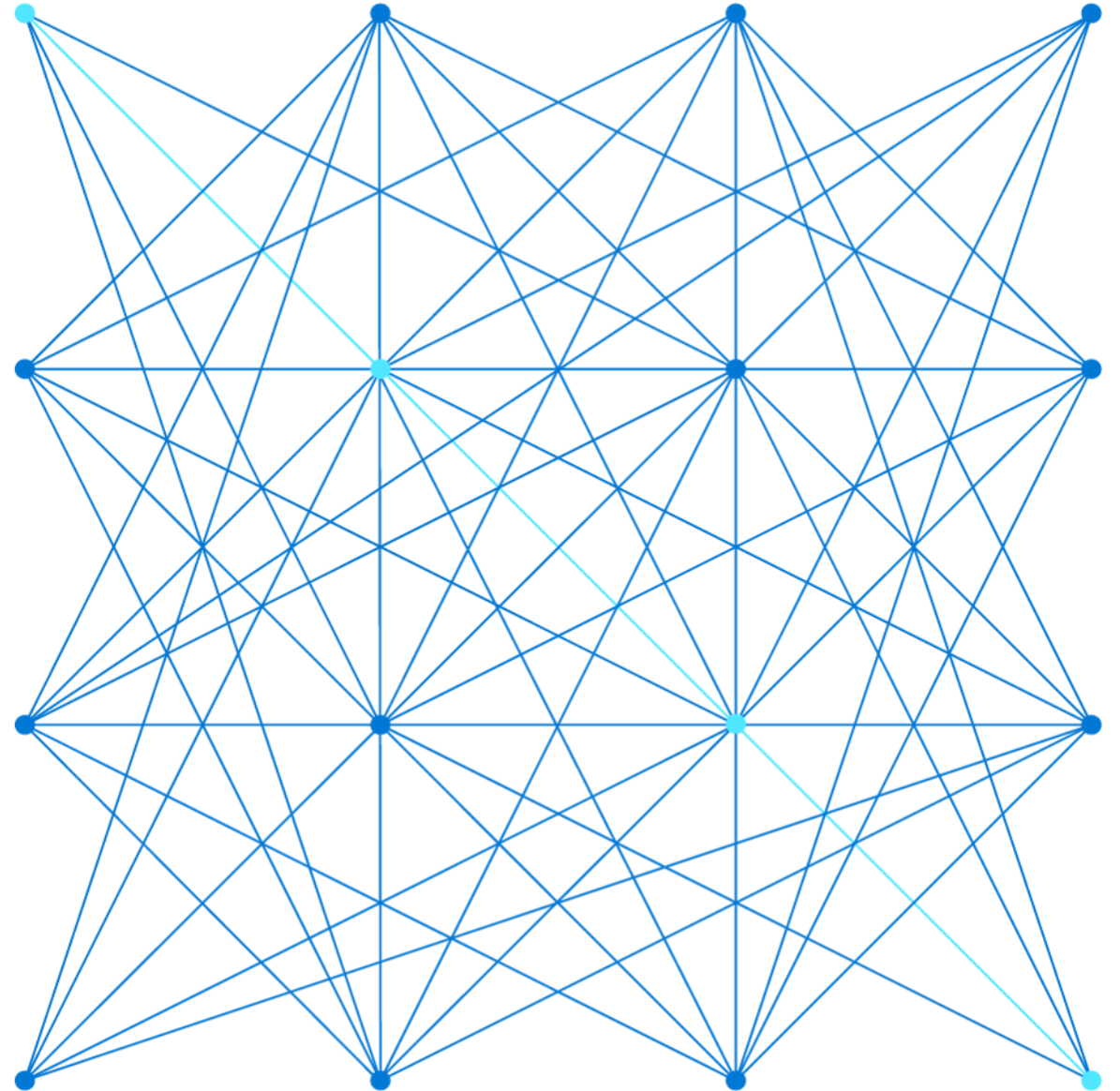


AZ-104T00A

Administer PaaS

Compute Options



Administer PaaS Compute Options Introduction



Configure Azure App Service Plans



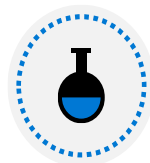
Configure Azure App Services



Configure Azure Container Instances



Configure Azure Kubernetes Service



Lab 09a - Implement Web Apps

Lab 09b - Implement Azure Container Instances

Lab 09c - Implement Azure Kubernetes Service (optional)

Configure Azure App Service Plans



Configure Azure App Service Plans Introduction



Implement Azure App Service Plans



Determine App Service Plan Pricing



Scale Up and Scale Out the App Service Plan



Configure App Service Plan Scaling



Demonstration – Create an App Service Plan

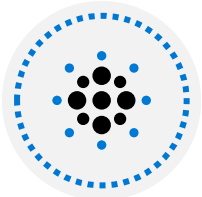


Summary and Resources

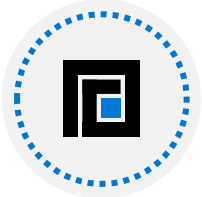
Implement Azure App Service Plans



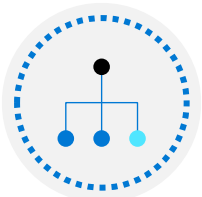
Define a set of compute resources for a web app to run



Determines performance, price, and features



One or more apps can be configured to run in the same App Service plan



Region where compute resources will be created

Number of virtual machine instances

Size of virtual machine instances

Pricing tier (next slide)

Determine App Service Plan Pricing

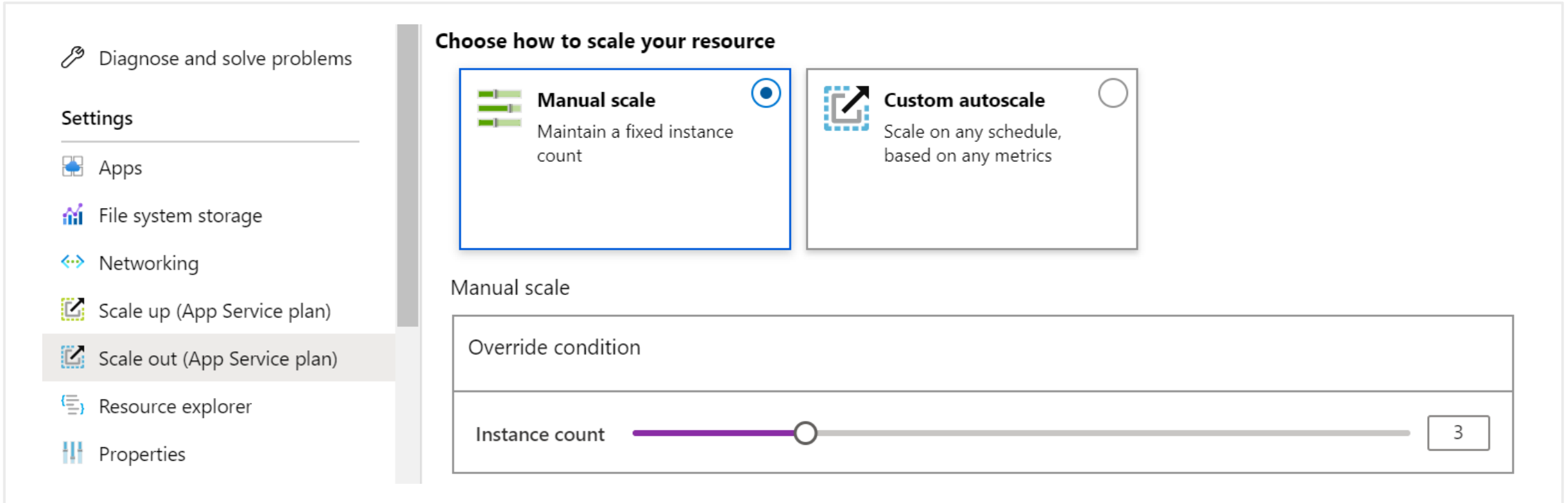
Selected Features	Free	Shared (dev/test)	Basic (dedicated dev/test)	Standard (production workloads)	Premium (enhanced scale and performance)	Isolated (high-performance, security and isolation)
Web, mobile, or API apps	10	100	Unlimited	Unlimited	Unlimited	Unlimited
Disk space	1 GB	1 GB	10 GB	50 GB	250 GB	1 TB
Auto Scale	–	–	–	Supported	Supported	Supported
Deployment Slots	0	0	0	5	20	20
Max Instances	–	–	Up to 3	Up to 10	Up to 30	Up to 100

