Exam Alert: Connect To and Consume Azure Services and Third-Party Services

PREPARING FOR THE EXAM

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Up Next:
Objectives for the Exam

Objectives for the Exam

Consume Azure and Third-Party Services

25-30%

Develop an App Service Logic App	**Implement API Management**
Develop Event-based Solutions	**Develop Message-based Solutions**

Develop an App Service Logic App

Create a Logic App

Create a custom connector for Logic Apps

Create a custom template for Logic Apps

Implement API Management

Create an APIM instance

Configure authentication for APIs

Define policies for APIs

Develop Event-based Solutions

Implement solutions that use Azure Event Grid

Implement solutions that use Azure Notification Hubs

Implement solutions that use Azure Event Hub

Develop Message-based Solutions

Implement solutions that use Azure Service Bus

Implement solutions that use Azure Queue Storage queues

Review Developing an App Service Logic App

"**Azure Logic Apps** is a cloud service that helps you schedule, automate, and orchestrate tasks, business processes, and workflows when you need to integrate apps, data, systems, and services across enterprises or organizations"

Microsoft Azure Documentation

Areas of Focus

Authoring Approaches

Key Terms

Enterprise Integration Pack

Logic App Authoring Approaches

Azure Portal

IDE
(Visual Studio, Visual Studio Code)

CLI
(Azure CLI, PowerShell)

Key Terms

Workflow

Trigger

Action

Connector

Connector Types

Built-in: These connectors enable Logic Apps to access Azure services

Managed: These connectors are created and managed by Microsoft

Custom: You can create custom connectors to integrate with your internal systems

Enterprise Integration Pack

Microsoft provides tools to integrate Logic Apps with common enterprise tools

Pack supports common enterprise connectors that support:

- Electronic Data Interchange (EDI)
- Enterprise Application Integration (EAI)

Utilizes an integration account to store artifacts

Review API Management Implementation

Areas of Focus

Service Tiers

Caching

Access Restriction and Authentication

Policy Definition

API Management Pricing Tiers

Consumption	Developer	Basic
Standard	Premium	Isolated*

API Management Cache Types

Internal

Cache provided within the API Management service

External

Redis compatible cache outside of API Management, such as Azure Cache for Redis

API Management Caching

Internal cache is limited in size based on the API Management tier

Internal cache is not available on the consumption tier for API Management

Both types of caching are configured in the API Management policies

Controlling Access to API's

Access Restriction

Limiting access to an API based on specific settings

Authentication

Verify credentials for a caller of an API

Access Restrictions

Checking an HTTP header for existence and value

Limit call rate by subscription and key

Restrict by IP address

Usage quotas per key

Validate JWT

Authentication Policies

Basic Auth

Client Certificate Auth

Managed Identity Auth

API Management Policy

```
<policies>
    <inbound>
        <base />
        <cache-lookup vary-by-developer="false"
          vary-by-developer-groups=“false” caching-type="internal">
            <vary-by-query-parameter>v</vary-by-query-parameter>
        </cache-lookup>
    </inbound>
    <outbound>
        <cache-store duration="60" />
        <base />
    </outbound>
</policies>
```

Review Policy Structure

Authentication and JWT handling

Cache configuration

Access restrictions

Review Event-based App Development

Areas of Focus

Understanding Messages and Events

Selecting an Event-based Service

Comparing Events and Messages

Events

Lightweight notification of a state change

Publisher does not know (or care) **how the message is handled**

Follows a publisher/subscriber model

Messages

Application data from a source system to be consumed elsewhere

There is an expectation that a message will be handled by a receiver

Can follow either a publisher/subscriber or a producer/consumer model

Event Types

Discrete Events
Report state change from a system and enable subscribers to take action

Series Events
Report a condition and enable subscribers to analyze a condition over time

Selecting an Event-based Service

1. **Does your solution have an expectation of how data is handled or does it contain app data?** If so, select a Messaging service.

2. **Do you need a solution to send events to mobile devices as push notifications? Select Azure Notification Hub.**

3. **Does your solution produce discrete events, that report state changes that a system can act on? Select Azure Event Grid.**

4. **Does your solution report state over time for analysis by another system, such as in a data pipeline? Select Azure Event Hub.**

