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Post Graduate Program in Cloud Computing

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PG CC - Microsoft Azure Architect Technologies: AZ:303

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Implement an Application Infrastructure

Learning Objectives

By the end of this lesson, you will be able to:

- Create and configure Azure App Service
- Create an App Service Web App for containers
- Create and configure an App Service plan
- Configure networking for an App Service

Learning Objectives

By the end of this lesson, you will be able to:

- Create and manage deployment slots
- Implement Logic Apps
- Implement Azure Functions

A Day in the Life of an Azure Architect

You are working as an Architect in an organization that is looking for an Azure solution that can be used to host its applications. The runtime stack for this application could be .net, python, ruby, java, and node.

You have been asked to provide a solution to build, deploy, and scale a full-fledged custom web-based software solution as it owns small and medium-sized businesses in a variety of markets. You also need to consider the frequent updates the organization will be pushing to the application.

The organization is also looking for a solution that will allow you to develop and operate automated workflows that combine your apps, data, services, and systems. You'll use this logic app to create highly scalable integration solutions for your company quickly.

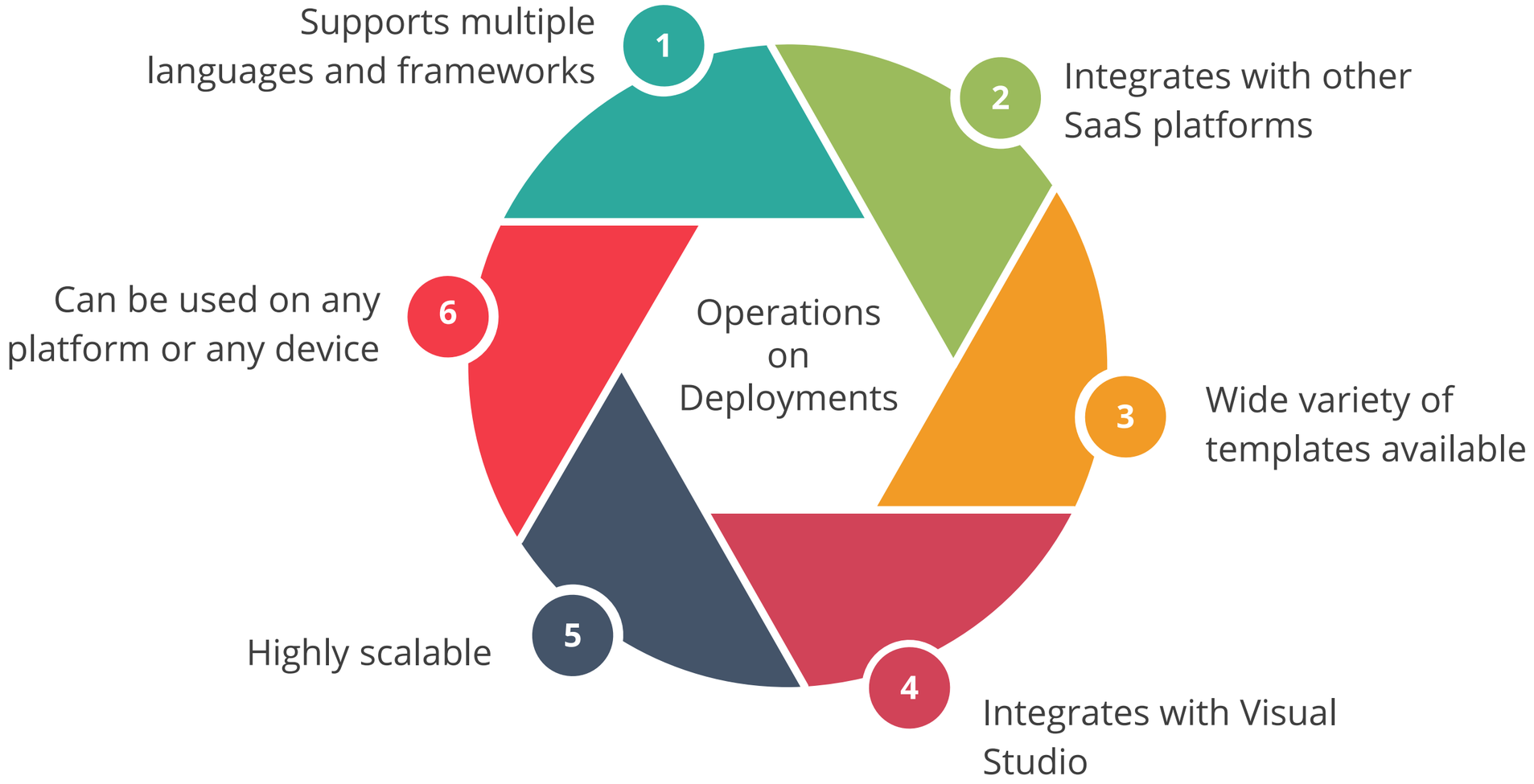
To achieve all of the above along with some additional features, you will be learning a few concepts in this lesson that will help you find a solution for the given scenario.

Azure App Services

Azure App Service Overview

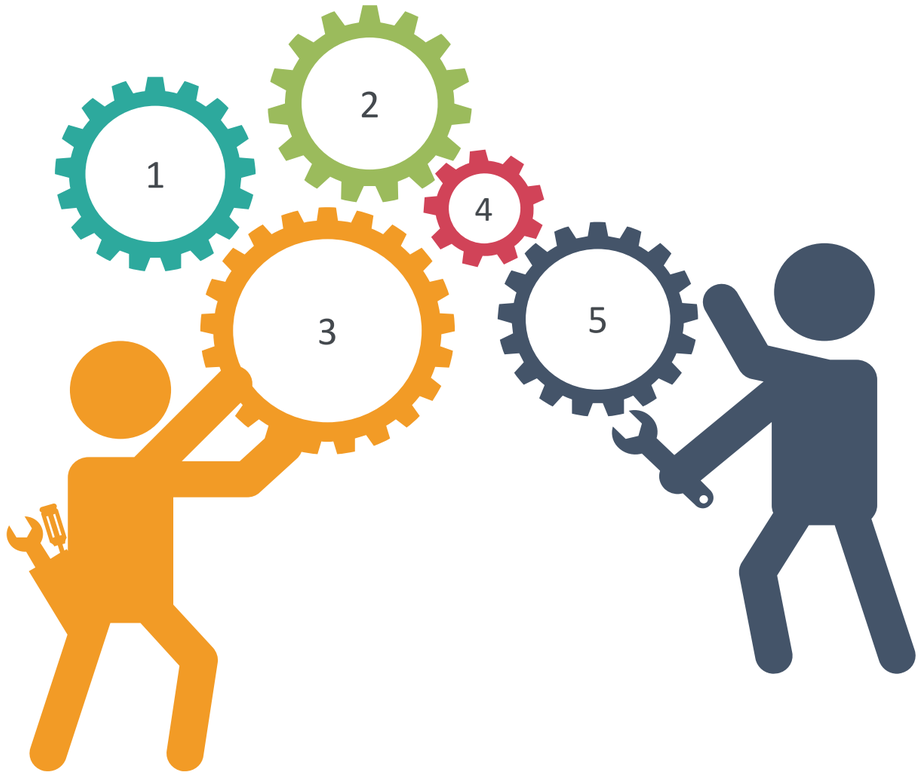
The Azure App Service is a Platform-as-a-service (PaaS) offering from Microsoft that allows the users to build, deploy, and scale web applications.