Shared compute
(Free and Shared). Run apps on the same Azure VM as other App Service apps, and the resources cannot scale out

Dedicated compute
(Basic, Standard, Premium). Run apps in the same plan in dedicated Azure VMs

Isolated. Runs apps on dedicated Azure VMs in dedicated Azure virtual networks

Scale Up and Scale Out the App Service Plan



The screenshot shows the Azure App Service Scale settings page. On the left is a navigation pane with the following items: 'Diagnose and solve problems' (with a wrench icon), 'Settings' (with a gear icon), 'Apps' (with a cloud icon), 'File system storage' (with a bar chart icon), 'Networking' (with a double-headed arrow icon), 'Scale up (App Service plan)' (with a green up arrow icon), 'Scale out (App Service plan)' (with a blue up arrow icon, highlighted with a grey background), 'Resource explorer' (with a folder icon), and 'Properties' (with a list icon). The main content area is titled 'Choose how to scale your resource'. It contains two options: 'Manual scale' (with a green bar chart icon, a blue radio button, and the text 'Maintain a fixed instance count') and 'Custom autoscale' (with a blue dashed box and arrow icon, a white radio button, and the text 'Scale on any schedule, based on any metrics'). Below these, the 'Manual scale' section is expanded, showing an 'Override condition' text box and an 'Instance count' slider. The slider has a purple bar and a white knob, with a numeric input box on the right showing the value '3'.

Choose how to scale your resource

Manual scale
Maintain a fixed instance count

Custom autoscale
Scale on any schedule, based on any metrics

Manual scale

Override condition

Instance count

3

Scale up (change the App Service plan):

More hardware (CPU, memory, disk)


More features (dedicated virtual machines, staging slots, autoscaling)


Scale out (increase the number of VM instances):

Manual (fixed number of instances)


Auto scale (based on predefined rules and schedules)

Configure App Service Plan Scaling

Default Auto created scale condition 




Delete warning  The very last or default recurrence rule cannot be deleted. Instead, you can disable autoscale to turn off autoscale.

Scale mode ☒ Scale based on a metric ☐ Scale to a specific instance count

Rules  No metric rules defined; click hyperlink [Add a rule](#) to scale out and scale in your instances based on rules. For example: 'Add a rule that increases instance count by 1 when CPU percentage is above 70%'.

[+ Add a rule](#)

Instance limits

Minimum 	Maximum 	Default 
<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="1"/>

Schedule **This scale condition is executed when none of the other scale condition(s) match**

Adjust available resources based on the current demand

Improves availability and fault tolerance

Scale based on a metric (CPU percentage, memory percentage, HTTP requests)

Scale according to a schedule (weekdays, weekends, times, holidays)

Can implement multiple rules – combine metrics and schedules

Don't forget to scale in

Demonstration – Create an App Service plan



Create an App Service Plan in the Azure Portal



Review Pricing Tiers



Configure Autoscaling

Summary and Resources – Configure Azure App Service Plans

Knowledge Check Questions

Microsoft Learn Modules (docs.microsoft.com/Learn)










[Scale an App Service web app to efficiently meet demand with App Service scale up and scale out](#)



Configure Azure App Services



Configure Azure App Services Introduction

-  Implement Azure App Service
-  Create an App Service
-  Create Deployment Slots
-  Add Deployment Slots
-  Secure an App Service
-  Create Custom Domain Names
-  Backup an App Service
-  Demonstration – Create an App Service
-  Summary and Resources

Implement Azure App Service



.NET



Node.js



PHP



Java



Python (on Linux)



HTML



Custom Windows/Linux Container

Includes Web Apps, API Apps, Mobile Apps, and Function Apps

Fully managed environment enabling high productivity development

Platform-as-a-service (PaaS) offering for building and deploying highly available cloud apps for web and mobile

Platform handles infrastructure so developers focus on core web apps and services

Developer productivity using .NET, .NET Core, Java, Python and a host of others

Provides enterprise-grade security and compliance

Create an App Service

Name must be unique

Access using *azurewebsites.net* – can map to a custom domain

Publish Code (Runtime Stack)

Publish Docker Container

Linux or Windows

Region closest to your users

App Service Plan

Project Details

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ

Microsoft Azure Internal Consumption

Resource Group * ⓘ

(New) rg1

Create new

Instance Details

Name *

your-app-name

.azurewebsites.net

Publish *

Code Docker Container

Runtime stack *

.NET Core 3.1 (LTS)

Operating System *

Linux Windows

Region *

East US

Not finding your App Service Plan? Try a different region.

App Service Plan

App Service plan pricing tier determines the location, features, cost and compute resources associated with your app.
[Learn more](#)

Windows Plan (East US) * ⓘ

(New) asp1

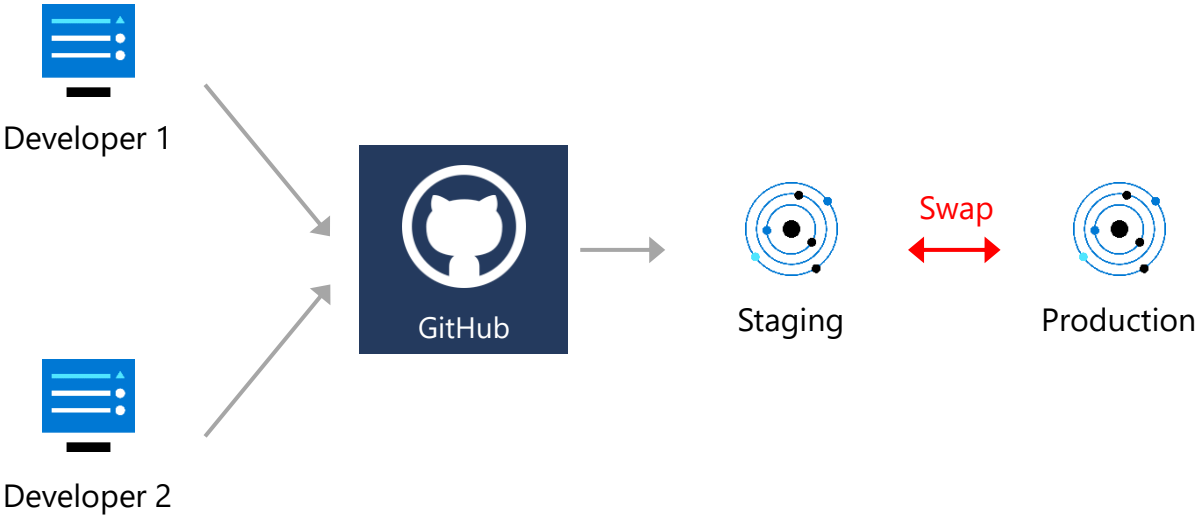
Create new

Sku and size *

Standard S1
100 total ACU, 1.75 GB memory
[Change size](#)

Create Deployment Slots

Continuous Deployment with Stage Slot



Service Plan	Slots
Free, Shared, Basic	0
Standard	Up to 5
Premium	Up to 20
Isolated	Up to 20

- Deploy to a different deployment slots (depends on service plan)
- Validate changes before sending to production
- Deployment slots are live apps with their own hostnames
- Avoids a cold start – eliminates downtime
- Fallback to a last known good site
- Auto Swap when pre-swap validation is not needed

Add Deployment Slots

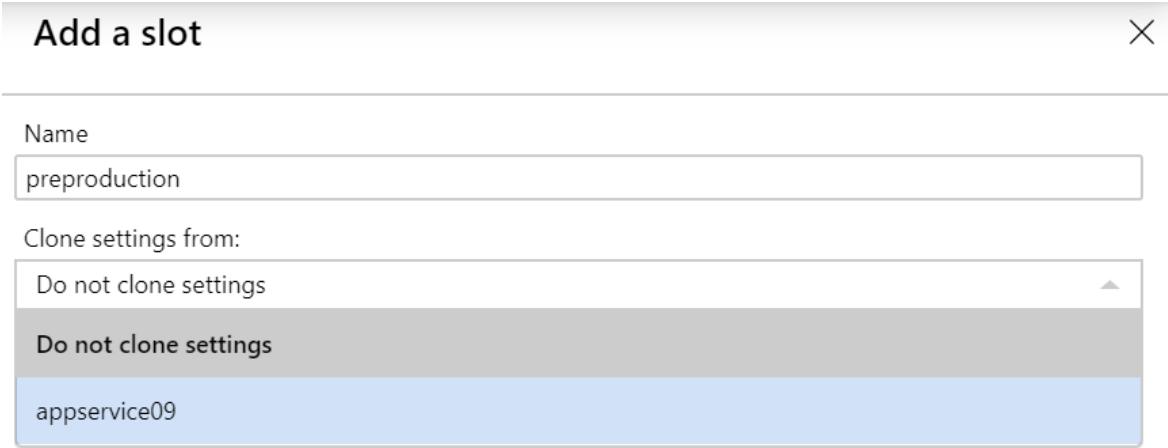
Select whether to clone an app configuration from another deployment slot