Review Message-based App Development

Areas of Focus

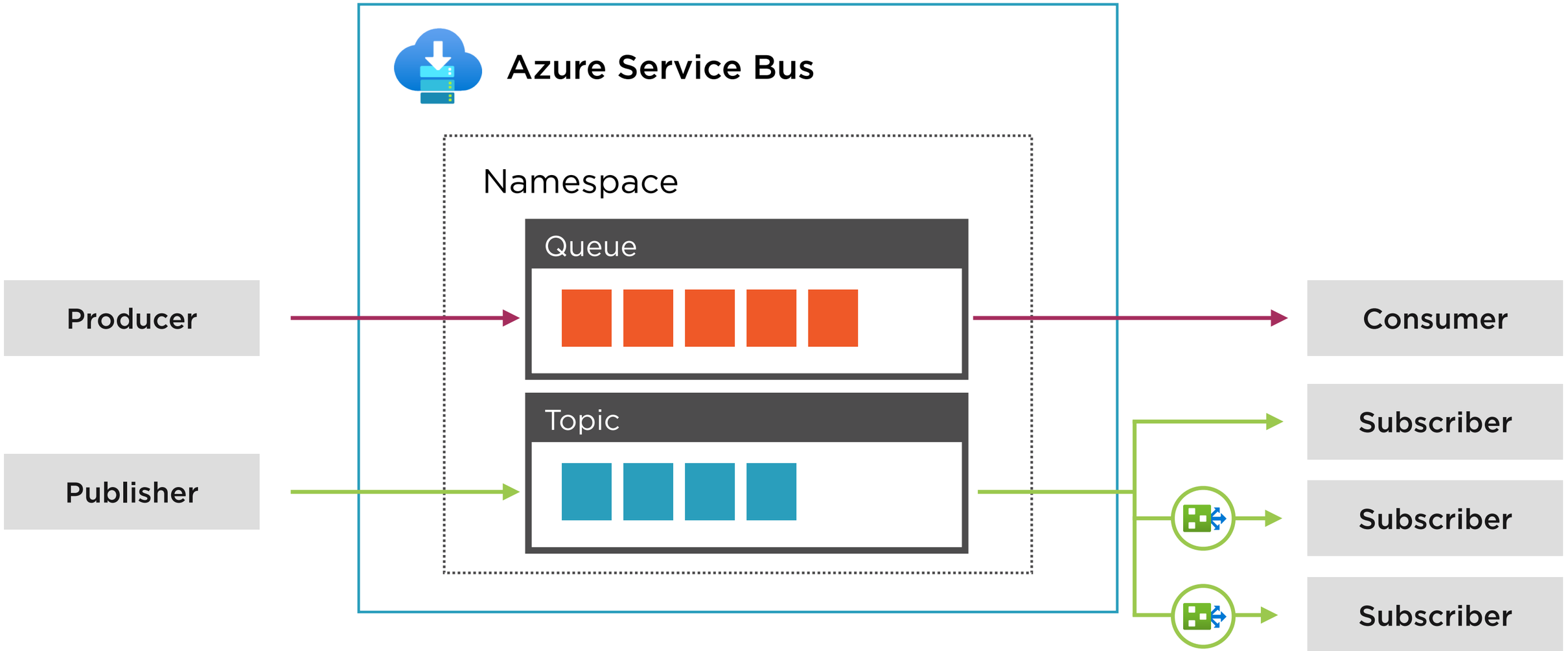
Services Overview

Interacting with Services using the CLI

Selecting a Messaging Service

Sample Queue Storage Architecture

Organization of Azure Service Bus



Azure Service Bus Topic Filters

Topic filters can be specified as:

- Boolean filters: specifies that all or none of the messages are selected
- SQL filters: a SQL-like expression to evaluate against message properties
- Correlation filters: matched against properties in the message

```
# create a queue
az storage queue create --name mysamplequeue

# delete a queue
az storage queue delete --name mysamplequeue

# view messages in a queue (without affecting visibility)
az storage message peek --queue-name mysamplequeue

# delete all messages in a queue
az storage message clear --queue-name mysamplequeue
```

Interacting with Queue Storage using the CLI

Azure CLI

```
# create a topic
az servicebus topic create --namespace-name pluralsight
--name testtopic --resource-group pluralsight

# delete a topic
az servicebus topic delete --namespace-name pluralsight
--name testtopic

# create a subscription
az servicebus topic subscription create --namespace-name pluralsight
--name testsub --topic-name testtopic
```

Interacting with Service Bus Topics using the CLI

Azure CLI

Azure Queue Storage Use Cases

Total storage for queue needs to be over 80 GB

Logs needed for all transactions executed against queue

Need to track progress of message processing

Azure Service Bus Use Cases

Need support for receiving messages without polling (with AMQP 1.0)

There is a need to guarantee message processing order (FIFO)

There is a need to detect duplicate messages

You need to support messages up to 256 KB

You may need to support topic based notifications (one to many)

You need to support publishing and consuming in batches

Example Scenarios

Scenario 1

Sylvia is implementing an API on API Management with the Standard tier

She is configuring the built-in cache so calls are cached per unique user

Unique users are identified based on a JWT token in the Authorization header

How should she configure the caching?

