AZ-204

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Develop Azure compute solutions

Testlet 1

Case study

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Current environment

Windows Server 2016 virtual machine

This virtual machine (VM) runs BizTalk Server 2016. The VM runs the following workflows:

▪ Ocean Transport – This workflow gathers and validates container information including container contents and arrival notices at various shipping ports. ▪ Inland Transport – This workflow gathers and validates trucking information including fuel usage, number of stops, and routes.

The VM supports the following REST API calls:

▪ Container API – This API provides container information including weight, contents, and other attributes.
▪ Location API – This API provides location information regarding shipping ports of call and trucking stops.
▪ Shipping REST API – This API provides shipping information for use and display on the shipping website.
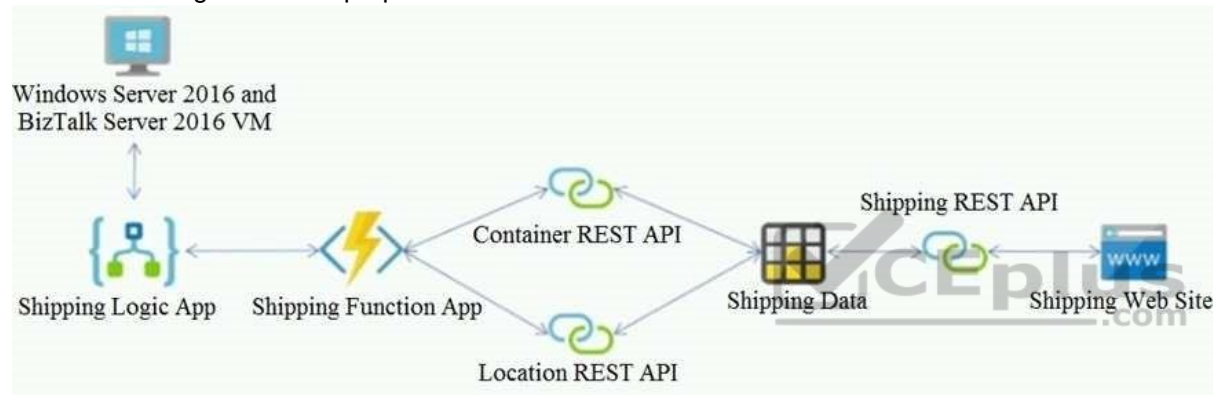
Shipping Data

The application uses MongoDB JSON document storage database for all container and transport information.

Shipping Web Site

The site displays shipping container tracking information and container contents. The site is located at http://shipping.wideworldimporters.com/

Proposed solution

The on-premises shipping application must be moved to Azure. The VM has been migrated to a new Standard_D16s_v3 Azure VM by using Azure Site Recovery and must remain running in Azure to complete the BizTalk component migrations. You create a Standard_D16s_v3 Azure VM to host BizTalk Server. The Azure architecture diagram for the proposed solution is shown below:

Requirements

Shipping Logic app

The Shipping Logic app must meet the following requirements:

▪ Support the ocean transport and inland transport workflows by using a Logic App.
▪ Support industry-standard protocol X12 message format for various messages including vessel content details and arrival notices.
▪ Secure resources to the corporate VNet and use dedicated storage resources with a fixed costing model. ▪
Maintain on-premises connectivity to support legacy applications and final BizTalk migrations.

Shipping Function app

Implement secure function endpoints by using app-level security and include Azure Active Directory (Azure AD).

REST APIs

The REST API's that support the solution must meet the following requirements:

▪ Secure resources to the corporate VNet.
▪ Allow deployment to a testing location within Azure while not incurring additional costs.
▪ Automatically scale to double capacity during peak shipping times while not causing application downtime. ▪
Minimize costs when selecting an Azure payment model.

Shipping data

Data migration from on-premises to Azure must minimize costs and downtime.

Shipping website

Use Azure Content Delivery Network (CDN) and ensure maximum performance for dynamic content while minimizing latency and costs.

Issues

Windows Server 2016 VM

The VM shows high network latency, jitter, and high CPU utilization. The VM is critical and has not been backed up in the past. The VM must enable a quick restore from a 7-day snapshot to include in-place restore of disks in case of failure.

