Microsoft

AZ-204T00A

Learning Path 01: Implement Azure App Service web apps

Agenda

- Explore Azure App Service
- Configure web app settings
- Scale apps in Azure App Service
- Explore Azure App Service deployment slots

Module 1: Explore Azure App Service

Learning objectives

- Describe Azure App Service key components and value.
- Explain how Azure App Service manages authentication and authorization.
- Identify methods to control inbound and outbound traffic to your web app.
- Deploy an app to App Service using Azure CLI commands.

Introduction

- Azure App Service is an HTTP-based service for hosting web applications, REST APIs, and mobile back ends.
- Applications run and scale in both Windows and Linux-based environments

Examine Azure App Service

Built-in scale support

- Save costs and meet demand through scaling
- Scale out/in manually or automated based on metrics
- Scale up/down by changing the app service plan

Continuous integration/ deployment support

- Azure DevOps
- GitHub
- Bitbucket
- FTP
- Local Git repository
- And others

Deployment slots

- Target deployments to test or production environments
- Customize what settings are swapped between slots

Examine Azure App Service plans

App Service plans

- Define a set of compute resources
- Can run one or more apps in the same plan
- Can be scaled up or down at any time to meet compute or feature needs

Usage tiers

- Shared: shared compute resources targeting dev/test
- Basic: dedicated compute targeting dev/test
- Standard: run production workloads
- Premium: Enhanced performance and scale
- Isolated: high-performance, security and isolation

How does my app run and scale?

- Shared: apps receive CPU minutes on a shared VM instance and can't scale out
- Other tiers: apps run on all the VM instances configured in the App Service plan

Deploy to App Service

Every development team has unique requirements for their deployment pipeline. App Service supports both automated and manual deployment.

Automated deployment

- Azure DevOps
- GitHub
- Bitbucket

Manual deployment

- Git
- CLI
- Zipdeploy
- FTP/S

Deployment slots

- Target deployments to test or production environments
- Customize what settings are swapped between slots

Explore authentication and authorization in App Service

- Built-in authentication and authorization support
  - Implement with low to no code changes in your web app

- Identity providers available by default
  - Microsoft Identity Platform
  - Facebook
  - Google
  - Twitter
  - Apple
  - OpenID Connect

Discover App Service networking features

Multitenant App Service networking features

- Inbound features
  - App-assigned address
  - Access restrictions
  - Service endpoints
- Private endpoints
  - Outbound features
  - Hybrid Connections
  - Gateway-required VNet Integration
  - VNet Integration

Single-tenant networking

Azure App Service Environment hosts Isolated SKU plans directly in your Azure virtual network.

- **External:** Exposes the hosted apps by using an IP address that is accessible on the internet.
- **Internal load balancer:** Exposes the hosted apps on an IP address inside your virtual network.

Exercise: Create a static HTML web app by using Azure Cloud Shell

- In this exercise, you deploy a basic HTML+CSS site to Azure App Service by using the Azure CLI **`az webapp up`** command.
- You then update the code and redeploy it by using the same command.

Objectives

- Download the sample app
- Create the web app
- Update and redeploy the app

Summary and knowledge check

In this module, you learned how to:

- Describe Azure App Service key components and value.
- Explain how Azure App Service manages authentication and authorization.
- Identify methods to control inbound and outbound traffic to your web app.
- Deploy an app to App Service using Azure CLI commands.

1. Which App Service plan category provides the maximum scale-out capabilities?
2. What networking feature of App Service can be used to control outbound network traffic?