API Management Policy

```
<policies>
    <  1  >
        <base />
        <cache-lookup vary-by-developer="false"
          vary-by-developer-groups="false" caching-type="  3  ">
            <vary-by-header>  4  </vary-by-header>
        </cache-lookup>
    </  1  >

    <  2  >
        <cache-store duration="300" />
        <base />
    </  2  >
</policies>
```

Scenario 2

Edward's company is creating a new SaaS application on Azure

He wants to create Logic Apps to handle key customer events like signup

He wants to edit his workflows directly in the JSON templates

He also wants to connect these apps to their custom CRM

What approach would he take to build this solution?

Scenario 3

Cindy is developing an architecture for an order processing application

She is creating the application in a modular manner

She is planning the leverage Azure Functions to process the orders

She will be using Azure Event Grid to handle the orders as discrete events

Does Cindy's architecture fit the use case?

Scenario 4

William's company manufactures key components of oil refineries

Orders are received via EDI for most of their customers

He wants the ability to visually configure the workflow once an order is received

What approach would enable William to accomplish this on Azure?

Scenario 5

Oscar's is creating a new single-page application using React

He needs to validate users for the application's API

He wants to use Azure AD with OAuth 2 authorization

He also needs to verify that the JWT is a token for his specific application

How should Oscar configure the policy in API Management?

API Management Policy

```
<policies>
    <inbound>
        < 1 header-name="Authorization"
          failed-validation-error-message="Unauthorized">
         < 2 url="https://login.microsoftonline.com/{aad-
     tenant}/.well-known/openid-configuration" />
            < 3 >
                <claim name="aud">
                    <value>{Application ID of backend-app}</value>
                </claim>
            </ 3 >

        </ 1 >
    </inbound>
    …
</policies>
```

Scenario 6

James's company has created a fantasy football platform

On draft day, all player acquisitions are handled in a queue

All acquisitions must be handled in order

Given the volume, it is estimated that the queue could grow to 10 GB

What service should James leverage for processing these acquisitions?

Scenario Answers

Scenario 1

Sylvia is implementing an API on API Management with the Standard tier

She is configuring the built-in cache so calls are cached per unique user

Unique users are identified based on a JWT token in the Authorization header

How should she configure the caching?

API Management Policy

```
<policies>
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        <base />
        <cache-lookup vary-by-developer="false"
          vary-by-developer-groups="false" caching-type="  internal  ">
            <vary-by-header>  Authorization  </vary-by-header>
        </cache-lookup>
    </  inbound  >

    <  outbound  >
        <cache-store duration="300" />
        <base />
    </  outbound  >
</policies>
```

Scenario 2

Edward's company is creating a new SaaS application on Azure

He wants to create Logic Apps to handle key customer events like signup

He wants to edit his workflows directly in the JSON templates

He also wants to connect these apps to their custom CRM

What approach would he take to build this solution?

Solution: Utilize the IDE or Code Editor authoring experience and create a custom connector for the CRM

Scenario 3

Cindy is developing an architecture for an order processing application

She is creating the application in a modular manner

She is planning the leverage Azure Functions to process the orders

She will be using Azure Event Grid to handle the orders as discrete events

Does Cindy's architecture fit the use case?

Solution: No. She is using an event service for a message-based use case.

Scenario 4

William's company manufactures key components of oil refineries

Orders are received via EDI for most of their customers

He wants the ability to visually configure the workflow once an order is received

What approach would enable William to accomplish this on Azure?

Solution: Utilize the Visual Designer for an App Service Logic App with the Enterprise Integration Pack

Scenario 5

Oscar's is creating a new single-page application using React

He needs to validate users for the application's API

He wants to use Azure AD with OAuth 2 authorization

He also needs to verify that the JWT is a token for his specific application

How should Oscar configure the policy in API Management?

API Management Policy

```
<policies>
    <inbound>
        < validate-jwt header-name="Authorization"
          failed-validation-error-message="Unauthorized">
         < openid-config url="https://login.microsoftonline.com/{aad-
     tenant}/.well-known/openid-configuration" />
            <  required-claims  >
                <claim name="aud">
                    <value>{Application ID of backend-app}</value>
                </claim>
            </ required-claims  >

        </ validate-jwt  >
    </inbound>
    …
</policies>
```

Scenario 6

James's company has created a fantasy football platform

On draft day, all player acquisitions are handled in a queue

All acquisitions must be handled in order

Given the volume, it is estimated that the queue could grow to 10 GB

What service should James leverage for processing these acquisitions?

Solution: Azure Service Bus