When you clone, pay attention to the settings:

- Slot-specific app settings and connection strings
- Continuous deployment settings
- App Service authentication settings

Not all settings are sticky (endpoints, custom domain names, SSL certificates, scaling)

Review and edit your settings before swapping



The screenshot shows a modal dialog titled "Add a slot" with a close button (X) in the top right corner. Inside the dialog, there is a "Name" label followed by a text input field containing the value "preproduction". Below this, there is a "Clone settings from:" label followed by a dropdown menu. The dropdown menu is open, showing three options: "Do not clone settings" (which is currently selected and highlighted in grey), "Do not clone settings" (a second, identical option), and "appservice09" (which is highlighted in blue).

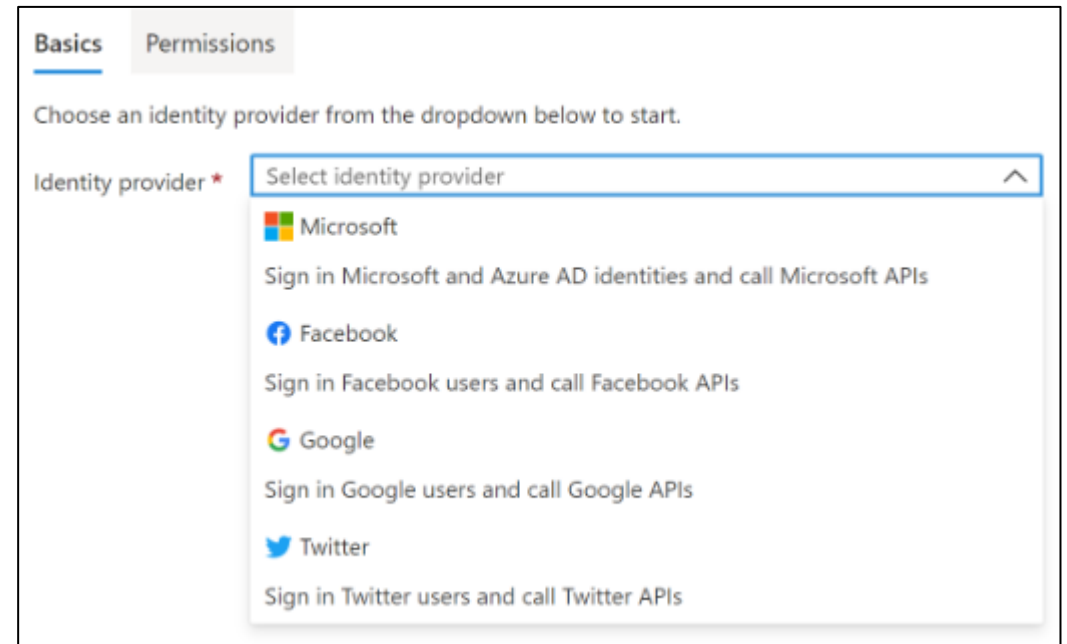
Secure an App Service

Authentication:

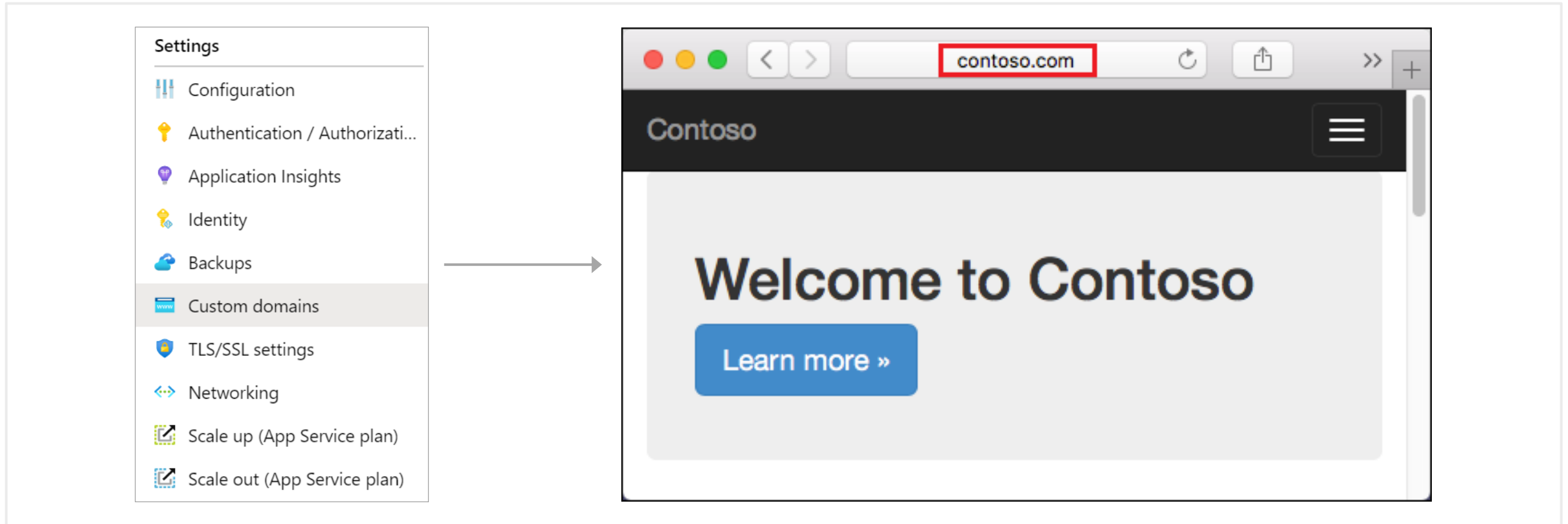
- Enable authentication – default anonymous
- Log in with a third-party identity provider

Security:

- Troubleshoot with Diagnostic Logs – failed requests, app logging
- Add an SSL certificate – HTTPS
- Define a priority ordered allow/deny list to control network access to the app
- Store secrets in the Azure Key Vault



Create Custom Domain Names



Redirect the default web app URL

Validate the custom domain in Azure

Use the DNS registry for your domain provider – create a CNAME or A record with the mapping

Ensure App Service plan supports custom domains

Backup an App Service

Create app backups manually or on a schedule

Backup the configuration, file content, and database connected to the app

Requires Standard or Premium plan

Backups can be up to 10 GB of app and database content

Configure partial backups and exclude items from the backup

Restore your app on-demand to a previous state, or create a new app

Settings



Configuration



Authentication / Authorizati...



Application Insights



Identity



Backups



Custom domains



TLS/SSL settings



Networking



Scale up (App Service plan)



Scale out (App Service plan)

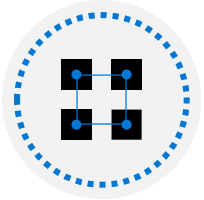
Demonstration – Create an App Service



Create a Web App in the Azure Portal



Test the Web App



Configure Deployment Slots



Configure Backup

Summary and Resources – Configure Azure App Services

Knowledge Check Questions

Microsoft Learn Modules (docs.microsoft.com/Learn)



[Host a web application with Azure App Service \(Sandbox\)](#)

[Stage a web app deployment for testing and rollback by using App Service deployment slots](#)

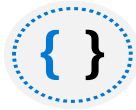
[Dynamically meet changing web app performance requirements with autoscale rules](#)

A sandbox indicates a hands-on exercise.