Module 2: Configure web app settings

Learning objectives

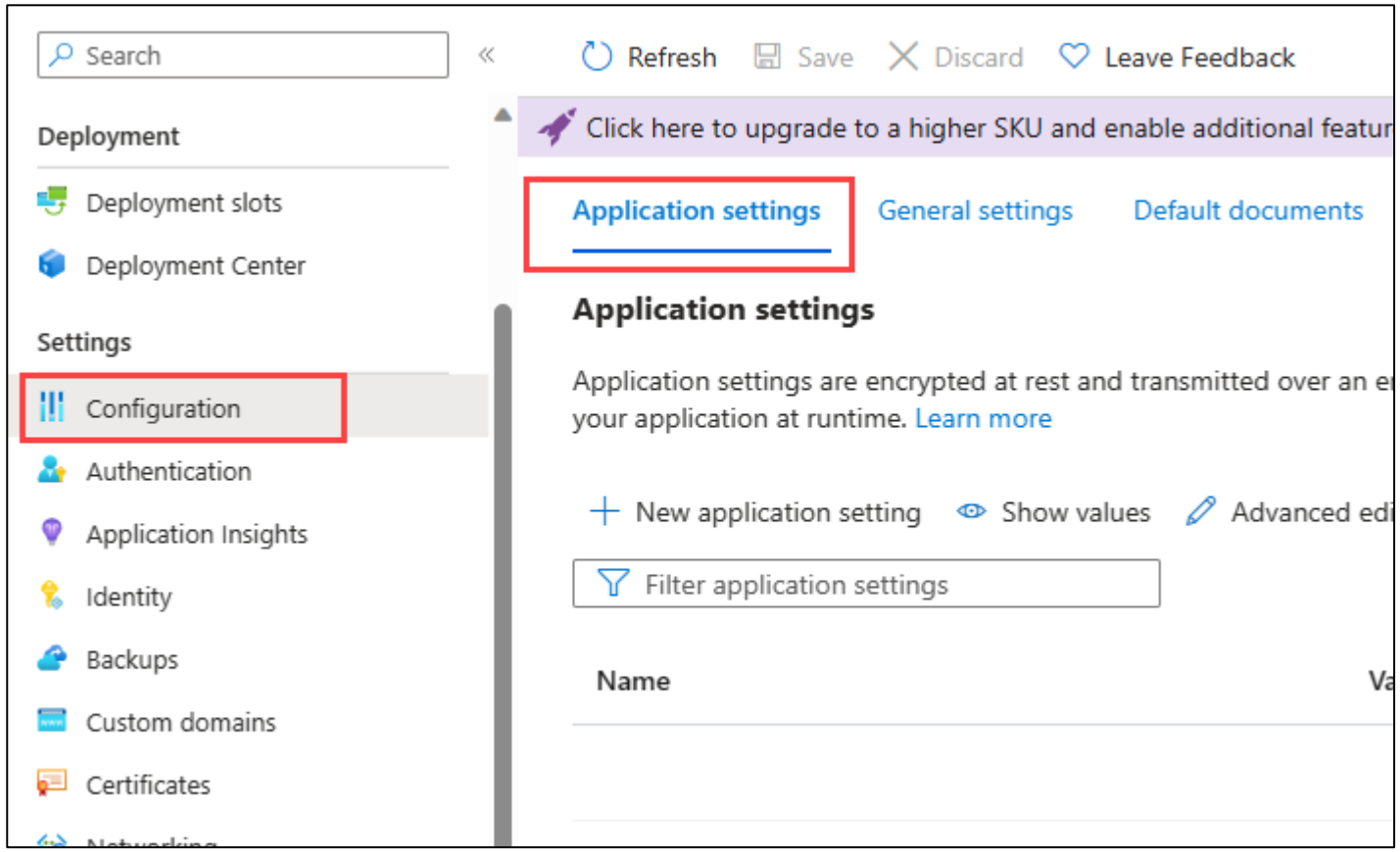
- Create application settings that are bound to deployment slots.
- Explain the options for installing TLS certificates for your app.
- Enable diagnostic logging for your app to aid in monitoring and debugging.
- Create virtual app to directory mappings.

Introduction

- In App Service, app settings are passed as environment variables to the application code.
- For Linux apps and custom containers, App Service passes app settings to the container using the **`--env`** flag to set the environment variable in the container.

Configure application settings (1 of 2)

- Adding and editing settings
  - To add a new app setting, click **New application setting.**
  - To add or edit app settings in bulk, click the **Advanced** edit button.
- Configure connection strings
  - Adding and editing connection strings follow the same principles as other app settings and they can also be tied to deployment slots.



Configure application settings (2 of 2)

Editing settings in bulk

```
[
    {
      "name": "name-1",
      "value": "conn-string-1",
      "type": "SQLServer",
      "slotSetting": false
    },
    {
      "name": "name-2",
      "value": "conn-string-2",
      "type": "PostgreSQL",
      "slotSetting": false
    },
    ...
  ]
```

Configure general settings

Stack settings

The software stack to run the app, including the language and SDK versions.