Benefits of Azure App Service



App Deployment Options

Azure App Service facilitates continuous integration and continuous deployment.



- Integrates with Azure DevOps
- Deploys using VS Code
- Deploy using source control systems like GitHub, Bitbucket or local Git
- Deploy using OneDrive
- Deploy using FTP

Web App for Containers

Azure Container Registry

Container Registry to create a private image registry and to automate tasks such as re-deploying an app when an image is rebuilt.

Create a Container Registry

Run the following command:

```
az acr create --name myregistry --resource-group
mygroup --sku standard --admin-enabled true
```

Build and store image in Container Registry

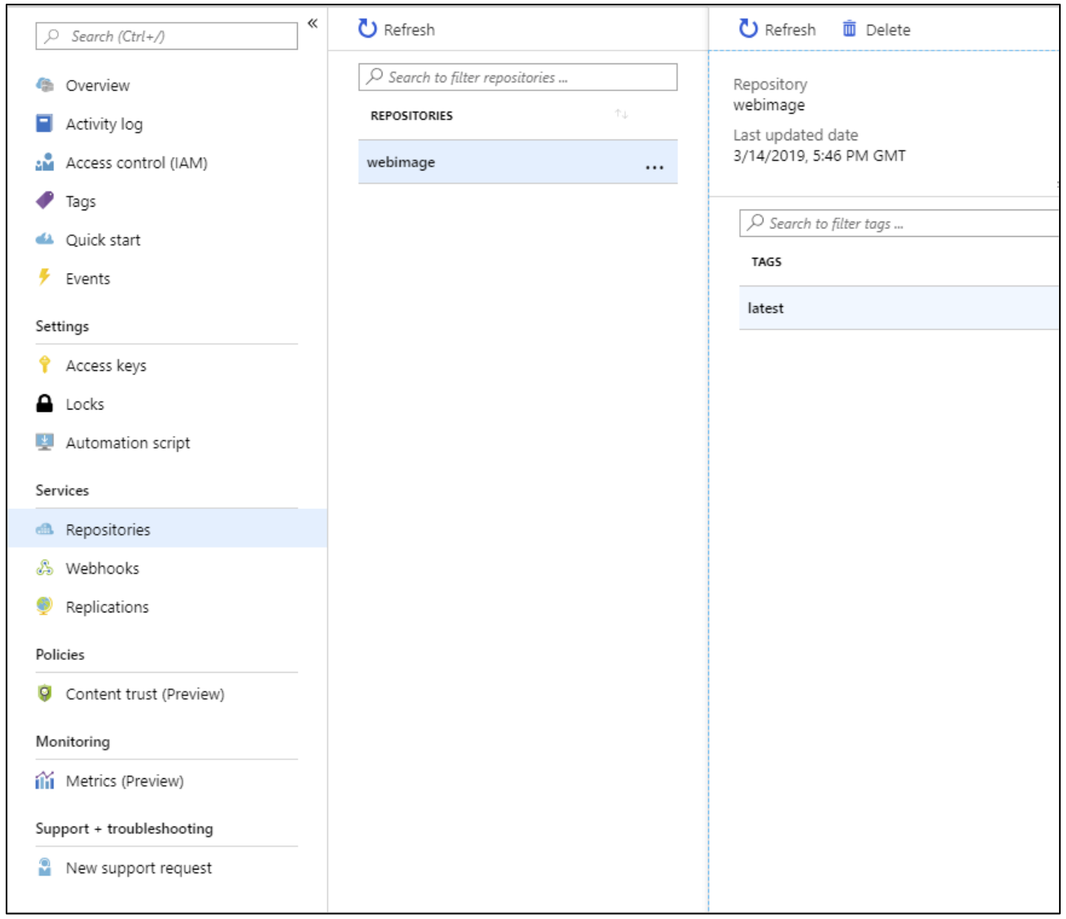
Run the following command:

```
az acr build --file Dockerfile --registry myregistry
--image myimage
```

Azure Container Registry

To build an image using Azure Container Registry:

1. Create a registry in Azure Container Registry
2. Build a Docker image and upload it to Azure Container Registry
3. Examine the Container Registry



Deploy a Web App from a Docker Image

Azure App Service provides the hosting environment for an Azure-based web app. It can be configured to retrieve the image of the web app from a repository in Azure Container Registry.

To create a new web app, use the Docker image stored in Azure Container Registry:

Property	Value
Subscription	The target Azure subscription in which you are allowed to create and manage resources.
Resource Group	A resource group name
Name	A globally unique name for the web app you are deploying
Publish	Docker Image
OS	Linux
App Service Plan	Use the plan

Assisted Practice

Create an App Service for Container

Duration: 10 Min

Problem Statement:

You are given a project to create an App Service for Container so that your apps will be updated each time your source code changes.

Assisted Practice: Guidelines

Steps to create an App Service for Container are:

1. Login to your Azure portal
2. Click on Create a resource
3. Search and Select Web App
4. Create Web App by providing necessary details

App Service Plan

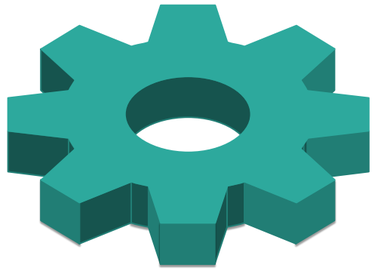
Azure App Service Plans

Azure app service plan defines the set of compute resources for web apps.

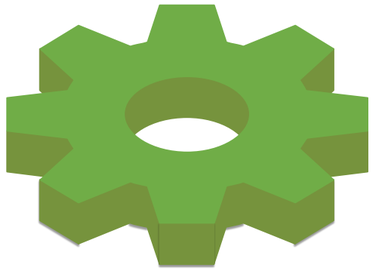
- Compute resources are similar to a server farm in a traditional web hosting environment
- App Service plan determines capabilities and resources available for its web apps
- App Service plans for web apps can be shared

Azure App Service Plans

Assign your app to an App Service plan when:



The app is resource intensive



You want to scale the app independently of other apps

The app needs resources in a different geographical region

Note:

- Multiple apps can be hosted in a single service plan
- Apps share the resources in the service plan
- There can be multiple app service plans in a resource group

Pricing Tiers for App Service Plan

The pricing table for Azure App Service plans is shown below:

	Free Try for free	Shared Environment for dev/test	Basic Dedicated environment for dev/test	Standard Run production workloads	Premium Enhanced performance and scale	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
Maximum instances	–	–	Up to 3	Up to 10	Up to 30*	Up to 100
Custom domain	–	Supported	Supported	Supported	Supported	Supported
Auto Scale	–	–	–	Supported	Supported	Supported
Hybrid Connectivity	–	–	Supported	Supported	Supported	Supported
Virtual Network Connectivity	–	–	–	Supported	Supported	Supported
Private Endpoints	–	–	–	–	Supported	Supported
Compute Type	Shared	Shared	Dedicated	Dedicated	Dedicated	Isolated
Pay as you go price	Free	$0.013/hour	$0.075/hour	$0.10/hour	$0.20/hour	$0.40/hour

Source: https://docs.microsoft.com/

Autoscale Apps

Autoscale affects all apps in the service plan. It features allow you to scale out and in the number of instances of your app service plan based on schedules you set or metrics you define.