Shipping website and REST APIs

The following error message displays while you are testing the website:

```
Failed to load http://test-shippingapi.wideworldimporters.com/: No 'Access-Control-Allow-Origin' header is present on
the requested resource. Origin 'http://test.wideworldimporters.com/' is therefore not allowed access.
```

Develop Azure compute solutions

Question Set 2

QUESTION 1
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You develop a software as a service (SaaS) offering to manage photographs. Users upload photos to a web service which then stores the photos in Azure Storage Blob storage. The storage account type is General-purpose V2.

When photos are uploaded, they must be processed to produce and save a mobile-friendly version of the image. The process to produce a mobile-friendly version of the image must start in less than one minute.

You need to design the process that starts the photo processing.

Solution: Move photo processing to an Azure Function triggered from the blob upload.

https://vceplus.com/ Does the

solution meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Azure Storage events allow applications to react to events. Common Blob storage event scenarios include image or video processing, search indexing, or any fileoriented workflow.

Events are pushed using Azure Event Grid to subscribers such as Azure Functions, Azure Logic Apps, or even to your own http listener.

Note: Only storage accounts of kind StorageV2 (general purpose v2) and BlobStorage support event integration. Storage (general purpose v1) does not support integration with Event Grid.

Reference: https://docs.microsoft.com/en-us/azure/storage/blobs/storage-blob-event-overview

QUESTION 2
You are developing an application that uses Azure Blob storage.

The application must read the transaction logs of all the changes that occur to the blobs and the blob metadata in the storage account for auditing purposes. The changes must be in the order in which they occurred, include only create, update, delete, and copy operations and be retained for compliance reasons.

You need to process the transaction logs asynchronously.

What should you do?

A. Process all Azure Blob storage events by using Azure Event Grid with a subscriber Azure Function app.
B. Enable the change feed on the storage account and process all changes for available events.
C. Process all Azure Storage Analytics logs for successful blob events.
D. Use the Azure Monitor HTTP Data Collector API and scan the request body for successful blob events.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Change feed support in Azure Blob Storage
The purpose of the change feed is to provide transaction logs of all the changes that occur to the blobs and the blob metadata in your storage account. The change feed provides ordered, guaranteed, durable, immutable, read-only log of these changes. Client applications can read these logs at any time, either in streaming or in batch mode. The change feed enables you to build efficient and scalable solutions that process change events that occur in your Blob Storage account at a low cost.

Reference: https://docs.microsoft.com/en-us/azure/storage/blobs/storage-blob-change-feed

QUESTION 3
You are developing a web app that is protected by Azure Web Application Firewall (WAF). All traffic to the web app is routed through an Azure Application Gateway instance that is used by multiple web apps. The web app address is contoso.azurewebsites.net.

All traffic must be secured with SSL. The Azure Application Gateway instance is used by multiple web apps.

You need to configure the Azure Application Gateway for the web app.

Which two actions should you perform? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

A. In the Azure Application Gateway's HTTP setting, enable the **Use for App service** setting.
B. Convert the web app to run in an Azure App service environment (ASE).
C. Add an authentication certificate for contoso.azurewebsites.net to the Azure Application Gateway.
D. In the Azure Application Gateway's HTTP setting, set the value of the Override backend path option to **contoso22.azurewebsites.net**.

Correct Answer: AD
Section: (none)
Explanation

Explanation/Reference:
Explanation:
D: The ability to specify a host override is defined in the HTTP settings and can be applied to any back-end pool during rule creation.
The ability to derive the host name from the IP or FQDN of the back-end pool members. HTTP settings also provide an option to dynamically pick the host name from a back-end pool member's FQDN if configured with the option to derive host name from an individual back-end pool member.

A (not C): SSL termination and end to end SSL with multi-tenant services.
In case of end to end SSL, trusted Azure services such as Azure App service web apps do not require whitelisting the backends in the application gateway.
Therefore, there is no need to add any authentication certificates.