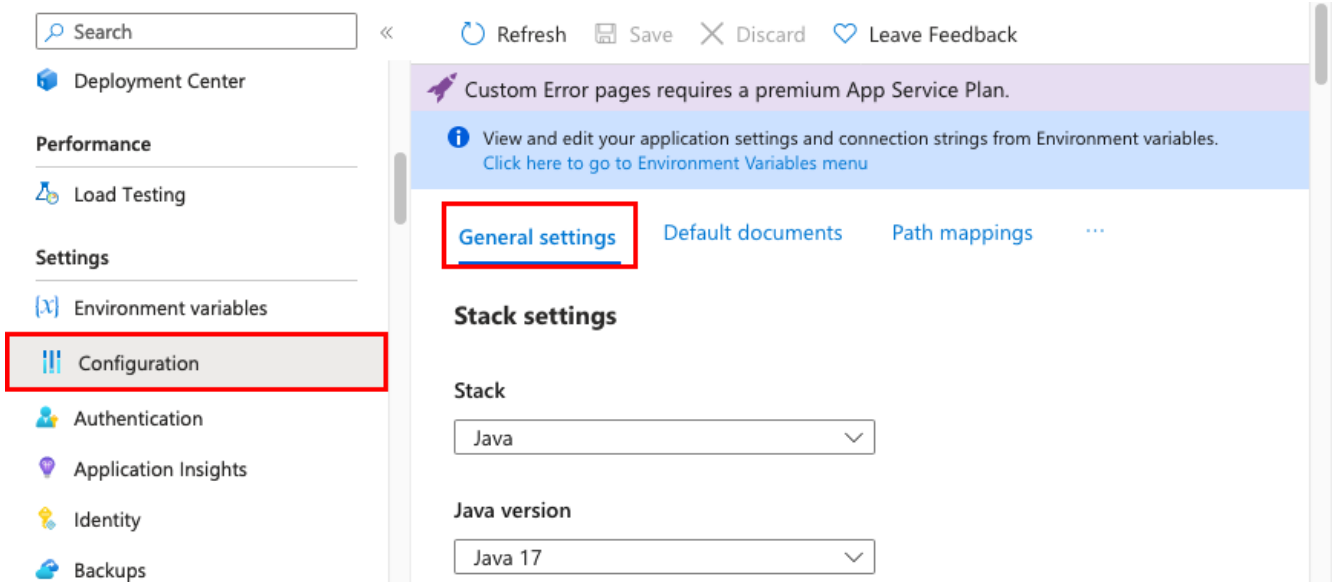
Debugging

Enable remote debugging for ASP.NET , ASP.NET Core, or Node.js apps.

Platform settings

Configure settings for the hosting platform, including:

- Bitness (32-bit or 64-bit)
- WebSocket protocol
- Always On
- Managed pipeline version
- HTTP version
- ARR affinity