Scale In or Out

Basic Tier

You can scale up to 3 instances

Premium Tier

We can scale up to 20 instances

Standard Tier

We can scale up to 10 instances

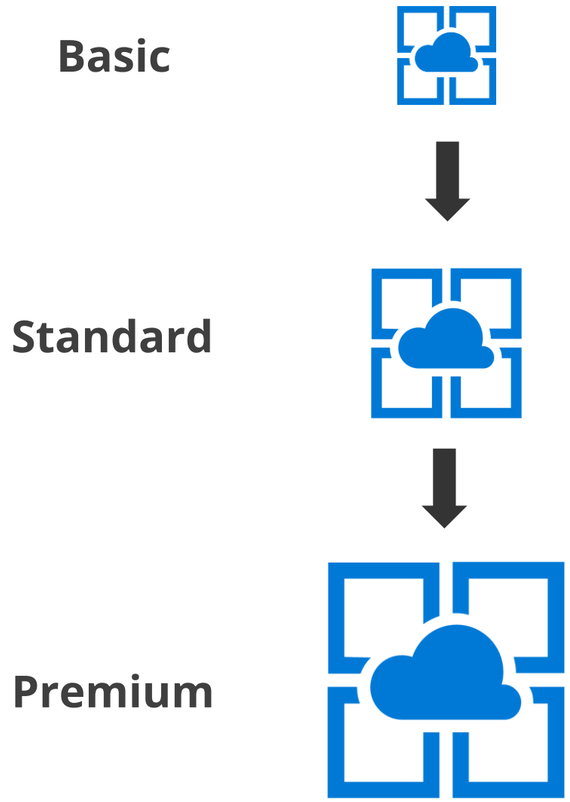
Isolated (App Service Environment)

We can scale up to 100 instances

Autoscale Apps

Scale Up or Down

- Increase the CPU, memory, disk space, staging slots, and so on.
- In this, we move up the pricing tier



Assisted Practice

Azure App Service Plan

Duration: 10 Min

Problem Statement:

You've been assigned a project to configure an Azure App service plan, which defines a set of computing resources for a web app to run on. In traditional web hosting, these computation resources are similar to a server farm. Several apps can be set up to share the same computational resources.

Assisted Practice: Guidelines

Steps to configure Azure App Service plan are:

1. Login to your Azure portal
2. Click on Create a resource
3. Search and Select Web App
4. Provide the instance details before configuring the App Service plan
5. In the App Service Plan section, configure the plan

Deployment Slots

Integrate an App with an Azure Virtual Network

Azure App Service offers the following types of Net Integration:

Multi Tenant systems that support the full range of excludes isolated pricing plans

App Service Environment that deploys into your VNet, and supports isolated pricing plan apps

Integrate an App with an Azure Virtual Network

You can use the following methods to integrate an app with Azure Virtual Network (VNet):

Regional VNet Integration

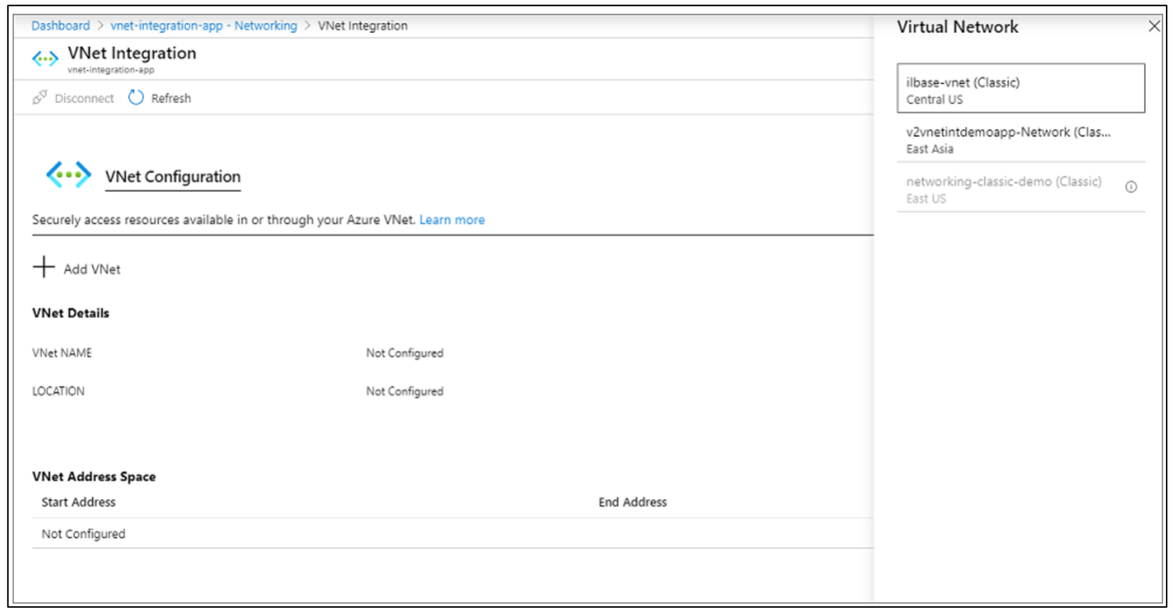
- When user connect to Azure Resource Manager virtual networks in the same geographical region.
- To integrate your app with Azure Resource Manager VNet in the same geographical region, your app must use a dedicated subnet.

Gateway-required VNet Integration

- When user integrate the app with a VNet in a different geographical region or to a classic virtual network in the same region.
- A user must use an Azure VNet gateway provisioned in the target VNet.

Enable VNet Integration

To enable VNet integration, perform the following steps:



1. Go to the Networking UI in the App Service portal
2. Under VNet Integration, select Click here to configure
3. Select Add VNet

Regional VNet Integration

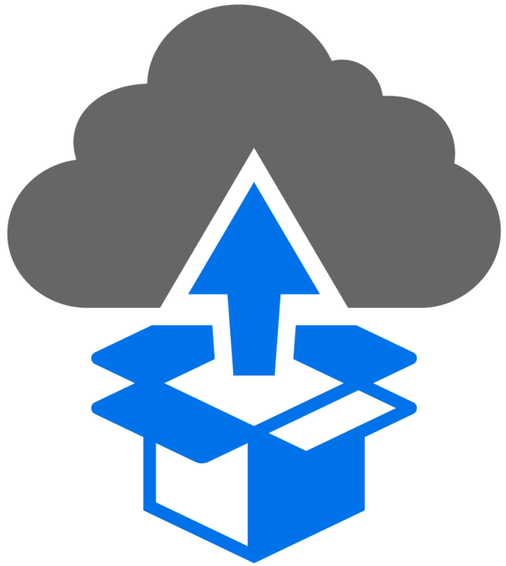
Using regional VNet Integration enables your app to access:

- Resources in a VNet in the same region as your app
- Resources in VNets peered to the VNet your app is integrated with
- Service endpoint secured services
- Resources across Azure ExpressRoute connections
- Resources in the VNet your app integrated with
- Private endpoints

Create and Manage Deployment Slots

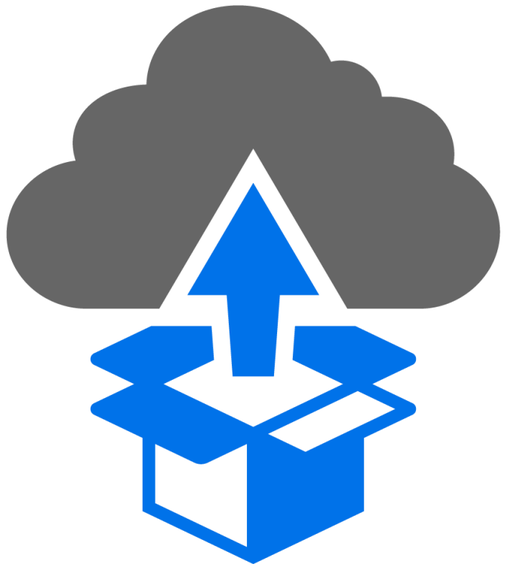
Deployment Slots

In Azure, we can deploy to the deployment slots, test your app, and then release to production. It is recommended to deploy apps to the testing environment before deploying to the production environment.



Deployment Slots

Deployment slots have the following characteristics:



- A method to support rapid development
- Not available in Free, Shared, or Basic plans
- The default deployment slot is the production environment
- DEV, QA, and UAT environments
- Each slot has its own hostname and configuration

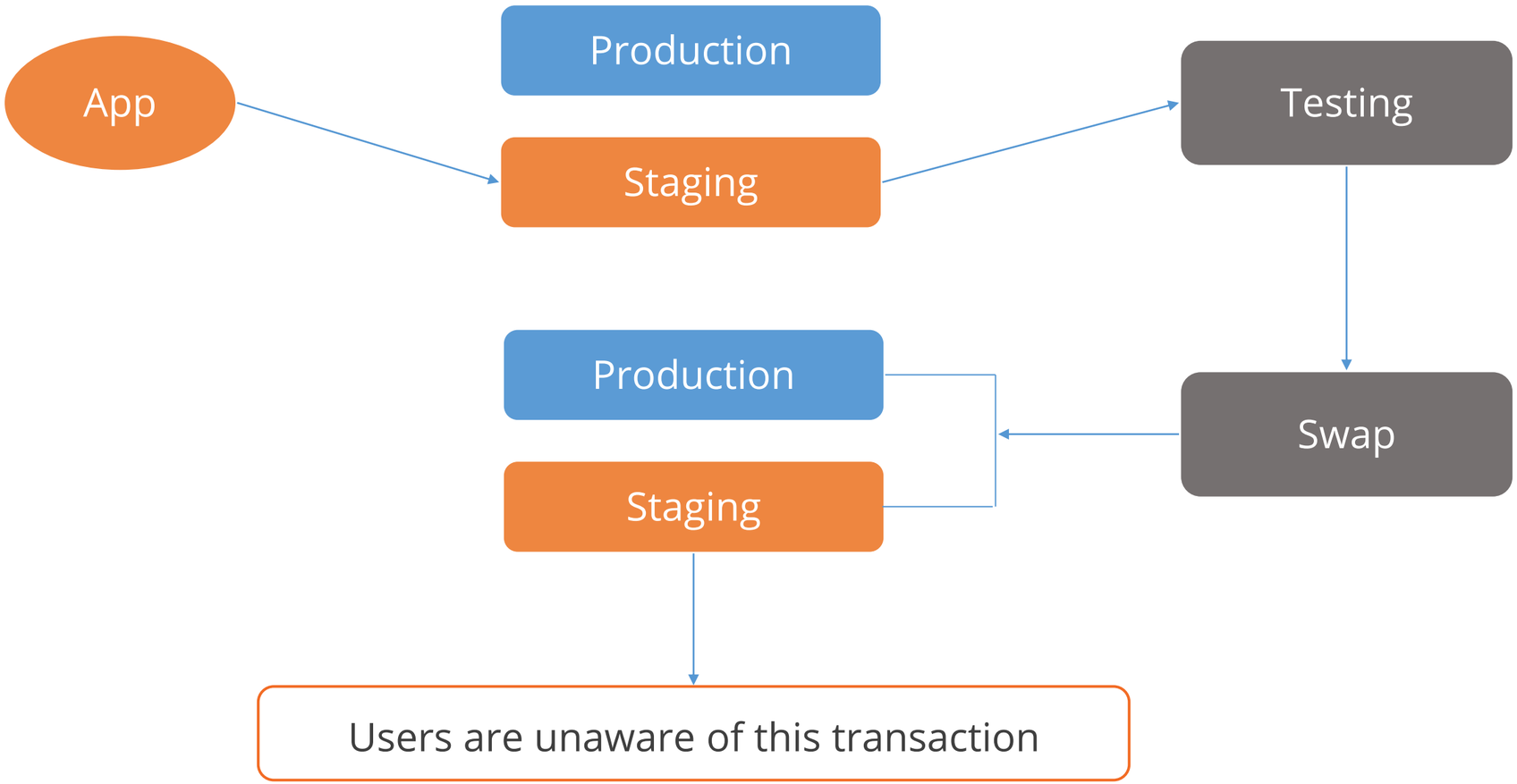
Slots and Tiers

The number of available deployment slots depend on the pricing tier of the App Service plan:

Tier	Maximum staging slots
Free	0
Shared	0
Basic	0
Standard	5
Premium	20
Isolated	20

Deployment Slots Workflow

The number of available deployment slots depend on the pricing tier of the App Service plan:



What Is Swapped and What Is Not Swapped

Settings that Swap

General settings

App settings

Connection strings

Handler mappings

Monitoring settings

Diagnostic settings

WebJobs content

Settings that Don't Swap

Custom domain names

SSL certificates and bindings

Scale settings

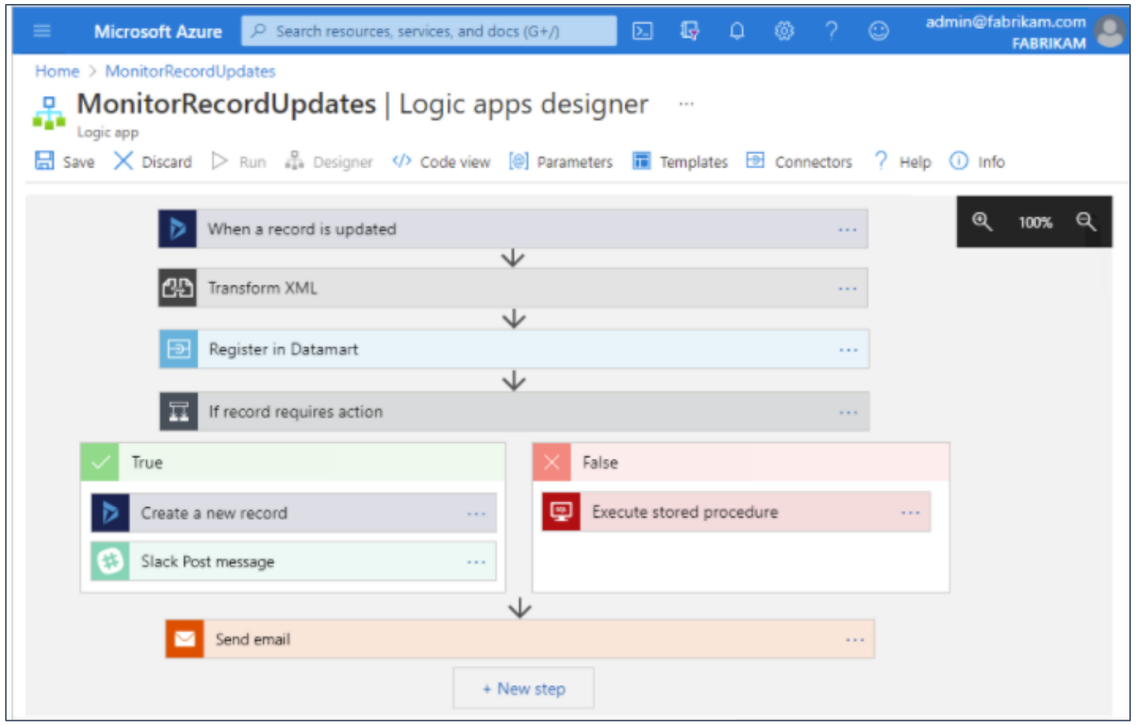
Publishing endpoints

WebJobs schedulers

Azure Logic Apps

Azure Logic App

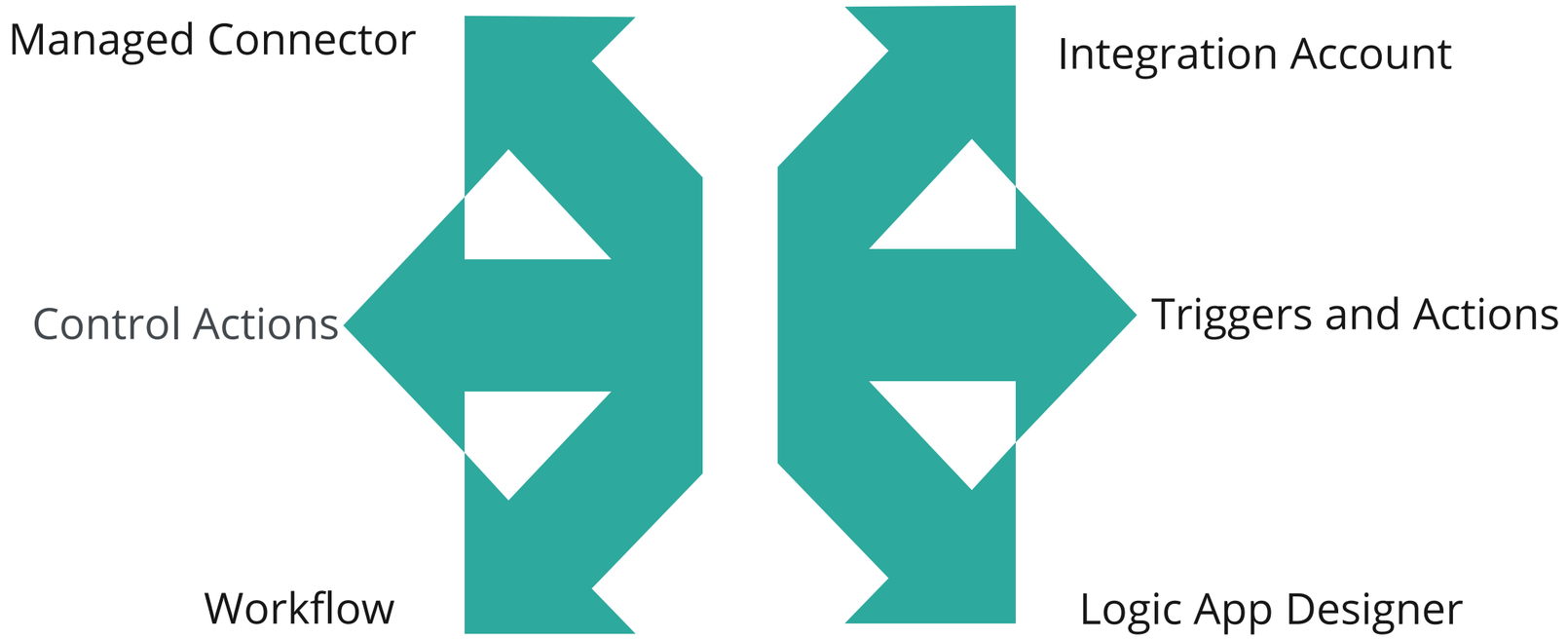
A cloud platform used to schedule, automate, and orchestrate tasks, business processes, and workflows.



It’s used to integrate apps, data, systems, and services across enterprises or organizations.

Azure Logic App: Key Terms

Key terminologies used while using Azure Logic app are:



Manager Connector

A connector is a component that provides an interface to an external service.

Example

- Twitter connector allows you to send and retrieve tweets
- Office 365 Outlook connector lets you manage your email, calendar, and contacts