Configure Azure Container Instances



Configure Azure Container Instances Introduction



Compare Containers to Virtual Machines



Explore Azure Container Instances Benefits



Implement Container Groups



Understand the Docker Platform



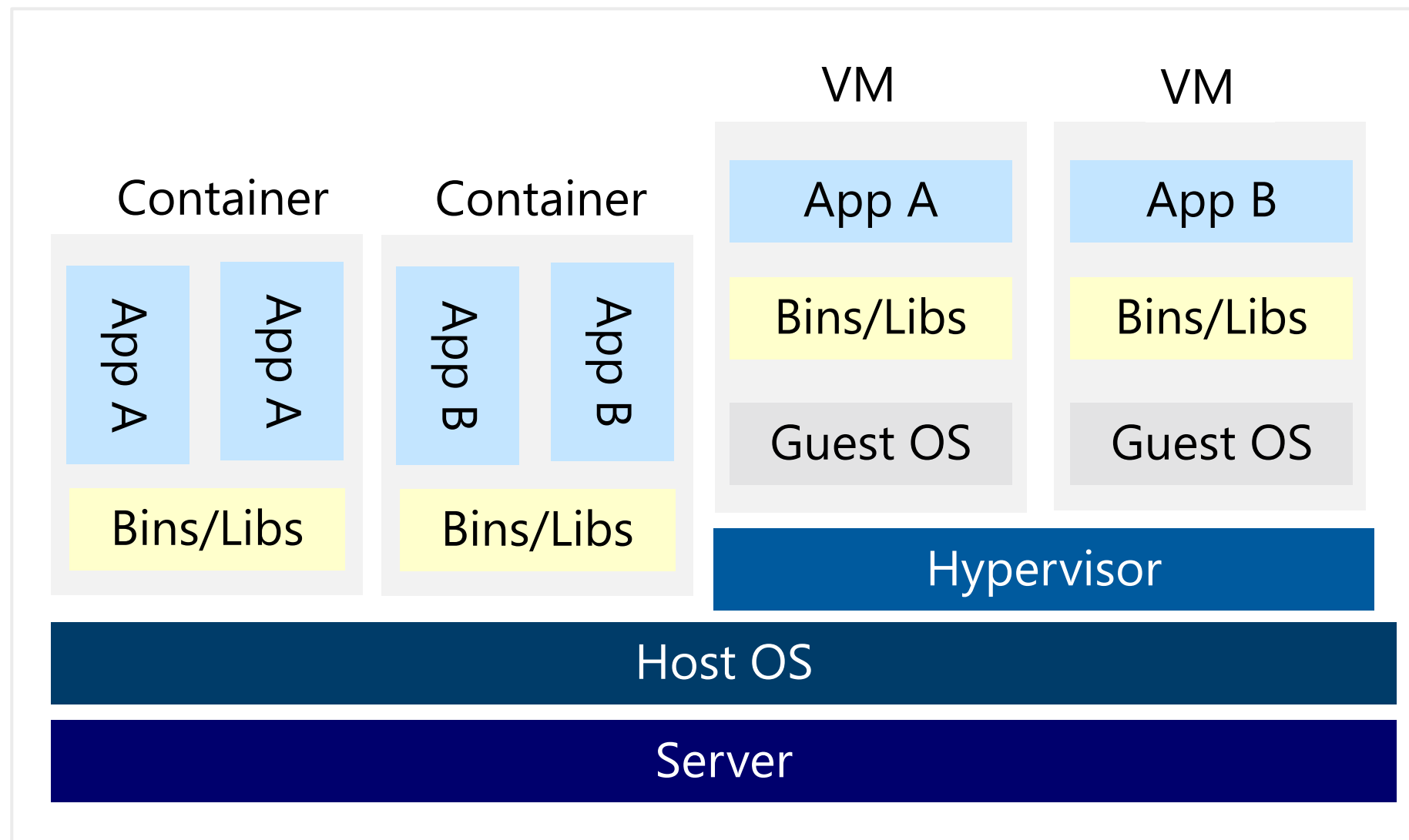
Demonstration – Deploy Azure Container Instances



Summary and Resources

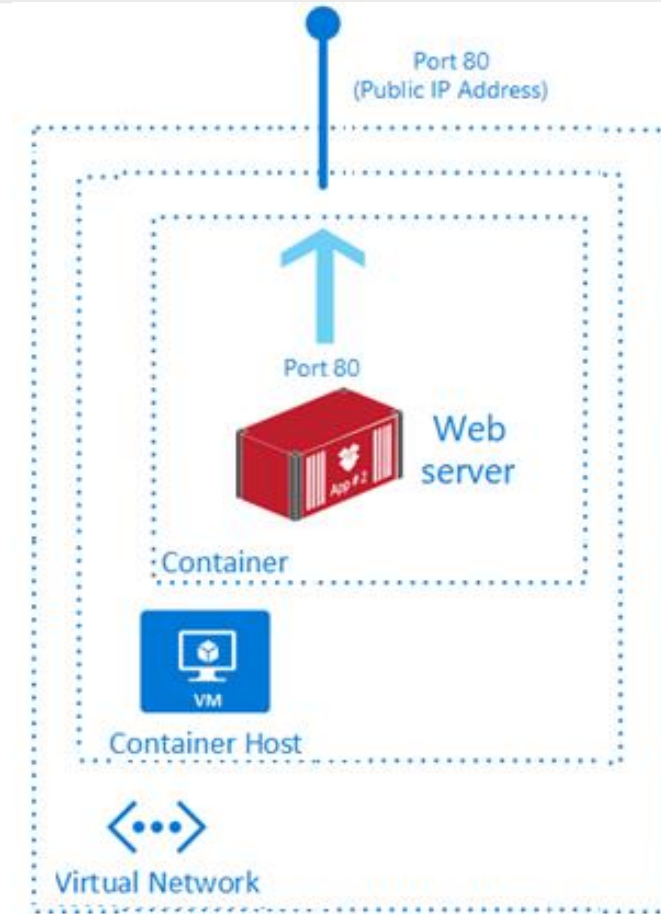
Compare Containers to Virtual Machines

- Isolation
- Operating System
- Deployment
- Persistent storage
- Fault tolerance



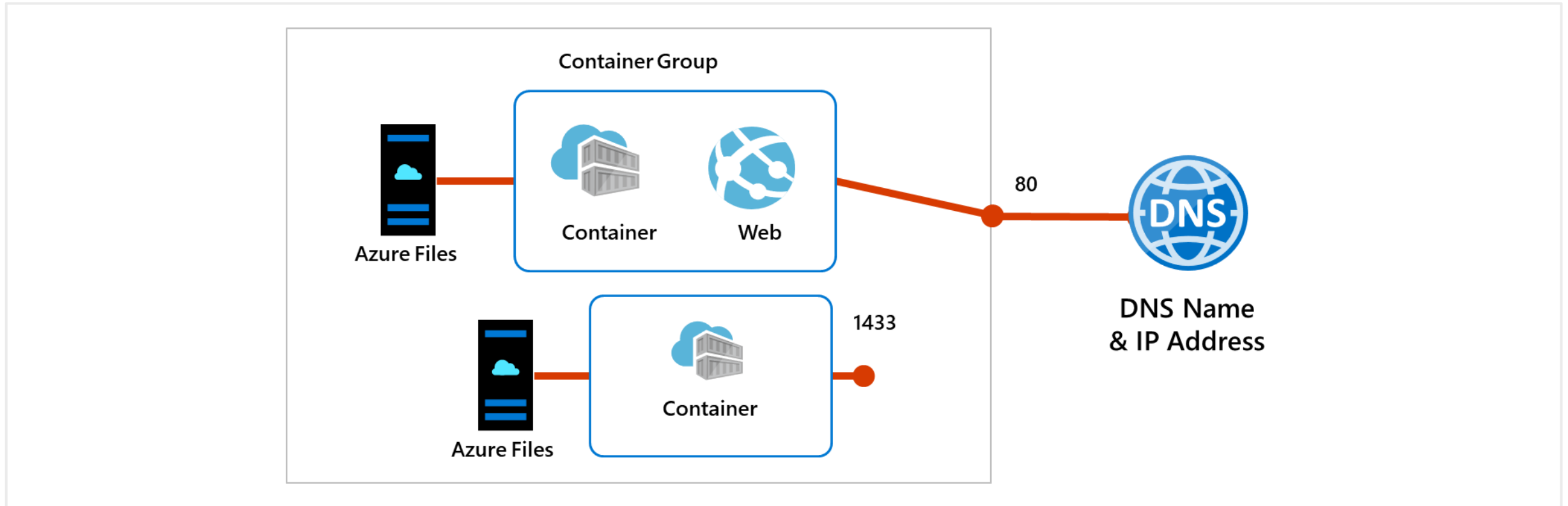
Explore Azure Container Instances Benefits

- PaaS Service
- Fast startup times
- Public IP connectivity and DNS name
- Isolation features
- Custom sizes
- Persistent storage
- Linux and Windows Containers
- Co-scheduled Groups
- Virtual network Deployment