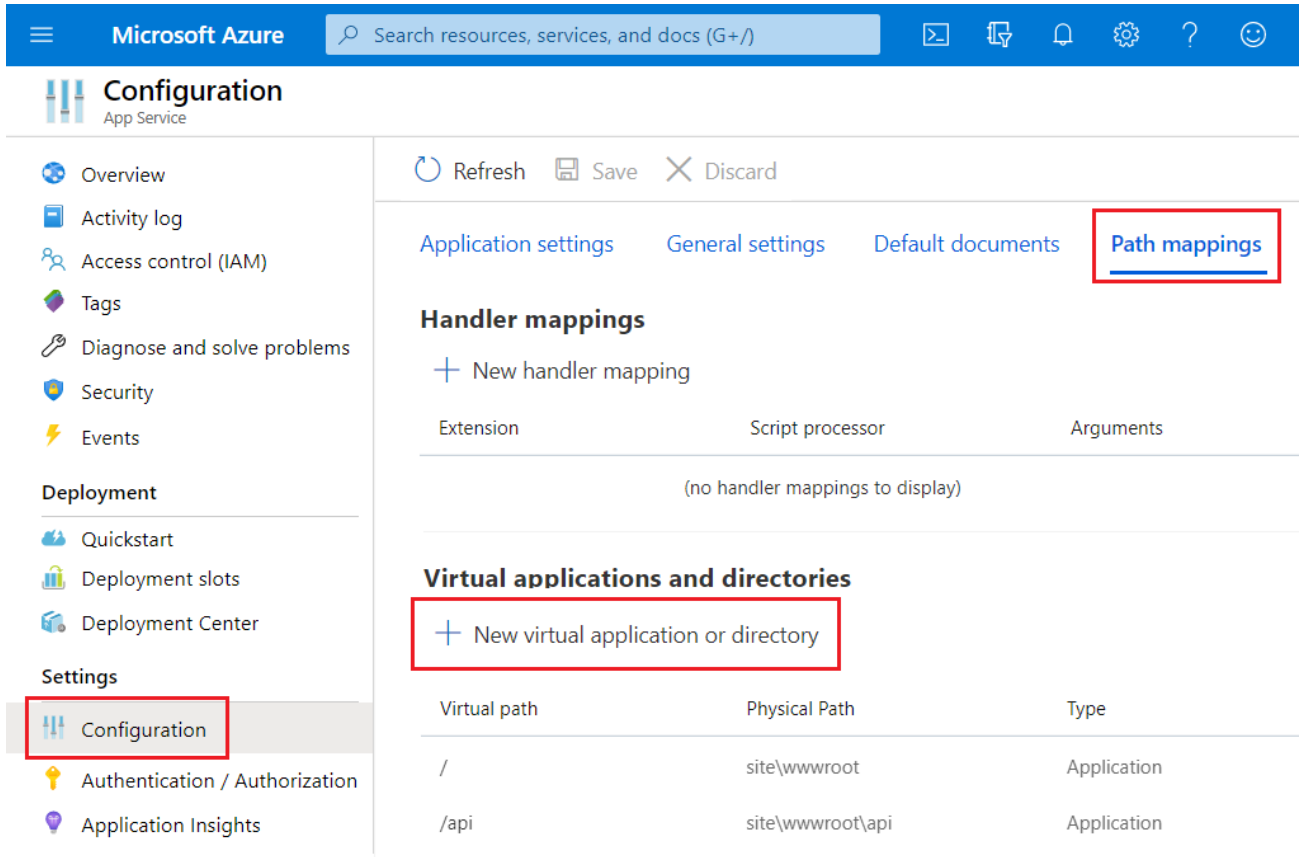
Configure path mappings

Linux and containerized apps

- Add custom storage for your containerized app.
- Containerized apps include all Linux apps and Windows and Linux custom containers running on App Service.

Windows apps (uncontainerized)

- Customize the IIS handler mappings and virtual applications and directories.
- Handler mappings enable adding custom script processors to handle requests for specific file extensions.



Enable diagnostic logging

Type	Platform	Description
Application logging	Windows, Linux	Logs messages generated by your application code. The messages are generated by the web framework you choose.
Web server logging	Windows	Raw HTTP request data in the W3C extended log file format.
Detailed error logging	Windows	Copies of the *.html* error pages that would have been sent to the client browser.
Failed request tracing	Windows	Detailed tracing information on failed requests
Deployment logging	Windows, Linux	Deployment logging happens automatically and there are no configurable settings for deployment logging.

Configure security certificates

- Options for adding certificates in App Service
  - Free App Service managed certificate
  - Purchase an App Service certificate
  - Import a certificate from Key Vault
  - Upload a private certificate
  - Upload a public certificate

Summary and knowledge check

In this module, you learned how to:

- Create application settings that are bound to deployment slots.
- Explain the options for installing SSL/TLS certificates for your app.
- Enable diagnostic logging for your app to aid in monitoring and debugging.
- Create virtual app to directory mappings.

1. Which app configuration settings category is used to set the language and SDK version?

2. What types of diagnostic logging are supported on the Linux platform?

Module 3: Scale apps in Azure App Service

Learning objectives

- Identify scenarios for which autoscaling is an appropriate solution
- Create autoscaling rules for a web app
- Monitor the effects of autoscaling

Introduction

- Autoscaling adjusts the number of available instances to meet the varying demands on your application
- Create rules to specify the conditions where instances should be added or removed
- Control costs

Examine autoscale factors

- Autoscaling adjusts available resources based on the current demand.
- Autoscaling performs scaling in and out, as opposed to scaling up and down.
- Monitors the resource metrics of a web app as it runs and detects when additional resources are required based on the set conditions.
- When should you consider autoscaling?
  - Autoscaling provides elasticity for your services.
  - Autoscaling improves availability and fault tolerance.
  - Autoscaling isn't the best approach to handling long-term growth.