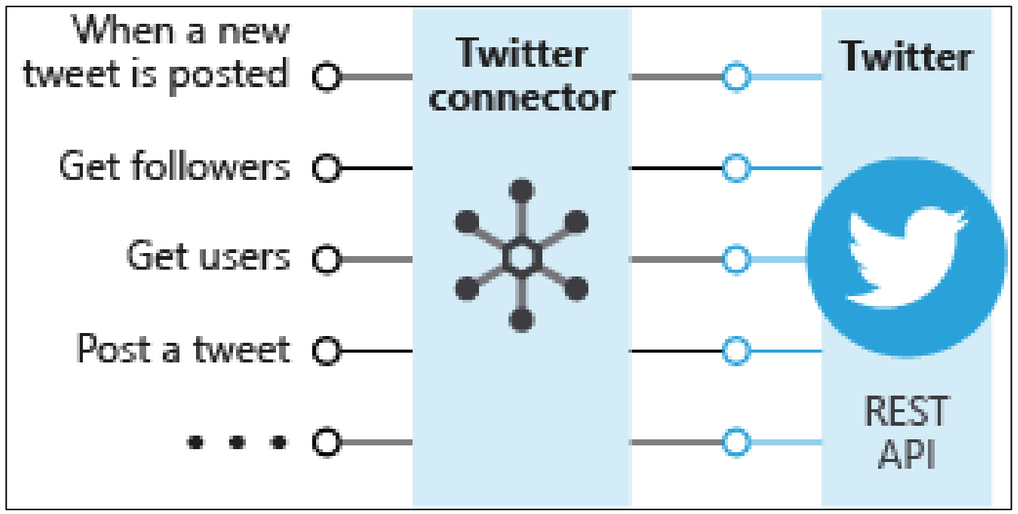
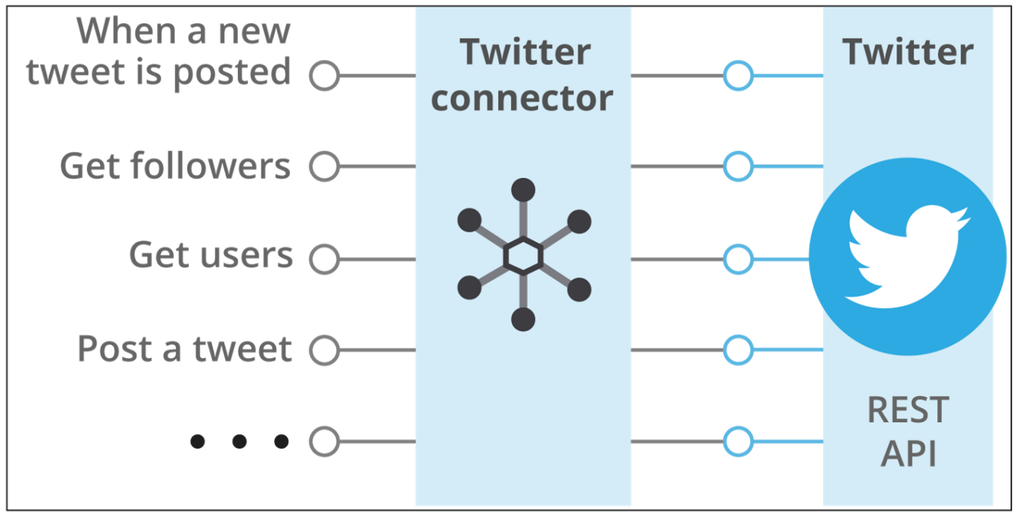


image source: https://docs.microsoft.com/en-in/

Connector

A user can write custom connectors to access services that don't provide pre-built connectors.



The services must have a Representational state transfer (REST), or Simple object access protocol (SOAP) Application programming interface (API).

image source: https://docs.microsoft.com/en-in/

Triggers and Actions

Triggers

- A trigger is an event that occurs when a specific set of conditions is satisfied.
- They are activated automatically,

For example, when a timer expires or data becomes available.

Actions

- An action is an operation that executes a task in your business process.
- It runs when a trigger is activated or another action is completed.

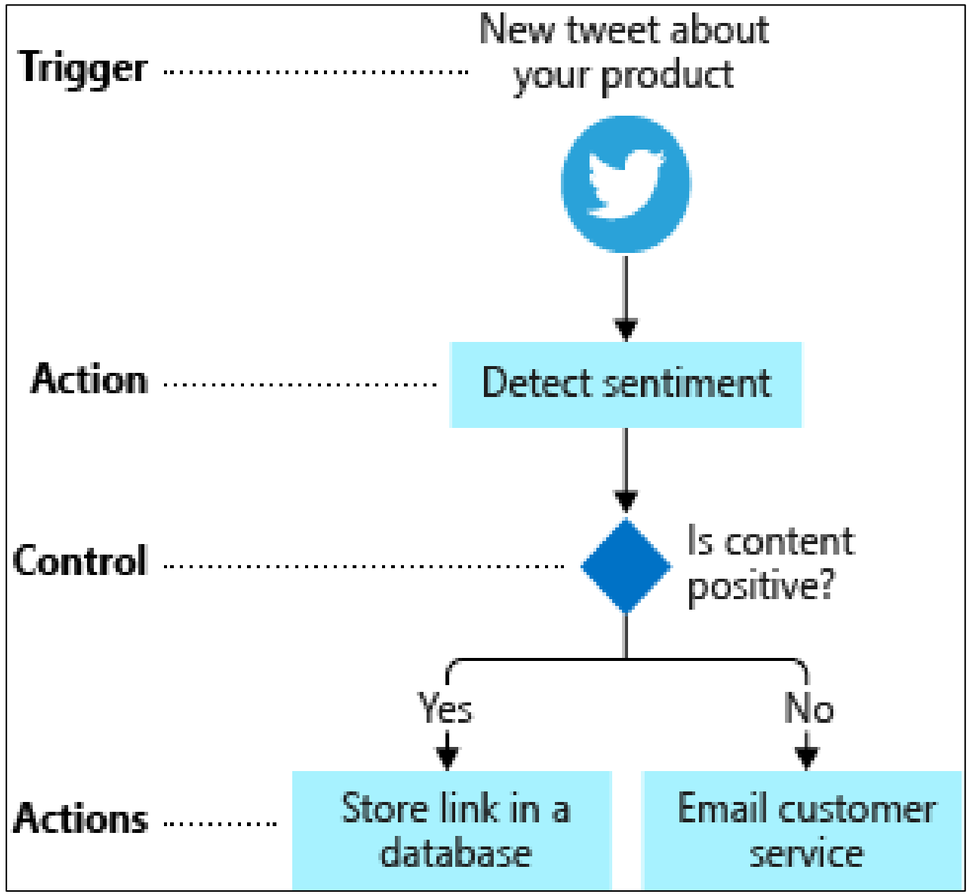


image source: https://docs.microsoft.com/en-in/

Control Actions

Control actions are special actions built-in to Logic Apps that provide the following control constructs:

- Condition statements controlled by a Boolean expression
- Switch statements
- For, Each, and Until loops
- Unconditional Branch instructions

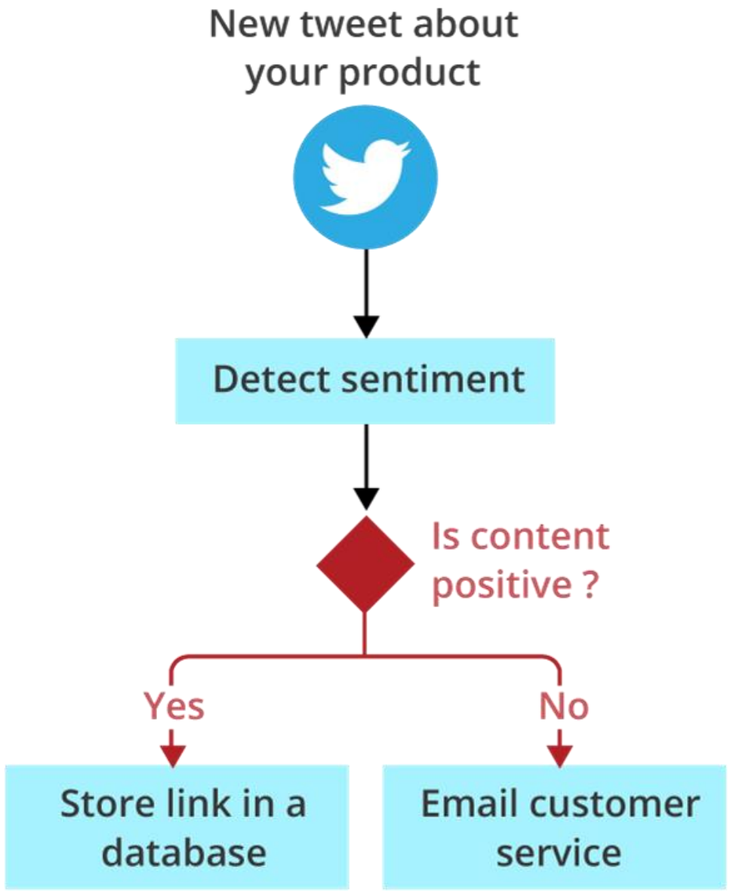


image source: https://docs.microsoft.com/en-in/

Logic Apps Designer

Logic apps designer is a graphical tool for creating workflows.