Fastest way to run a container in Azure without provisioning a VM

Implement Container Groups

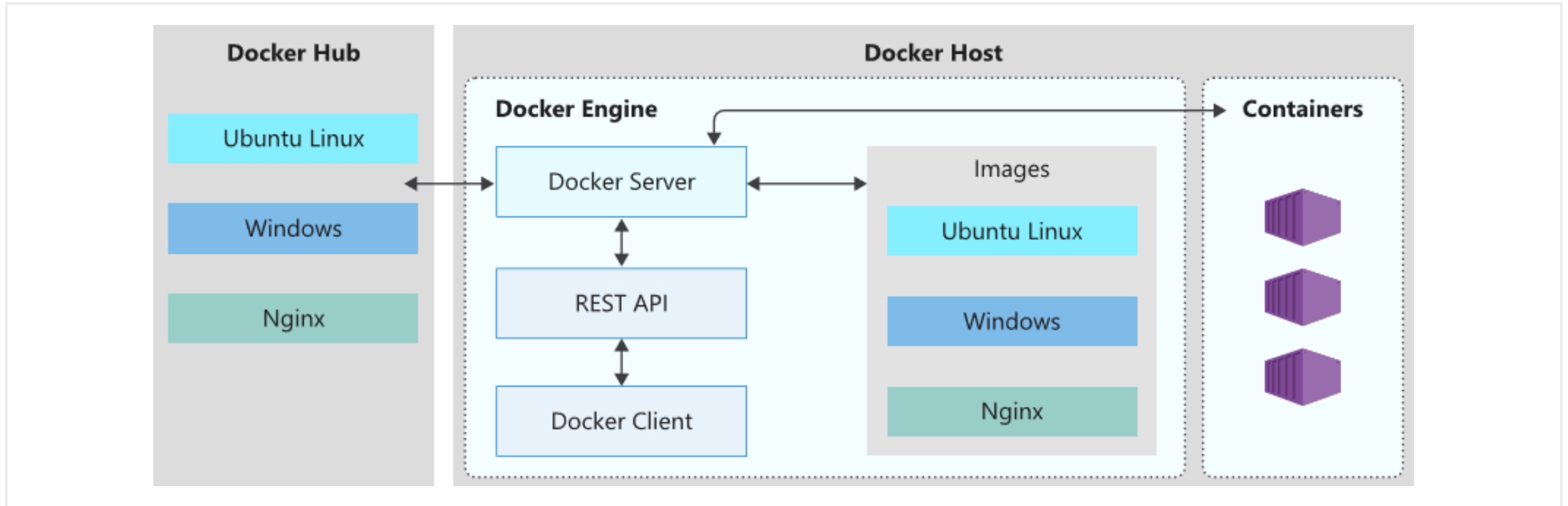


Top-level resource in Azure Container Instances

A collection of containers that get scheduled on the same host

The containers in the group share a lifecycle, resources, local network, and storage volumes

Understand the Docker Platform



Enables developers to host applications within a container

A container is a standardized “unit of software” that contains everything required for an application to run

Available on both Linux and Windows and can be hosted on Azure

Demonstration - Deploy Azure Container Instances



Create a container instance



Verify deployment of the container instance

Summary and Resources – Configure Azure Container Instances

Knowledge Check Questions

Microsoft Learn Modules (docs.microsoft.com/Learn)











[Run Docker containers with Azure Container Instances](#)

[Build a containerized web application with Docker](#)