Identify autoscale factors

Autoscale conditions

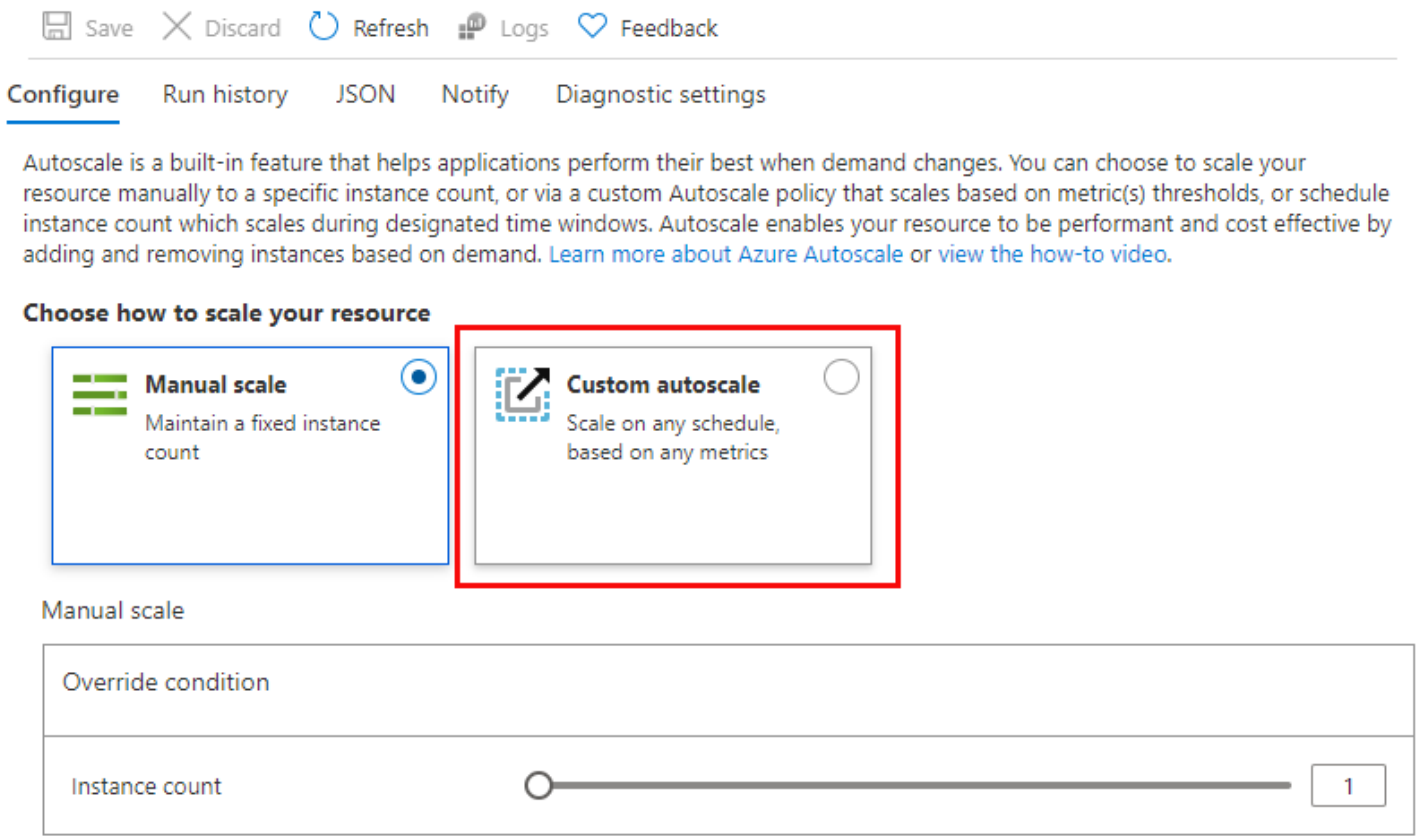
- Scale based on a metric, such as CPU usage or the length of a disk queue.
- Scale based on a schedule, such as a time of day or day of the week.
- Can create multiple conditions to handle complex needs.