Add HTTP setting

saiappgw-appgw

* Protocol

| HTTP | HTTPS |

ℹ️ Authentication certificates are not required for trusted Azure certificates for end to end ssl to work

* Port ℹ️

443 ✓

* Request timeout (seconds)

20

Override backend path ℹ️

☑ Use for App service

☑ Use custom probe ℹ️

OK

QUESTION 4
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When photos are uploaded, they must be processed to produce and save a mobile-friendly version of the image. The process to produce a mobile-friendly version of the image must start in less than one minute.

You need to design the process that starts the photo processing.

Solution: Trigger the photo processing from Blob storage events.

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
You need to catch the triggered event, so move the photo processing to an Azure Function triggered from the blob upload

Note: Azure Storage events allow applications to react to events. Common Blob storage event scenarios include image or video processing, search indexing, or any file-oriented workflow.

Events are pushed using Azure Event Grid to subscribers such as Azure Functions, Azure Logic Apps, or even to your own http listener.

Note: Only storage accounts of kind StorageV2 (general purpose v2) and BlobStorage support event integration. Storage (general purpose v1) does not support integration with Event Grid.

Reference: https://docs.microsoft.com/en-us/azure/storage/blobs/storage-blob-event-overview

QUESTION 5
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You develop and deploy an Azure App Service API app to a Windows-hosted deployment slot named Development. You create additional deployment slots named **Testing** and **Production**. You enable auto swap on the Production deployment slot.

You need to ensure that scripts run and resources are available before a swap operation occurs.

Solution: Update the web.config file to include the applicationInitialization configuration element. Specify custom initialization actions to run the scripts.

Does the solution meet the goal?

A. No
B. Yes

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Specify custom warm-up.
Some apps might require custom warm-up actions before the swap. The applicationInitialization configuration element in web.config lets you specify custom initialization actions. The swap operation waits for this custom warm-up to finish before swapping with the target slot. Here's a sample web.config fragment.

<system.webServer>
   <applicationInitialization>
      <add initializationPage="/" hostName="[app hostname]" />
      <add initializationPage="/Home/About" hostName="[app hostname]"
/>   </applicationInitialization> </system.webServer>

Reference: https://docs.microsoft.com/en-us/azure/app-service/deploy-staging-slots#troubleshoot-swaps

QUESTION 6
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You need to ensure that scripts run and resources are available before a swap operation occurs.

Solution: Enable auto swap for the Testing slot. Deploy the app to the Testing slot.

Does the solution meet the goal?

A. No
B. Yes

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead update the web.config file to include the applicationInitialization configuration element. Specify custom initialization actions to run the scripts.

Note: Some apps might require custom warm-up actions before the swap. The applicationInitialization configuration element in web.config lets you specify custom initialization actions. The swap operation waits for this custom warm-up to finish before swapping with the target slot. Here's a sample web.config fragment.

```
<system.webServer>
   <applicationInitialization>
      <add initializationPage="/" hostName="[app hostname]" />
      <add initializationPage="/Home/About" hostName="[app hostname]" />
   </applicationInitialization>
</system.webServer>
```

Reference: https://docs.microsoft.com/en-us/azure/app-service/deploy-staging-slots#troubleshoot-swaps

QUESTION 7
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You develop and deploy an Azure App Service API app to a Windows-hosted deployment slot named Development. You create additional deployment slots named **Testing** and **Production**. You enable auto swap on the Production deployment slot.

You need to ensure that scripts run and resources are available before a swap operation occurs.

Solution: Disable auto swap. Update the app with a method named statuscheck to run the scripts. Re-enable auto swap and deploy the app to the Production slot.

Does the solution meet the goal?

A. No
B. Yes

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead update the web.config file to include the applicationInitialization configuration element. Specify custom initialization actions to run the scripts.

Note: Some apps might require custom warm-up actions before the swap. The applicationInitialization configuration element in web.config lets you specify custom initialization actions. The swap operation waits for this custom warm-up to finish before swapping with the target slot. Here's a sample web.config fragment.