Configure Azure Kubernetes Service

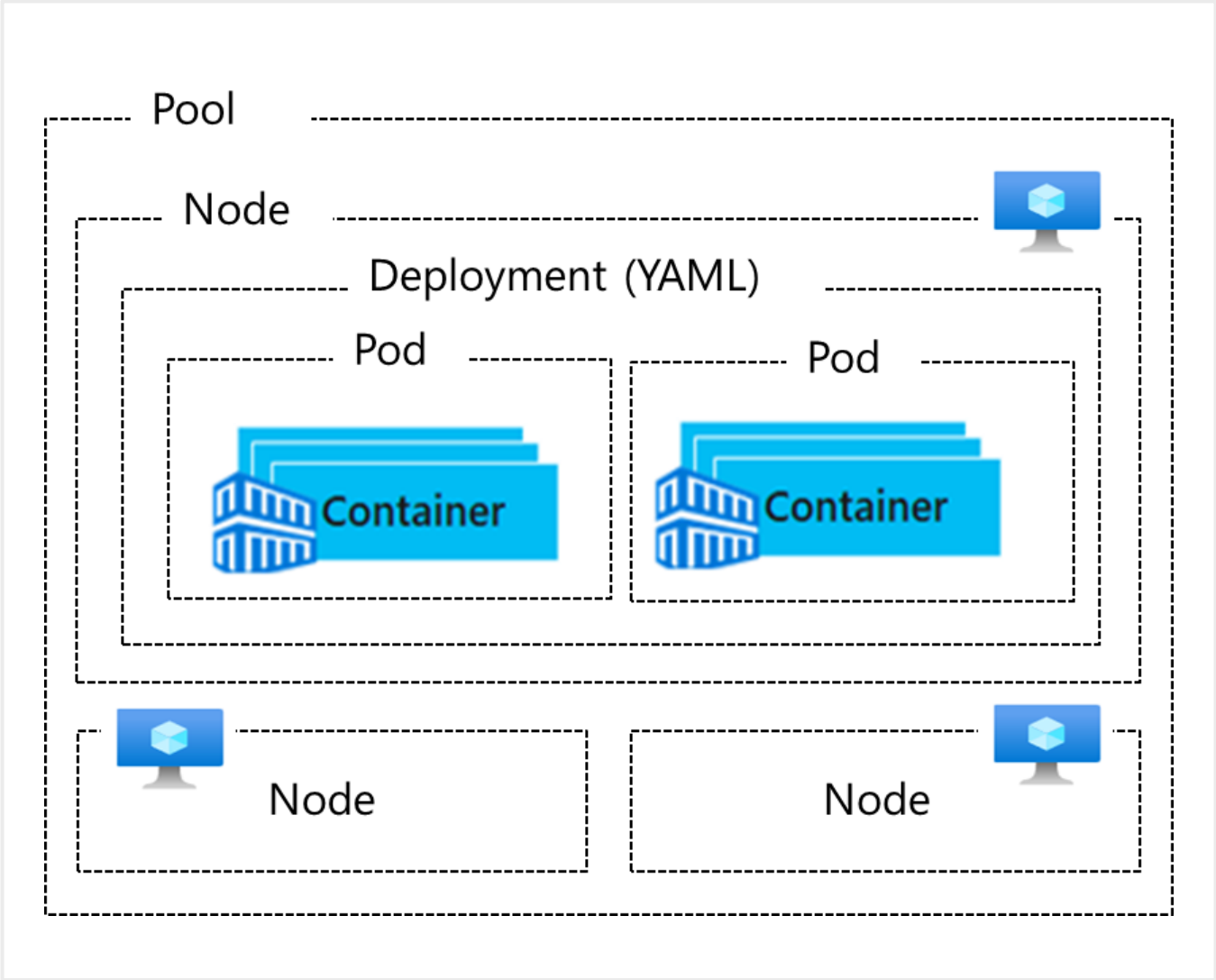


Configure Azure Kubernetes Service Introduction

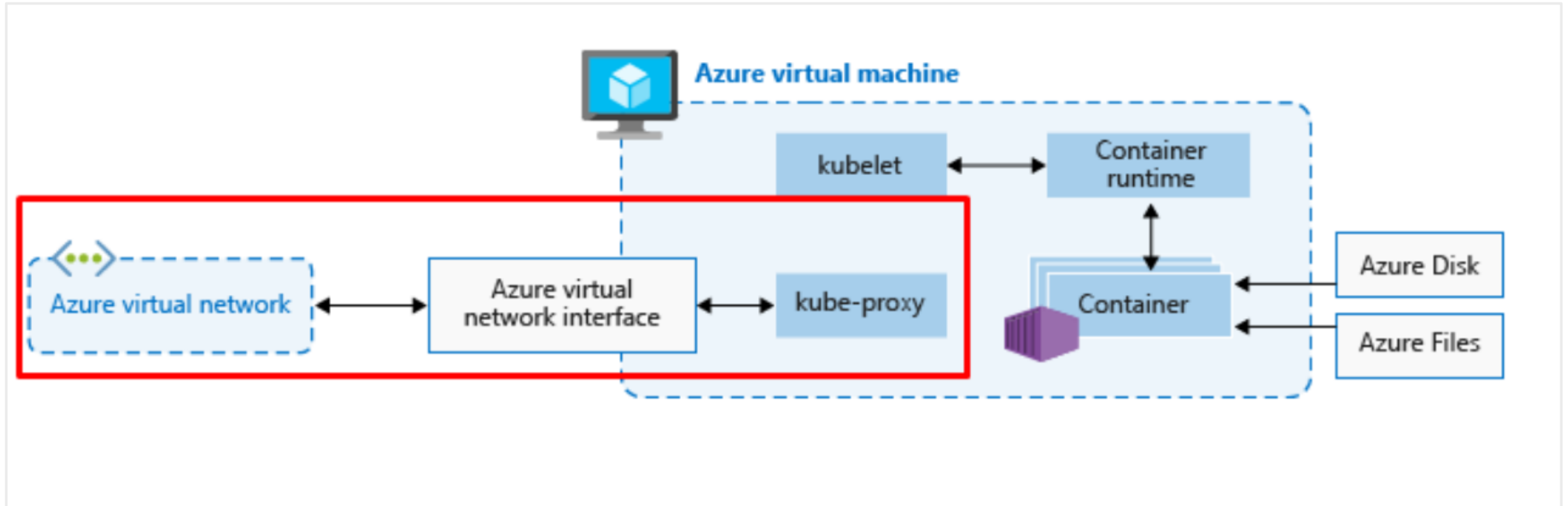
-  Understand AKS Terminology
-  Understand AKS Clusters and Nodes
-  Configure AKS Networking
-  Configure AKS Storage
-  Configure AKS Scaling
-  Configure AKS Scaling to ACI (optional)
-  Demonstration – Deploy Azure Kubernetes Service (optional)
-  Summary and Resources

Understand AKS Terminology

Term	Description
Pools	Groups of nodes with identical configurations
Nodes	Individual VMs running containerized applications
Pods	Single instance of an application. A pod can contain multiple containers
Deployment	One or more identical pods managed by Kubernetes
Manifest	YAML file describing a deployment