Autoscale metrics

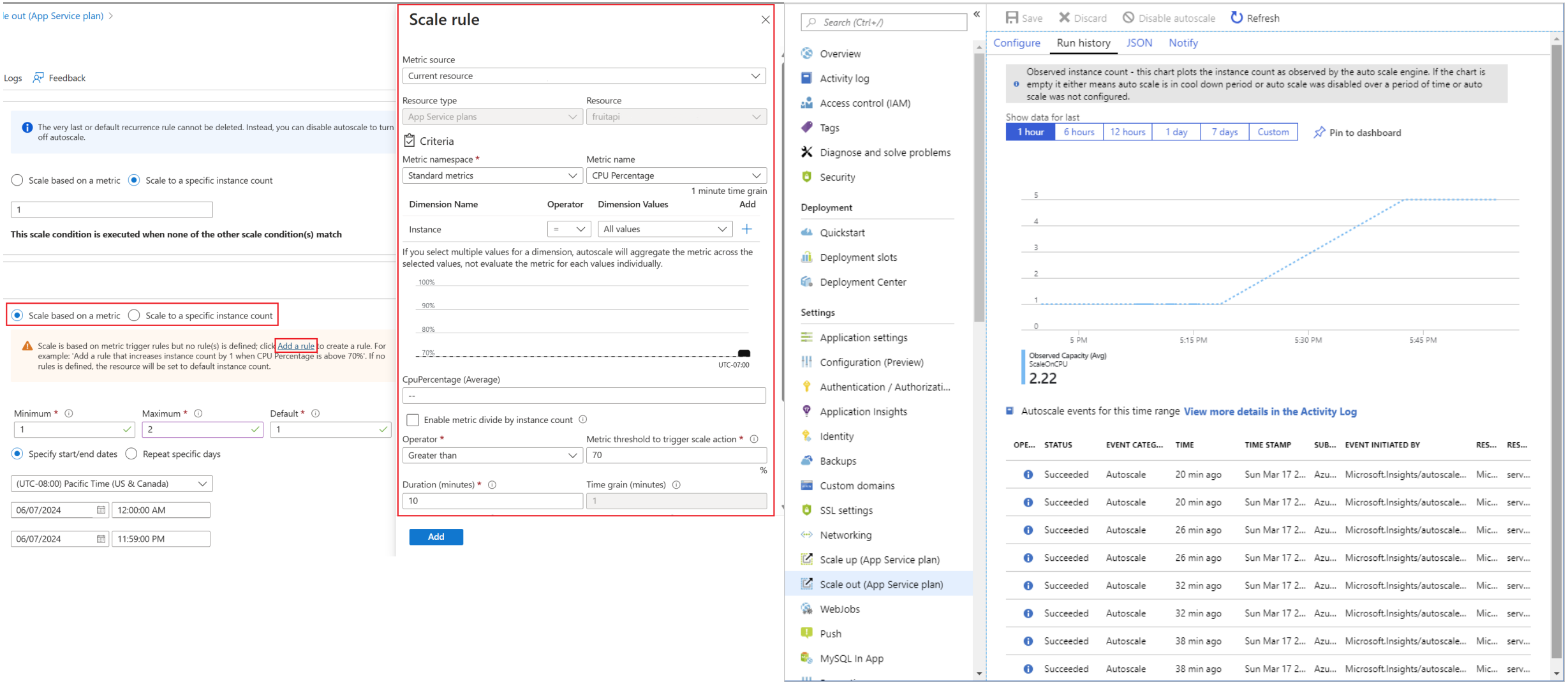
- Metrics are based on all instances of an app
- CPU percentage
- Memory percentage
- Disk queue length – outstanding I/O requests
- HTTP queue length – number of client requests
- Data in – number of bytes received
- Data Out – number of bytes sent