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</system.webServer>
```

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When photos are uploaded, they must be processed to produce and save a mobile-friendly version of the image. The process to produce a mobile-friendly version of the image must start in less than one minute.

You need to design the process that starts the photo processing.

Solution: Convert the Azure Storage account to a BlockBlobStorage storage account.

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Not necessary to convert the account, instead move photo processing to an Azure Function triggered from the blob upload..

Azure Storage events allow applications to react to events. Common Blob storage event scenarios include image or video processing, search indexing, or any fileoriented workflow.

Note: Only storage accounts of kind StorageV2 (general purpose v2) and BlobStorage support event integration. Storage (general purpose v1) does not support integration with Event Grid.

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Develop for Azure storage

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Background

Overview

You are a developer for Contoso, Ltd. The company has a social networking website that is developed as a Single Page Application (SPA). The main web application for the social networking website loads user uploaded content from blob storage.

You are developing a solution to monitor uploaded data for inappropriate content. The following process occurs when users upload content by using the SPA:

• Messages are sent to ContentUploadService.
• Content is processed by ContentAnalysisService.
• After processing is complete, the content is posted to the social network or a rejection message is posted in its place.

The ContentAnalysisService is deployed with Azure Container Instances from a private Azure Container Registry named contosoimages.

The solution will use eight CPU cores.

Azure Active Directory

Contoso, Ltd. uses Azure Active Directory (Azure AD) for both internal and guest accounts.

Requirements

ContentAnalysisService

The company's data science group built ContentAnalysisService which accepts user generated content as a string and returns a probable value for inappropriate content. Any values over a specific threshold must be reviewed by an employee of Contoso, Ltd.

You must create an Azure Function named CheckUserContent to perform the content checks.

Costs

You must minimize costs for all Azure services.

Manual review

To review content, the user must authenticate to the website portion of the ContentAnalysisService using their Azure AD credentials. The website is built using React and all pages and API endpoints require authentication. In order to review content a user must be part of a ContentReviewer role. All completed reviews must include the reviewer's email address for auditing purposes. **High availability**

All services must run in multiple regions. The failure of any service in a region must not impact overall application availability.

Monitoring

An alert must be raised if the ContentUploadService uses more than 80 percent of available CPU cores.

Security

You have the following security requirements:
▪ Any web service accessible over the Internet must be protected from cross site scripting attacks.
▪ All websites and services must use SSL from a valid root certificate authority.
▪ Azure Storage access keys must only be stored in memory and must be available only to the service.
▪ All Internal services must only be accessible from internal Virtual Networks (VNets).
▪ All parts of the system must support inbound and outbound traffic restrictions. ▪
All service calls must be authenticated by using Azure AD.

User agreements

When a user submits content, they must agree to a user agreement. The agreement allows employees of Contoso, Ltd. to review content, store cookies on user devices, and track user's IP addresses.

Information regarding agreements is used by multiple divisions within Contoso, Ltd.

User responses must not be lost and must be available to all parties regardless of individual service uptime. The volume of agreements is expected to be in the millions per hour.

Validation testing

When a new version of the ContentAnalysisService is available the previous seven days of content must be processed with the new version to verify that the new version does not significantly deviate from the old version.

Issues

Users of the ContentUploadService report that they occasionally see HTTP 502 responses on specific pages.

Code

ContentUploadService

```
CS01 apiVersion: '2018-10-01'
CS02 type: Microsoft.ContainerInstance/containerGroups
CS03 location: westus
CS04 name: contentUploadService
CS05 properties:
CS06     containers:
CS07     - name: service
CS08         properties:
CS09         image: contoso/contentUploadService:latest
CS10         ports:
CS11         - port: 80
CS12           protocol: TCP
CS13         resources:
CS14           requests:
CS15             cpu: 1.0
CS16             memoryInGB: 1.5
CS17
CS18 ipAddress:
CS19     ip: 10.23.121.112
CS20     ports:
CS21     - port: 80
CS22       protocol: TCP
CS23
CS24
CS25 networkProfile:
CS26
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet
```