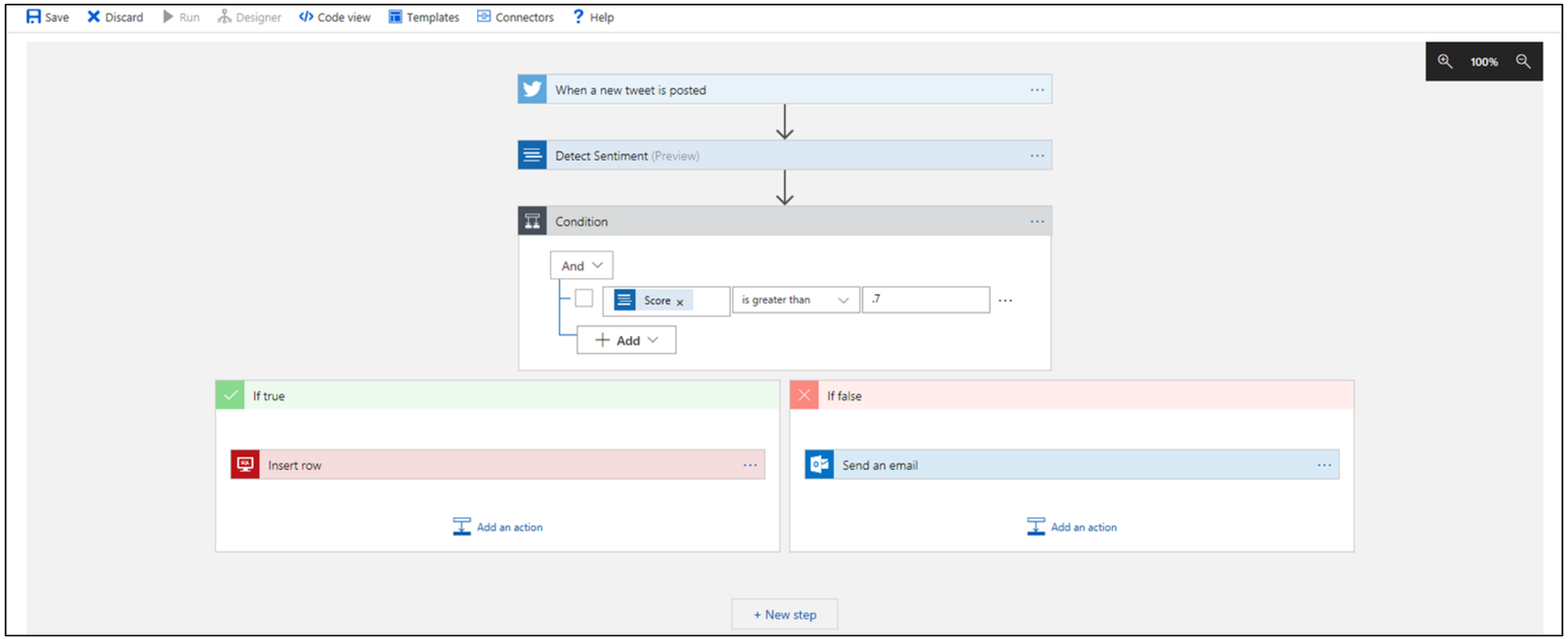


image source: https://docs.microsoft.com/en-in/

Assisted Practice

Azure Logic App

Duration: 10 Min

Problem Statement:

You are given a project to create an Azure Logic App that will allow you to develop and operate automated workflows that combine your apps, data, services, and systems. You'll use this logic app to create highly scalable integration solutions for your company quickly.

Assisted Practice: Guidelines

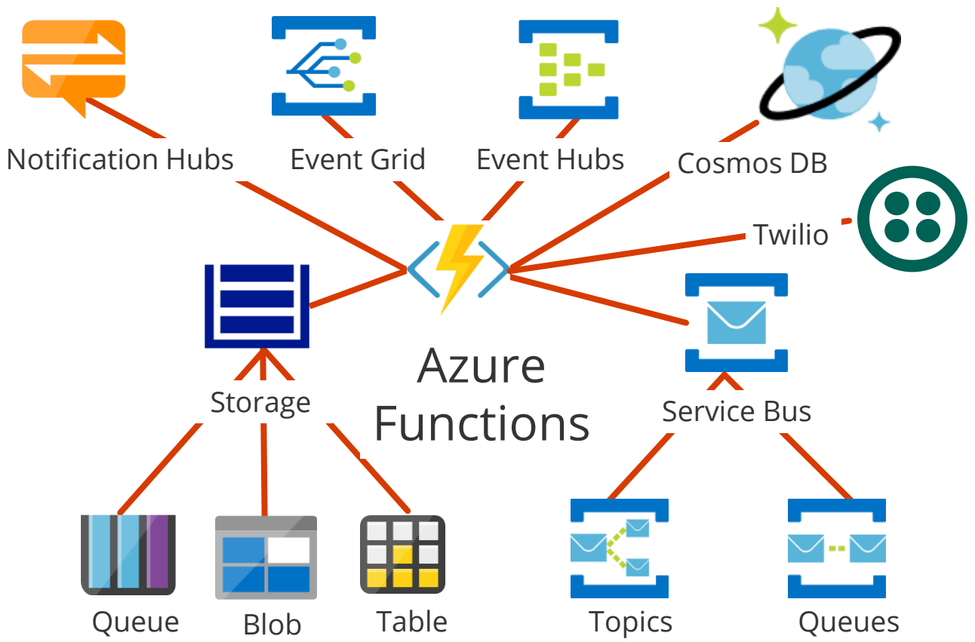
Steps to configure Azure Logic App are:

1. Login to your Azure portal
2. Search and select Logic Apps
3. Select Add on the Logic Apps page
4. Provide the details and create Logic App

Azure Function

Azure Functions

It allows a user to run small pieces of code (called **functions**) without worrying about application infrastructure.



Azure Functions are created in a **Function App**.