Enable autoscale in App Service

- Enable autoscaling
  - Not all pricing tiers support autoscaling
  - Some are only single instance or limited to manual scaling
- Add scale conditions
  - A default scale condition is created
  - Edit the default or create additional conditions
- Create scale rules
  - Conditions can contain one or more scale rules
  - Rules can be set based on calendar, metric, or both
- Monitor autoscaling behavior
  - View autoscale changes on the **Run history** chart
  - Tracks number of instances and which condition triggered the change



Enable autoscale in App Service



Explore autoscale best practices

- Ensure the maximum and minimum values are different and have an adequate margin between them
- Choose the appropriate statistic for your diagnostics metric
- Choose the thresholds carefully for all metric types
- Check for conflicts when multiple rules are configured in a condition
- Always select a safe default instance count
- Configure autoscale notifications

Summary and knowledge check

In this module, you learned how to:

- Identify scenarios for which autoscaling is an appropriate solution
- Create autoscaling rules for a web app
- Monitor the effects of autoscaling

1. How would you describe autoscaling?
2. Can you describe a scenario that is a suitable candidate for autoscaling?

Module 4: Explore Azure App Service deployment slots

Learning objectives

- Describe the benefits of using deployment slots
- Understand how slot swapping operates in App Service
- Perform manual swaps and enable auto swap
- Route traffic manually and automatically

Introduction

- Deployment slots enable you to preview, manage, test, and deploy different development environments.
- Deployment slots are live apps with their own host names.
- App content and configuration elements can be swapped between two slots.

Explore staging environments

- You can use a separate deployment slot instead of the default production slot when you're running in the **Standard**, **Premium**, or **Isolated** App Service plan tier.
- Deploying to a non-production slot has the following benefits:
  - You can validate app changes in a staging deployment slot before swapping it with the production slot.
  - Deploying an app to a slot first and swapping it into production makes sure that all instances of the slot are warmed up before being swapped into production.
  - After a swap, the slot with previously staged app now has the previous production app.

Examine slot swapping

When swapping slots, App Service does the following

1. Applies the following settings from the target slot to all instances of the source slot:
   - Slot-specific app settings and connection strings, if applicable.
   - Continuous deployment settings, if enabled.
   - App Service authentication settings, if enabled.
2. Wait for every instance in the source slot to complete its restart.
3. If local cache is enabled, trigger local cache initialization by making an HTTP request to the application root ("/") on each instance of the source slot.
4. If auto swap is enabled with custom warm-up, trigger Application Initiation by making an HTTP request to the application root ("/") on each instance of the source slot.
5. If all instances on the source slot are warmed up successfully, swap the two slots by switching the routing rules for the two slots.
6. Now that the source slot has the pre-swap app previously in the target slot, perform the same operation by applying all settings and restarting the instances.

Swap deployment slots

- Swap deployment slots on your app's Deployment slots page and the Overview page.
- Configure auto swap
- Swap with preview
- Specify a custom warm-up
- Roll back and monitor a swap

Route traffic in App Service

Route production traffic automatically

- Go to your app's resource page and select **Deployment slots**.
- In the **Traffic %** column of the slot you want to route to, specify a percentage (between 0 and 100) to represent the amount of total traffic you want to route.

Route production traffic manually

- In addition to automatic traffic routing, App Service can route requests to a specific slot.
- This is useful when you want your users to be able to opt in to or opt out of your beta app.
- To route production traffic manually, you use the **x-ms-routing-name** query parameter.

Summary and knowledge check

In this module, you learned how to:

- Describe the benefits of using deployment slots
- Understand how slot swapping operates in App Service
- Perform manual swaps and enable auto swap
- Route traffic manually and automatically

1. What is the default routing rule applied to new deployment slots?

2. Do all configuration elements follow the content across a swap?

Discussion and lab

Group discussion questions

- What are deployment slots and how can they be used?
- How does autoscale work in App Service? How would you scale-up an application?
- Can you name the different options to deploy apps to App Service both manually and automatically?

Lab 01: Build a web application on Azure platform as a service offerings

In this lab, you will explore how to create a web application on Azure by using the PaaS model. After the web application is created, you will learn how to upload existing web application files by using the Apache Kudu zip deployment option. You will then view and test the newly deployed web application.

http://aka.ms/az204labs

- Exercise 1: Build a backend API by using Azure Storage and the Web Apps feature of Azure App Service
- Exercise 2: Build a front-end web application by using Azure Web Apps

End of presentation