Understand AKS Clusters and Nodes

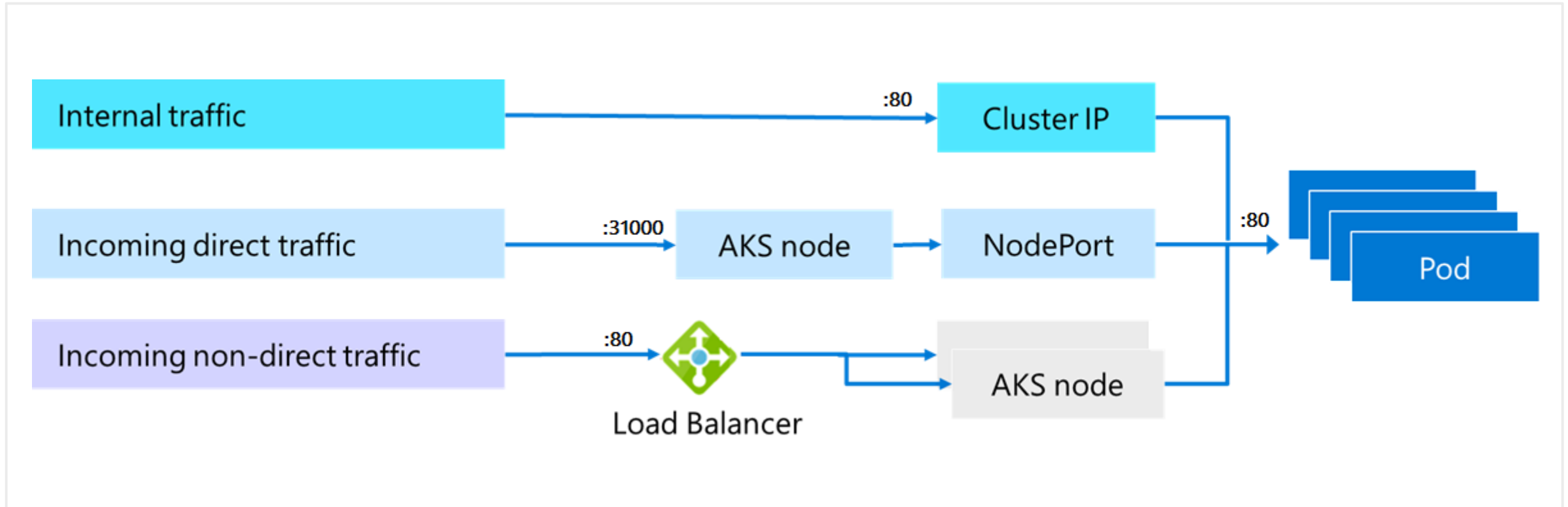


Azure-managed node provides core Kubernetes services and orchestration

Customer-managed nodes run applications and supporting services

Each individual node is an Azure virtual machine

Configure AKS Networking



Pods run an instance of your application

Services group pods together to provide network connectivity

ClusterIP provides internal traffic access

NodePort provides mapping for incoming direct traffic

LoadBalancer has external IP address for incoming non-direct traffic

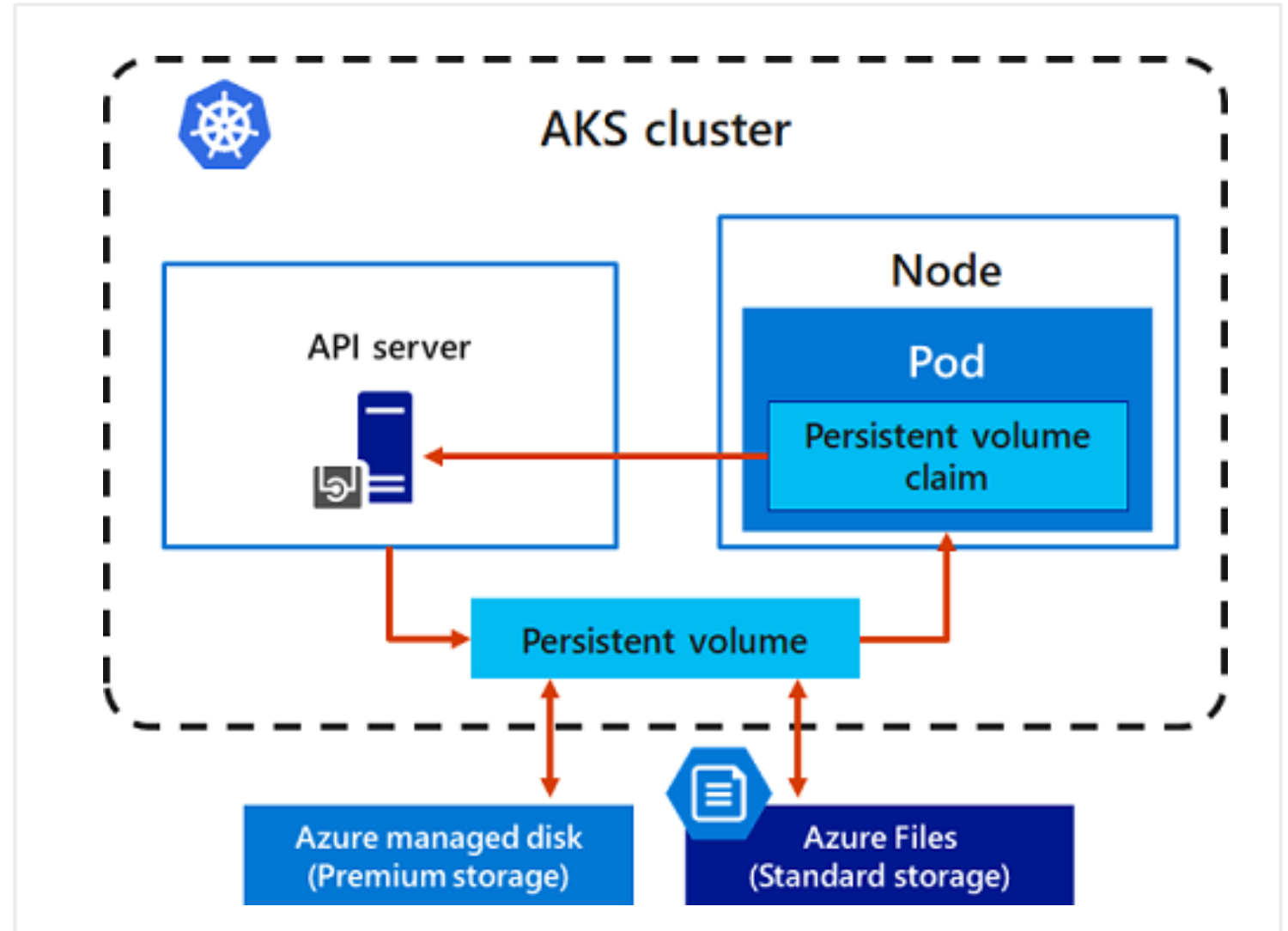
Configure AKS Storage

Local storage on the node is fast and simple to use

Local storage might not be available after the pod is deleted

Multiple pods may share data volumes

Storage could potentially be reattached to another pod



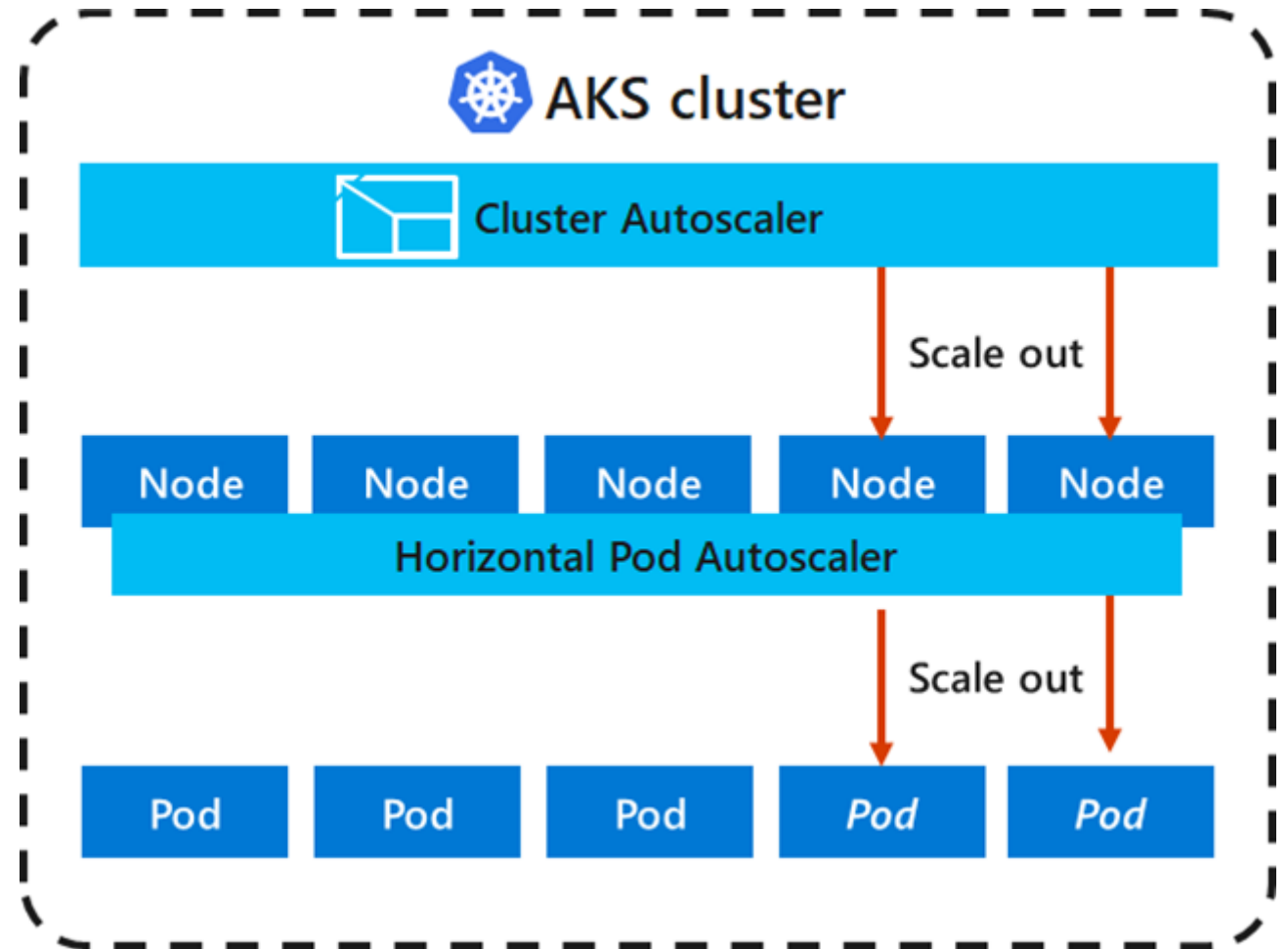
Configure AKS Scaling

Applications might grow beyond the capacity of a single pod

Kubernetes has built-in autoscalers

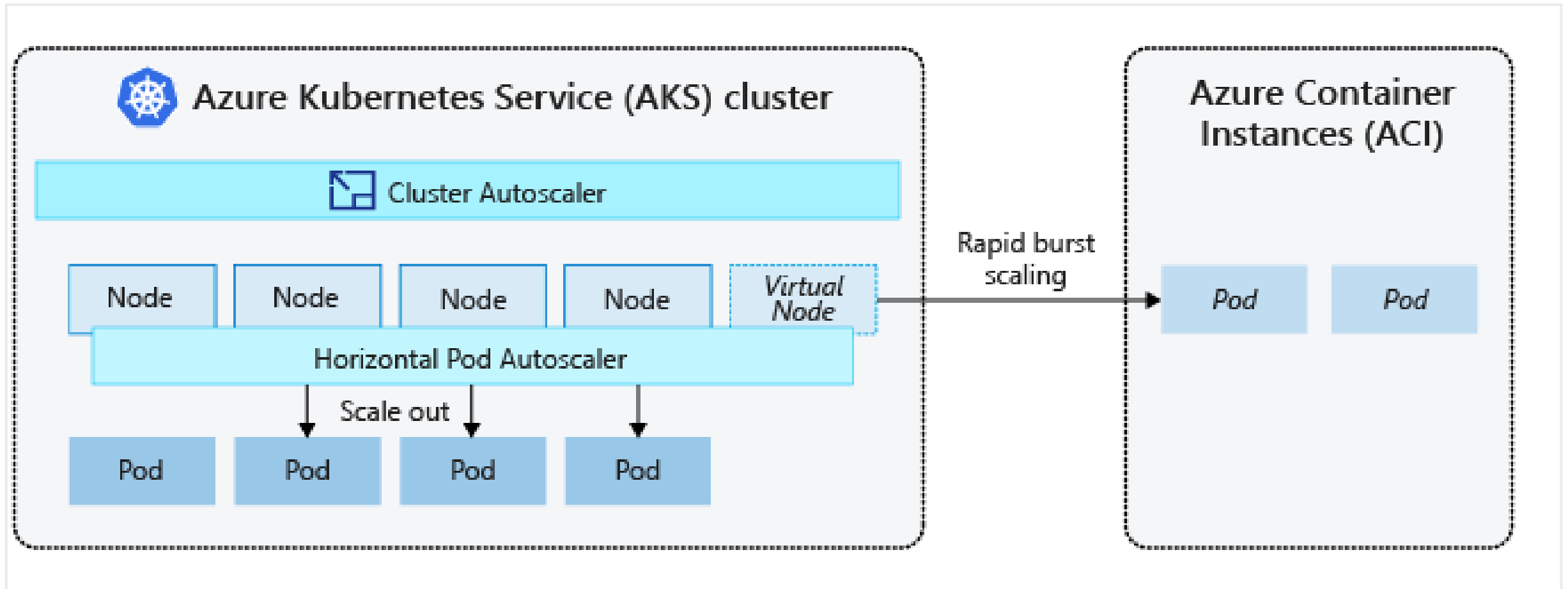
Cluster autoscaler scales based on compute resources

Horizontal pod autoscaler scales based on metrics



Configure AKS Scaling to ACI (optional)

If you need to rapidly grow your AKS cluster, you can create new pods in Azure Container Instances