Features of Azure Functions

- Support a range of programming languages:

  C#, F#, Node.js, Python, PHP, batch, bash, or any executable.
- Pay-per-use pricing model
- Support for custom dependencies:

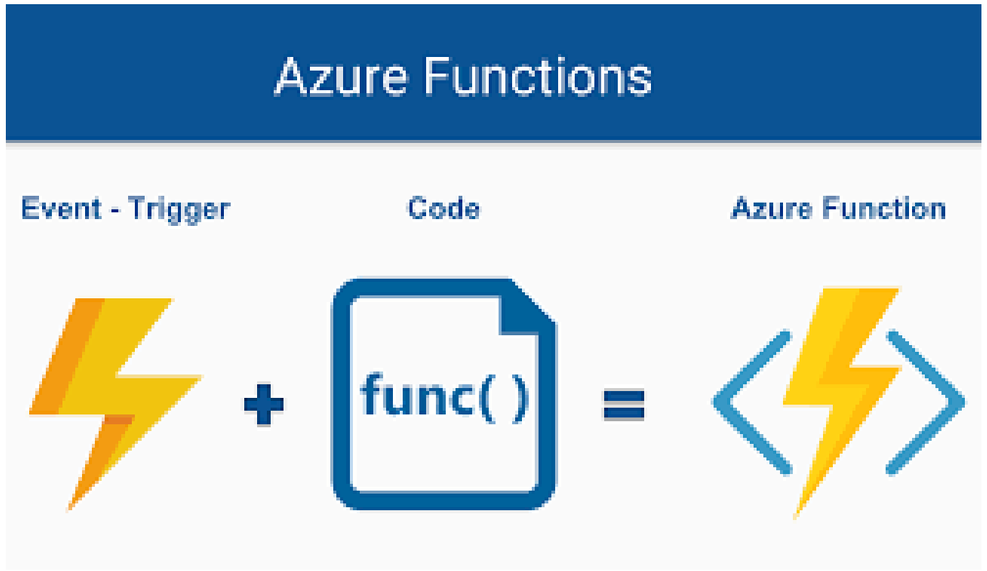
  NuGet and NPM-based libraries.
- Integration with the most popular OAuth providers:

  Azure AD, Facebook, Google, Twitter, and Microsoft Account.

Features of Azure Functions

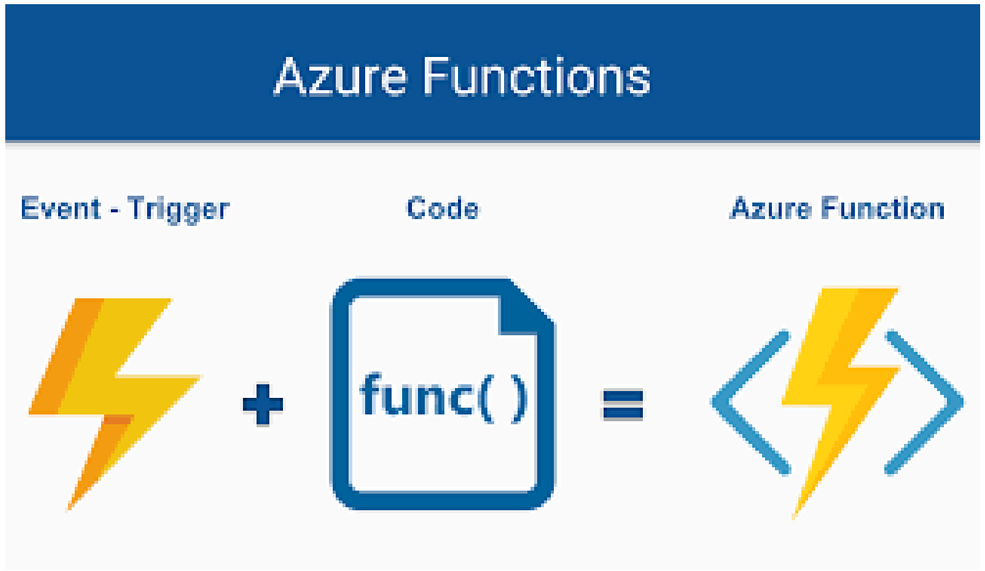
- Flexible development:
  - Directly from the Azure portal
  - Through continuous integration with GitHub, VSTS, and other supported development tools.
- Open-source: available on GitHub.
- Ease of code reuse:
  - Developers can reuse their functions in multiple applications.

Azure Functions Use cases



- Run code based on HTTP requests
- Schedule code to run at predefined times
- Process new and modified:
  - Azure Cosmos DB documents
  - Azure Storage blobs
  - Azure Queue storage messages

Azure Functions Use cases



- Respond to Azure Event Grid events by using subscriptions and filters
- Respond to high volumes of Azure Event Hubs events
- Respond to Azure Service Bus queue and topic messages

Assisted Practice

Azure Function App

Duration: 10 Min

Problem Statement:

You've been assigned the task of creating an Azure Function App that groups functions into logical units for simpler management, deployment, scalability, and resource sharing.

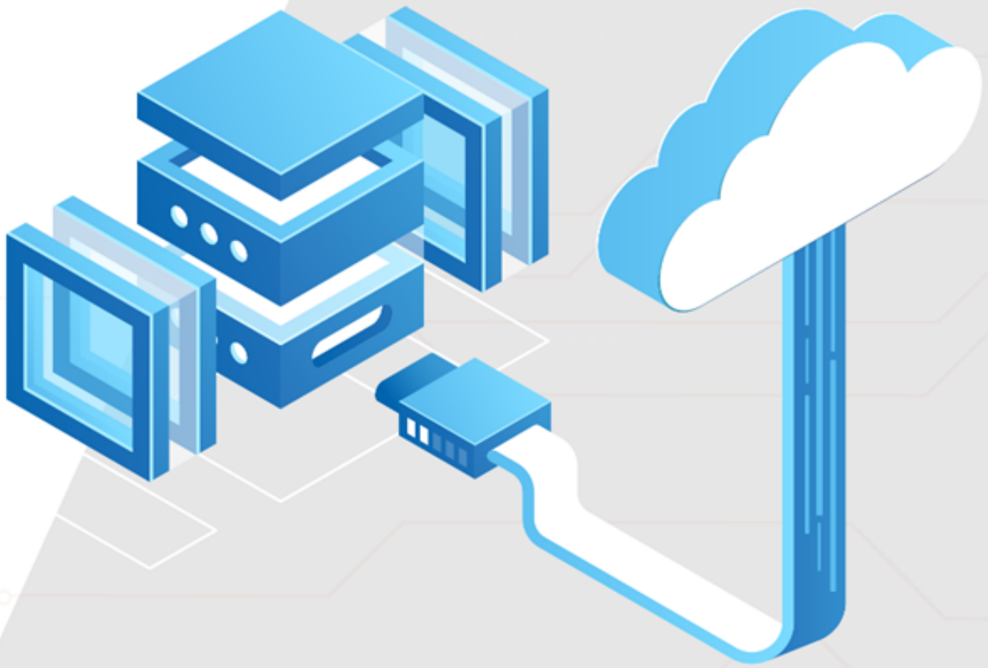
Assisted Practice: Guidelines

Steps to configure Azure Function App are:

1. Login to your Azure portal
2. Click on Create a resource
3. Select Function App from Compute
4. Configure the Function App settings and create it

Key Takeaways

- The Azure App Service is a PaaS offering from Microsoft that allows the users to build, deploy, and scale a web application.
- Azure App Service provides the hosting environment for an Azure-based web app.
- Azure App Service has Multi Tenant systems and app service environment variations for VNet Integration.
- Azure Logic app is used to integrate apps, data, systems, and services across enterprises or organizations.
- Azure Functions allows user to run small pieces of code without worrying about application infrastructure.



Thank you