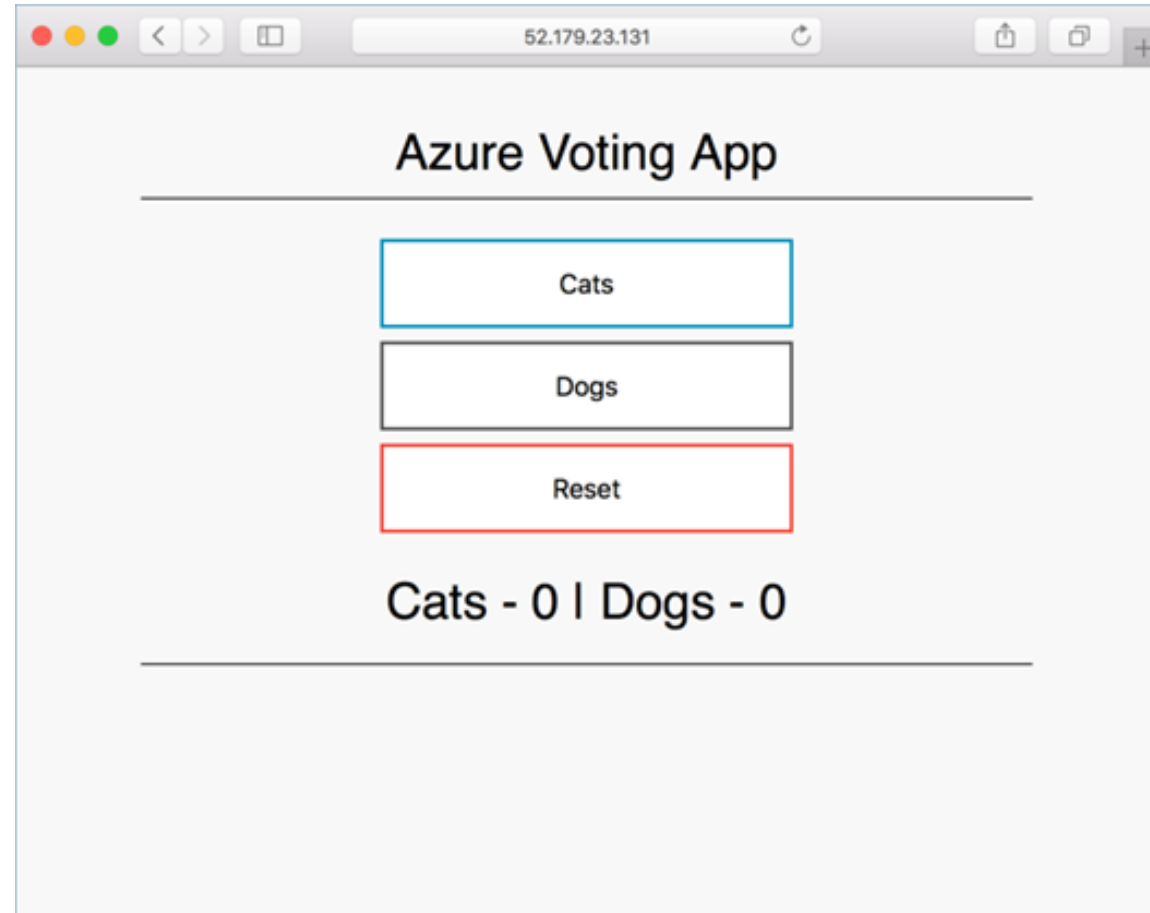


Demonstration – Deploy Azure Kubernetes Service (optional)

Create a
Kubernetes service

Connect
to the cluster

Test the
applications



Summary and Resources – Configure Azure Kubernetes Service

Knowledge Check Questions

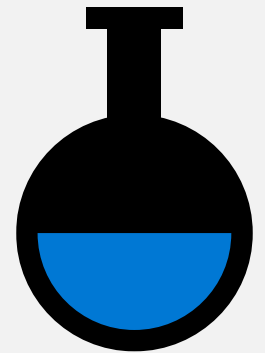
Microsoft Learn Modules (docs.microsoft.com/Learn)



[Introduction to Azure Kubernetes Service](#)

[Implement Azure Kubernetes Service \(AKS\)](#)

Lab 09a - Implement Web Apps
Lab 09b - Implement Azure Container Instances
Lab 09c - Implement Azure Kubernetes Service (optional)



Lab 09a – Implement web apps

Lab scenario

You need to evaluate the use of Azure Web apps for hosting Contoso's web sites, hosted currently in the company's on-premises data centers. The web sites are running on Windows servers using PHP runtime stack. You also need to determine how you can implement DevOps practices by leveraging Azure web apps deployment slots

Objectives

Task 1:

Create an Azure web app

Task 2:

Create a staging deployment slot

Task 3:

Configure web app deployment settings

Task 4:

Deploy code to the staging deployment slot

Task 5:

Swap the staging slots

Task 6:

Configure and test autoscaling of the Azure web app

Next slide for an architecture diagram 

Lab 09a – Architecture diagram

Task 1



az104-09a-rg1

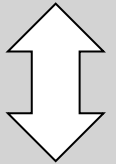


AppService



Production slot

Task 5



Swap the
staging slot

Task 2



Staging slot

Task 3



Local git

AppServiceplan

Task 6



Autoscale rule

php-docs-hello-world
code

Task 4



php-docs-hello-world
code



Lab 09b – Implement Azure Container Instances

Lab scenario

Contoso wants to find a new platform for its virtualized workloads. You identified several container images that can be leveraged to accomplish this objective. Since you want to minimize container management, you plan to evaluate the use of Azure Container Instances for deployment of Docker images

Objectives

Task 1:

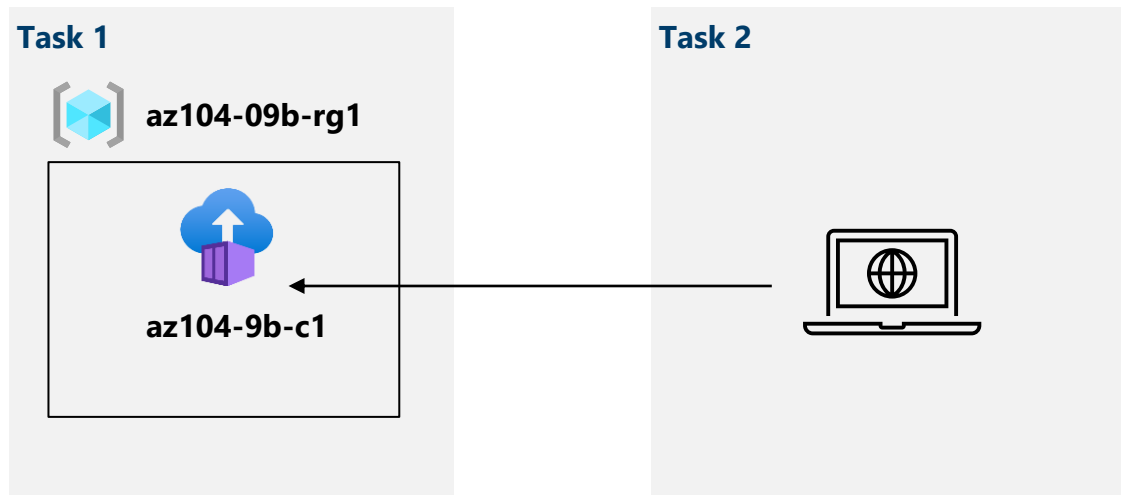
Deploy a Docker image by using the Azure Container Instance

Task 2:

Review the functionality of the Azure Container Instance

Next slide for an architecture diagram 

Lab 09b – Architecture diagram



Lab 09c – Implement Azure Kubernetes service (optional)

Lab scenario

Contoso has several multi-tier applications that are not suitable to run by using Azure Container Instances. To determine whether they can be run as containerized workloads, you want to evaluate using Kubernetes as the container orchestrator. To minimize management overhead, you want to test Azure Kubernetes Service, including its simplified deployment experience and scaling

Objectives

Task 1:

Deploy an Azure Kubernetes Service cluster

Task 2:

Deploy pods into the Azure Kubernetes Service cluster

Task 3:

Scale containerized workloads in the Azure Kubernetes service cluster

Next slide for an architecture diagram 

Lab 09c – Architecture diagram

Task 1

CloudShell



Register the Microsoft.Kubernetes and Microsoft.KubernetesConfiguration resource providers

Task 2

 az104-09c-rg1



az104-09c-aks1

Task 3



Nginx pod

Task 4



Nginx pod scale

 MC_az104-09c-rg1_az104-09c-aks1_region



Public IP address



Route table



Kubernetes
Load Balancer



NSG



Node Scale Set



AKS Vnet



Node



Node scale

End of presentation