```
AM01 {
AM02        "id" : "2b079f03-9b06-2d44-98bb-e9182901fcb6",
AM03        "appId" : "7118a7f0-b5c2-4c9d-833c-3d711396fe65",
AM04
AM05        "createdDateTime" : "2019-12-24T06:01:44Z",
AM06        "logoUrl" : null,
AM07        "logoutUrl" : null,
AM08        "name" : "ContentAnalysisService",
AM09
AM10
AM11        "orgRestrictions" : [],
AM12        "parentalControlSettings" : {
AM13         "countriesBlockedForMinors" : [],
AM14          "legalAgeGroupRule" : "Allow"
AM15        },
AM16        "passwordCredentials" : []
AM17 }
```

QUESTION 1
You need to configure the ContentUploadService deployment.

Which two actions should you perform? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

A. Add the following markup to line CS23:`type:`
   `Private`

B. Add the following markup to line CS24:
   `osType: Windows`

C. Add the following markup to line CS24:
   `osType: Linux`

D. Add the following markup to line CS23: `type:`
   `Public`

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Scenario: All Internal services must only be accessible from Internal Virtual Networks (VNets)

There are three Network Location types – Private, Public and Domain

Reference: https://devblogs.microsoft.com/powershell/setting-network-location-to-private/

QUESTION 2
You need to store the user agreements.

Where should you store the agreement after it is completed?

A. Azure Storage queue
B. Azure Event Hub
C. Azure Service Bus topic
D. Azure Event Grid topic

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Azure Event Hub is used for telemetry and distributed data streaming.

This service provides a single solution that enables rapid data retrieval for real-time processing as well as repeated replay of stored raw data. It can capture the streaming data into a file for processing and analysis.

It has the following characteristics:
low latency

capable of receiving and processing millions of events per second
at least once delivery

Reference:

https://docs.microsoft.com/en-us/azure/event-grid/compare-messaging-services

Develop for Azure storage

Question Set 2

QUESTION 1
You develop Azure solutions.

You must connect to a No-SQL globally-distributed database by using the .NET API.

You need to create an object to configure and execute requests in the database.

Which code segment should you use?

A. new Container(EndpointUri, PrimaryKey);

B. new Database(EndpointUri, PrimaryKey);

C. new CosmosClient(EndpointUri, PrimaryKey);

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Example:
// Create a new instance of the Cosmos Client   this.cosmosClient
= new CosmosClient(EndpointUri, PrimaryKey)

//ADD THIS PART TO YOUR CODE
await this.CreateDatabaseAsync();

Reference:
https://docs.microsoft.com/en-us/azure/cosmos-db/sql-api-get-started

Implement Azure security

Testlet 1

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CS02 type: Microsoft.ContainerInstance/containerGroups
CS03 location: westus
CS04 name: contentUploadService
CS05 properties:
CS06     containers:
CS07     - name: service
CS08         properties:
CS09         image: contoso/contentUploadService:latest
CS10         ports:
CS11         - port: 80
CS12           protocol: TCP
CS13         resources:
CS14           requests:
CS15             cpu: 1.0
CS16             memoryInGB: 1.5
CS17
CS18 ipAddress:
CS19     ip: 10.23.121.112
CS20     ports:
CS21     - port: 80
CS22       protocol: TCP
CS23
CS24
CS25 networkProfile:
CS26
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet
```

```
AM01 {
AM02       "id" : "2b079f03-9b06-2d44-98bb-e9182901fcb6",
AM03       "appId" : "7118a7f0-b5c2-4c9d-833c-3d711396fe65",
AM04
AM05       "createdDateTime" : "2019-12-24T06:01:44Z",
AM06       "logoUrl" : null,
AM07       "logoutUrl" : null,
AM08       "name" : "ContentAnalysisService",
AM09
AM10
AM11       "orgRestrictions" : [],
AM12       "parentalControlSettings" : {
AM13        "countriesBlockedForMinors" : [],
AM14          "legalAgeGroupRule" : "Allow"
AM15       },
AM16       "passwordCredentials" : []
AM17 }
```

Implement Azure security

Testlet 2

Case study

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Current environment

Windows Server 2016 virtual machine

This virtual machine (VM) runs BizTalk Server 2016. The VM runs the following workflows:

▪ Ocean Transport – This workflow gathers and validates container information including container contents and arrival notices at various shipping ports. ▪ Inland Transport – This workflow gathers and validates trucking information including fuel usage, number of stops, and routes.

The VM supports the following REST API calls:

▪ Container API – This API provides container information including weight, contents, and other attributes.
▪ Location API – This API provides location information regarding shipping ports of call and trucking stops.
▪ Shipping REST API – This API provides shipping information for use and display on the shipping website.
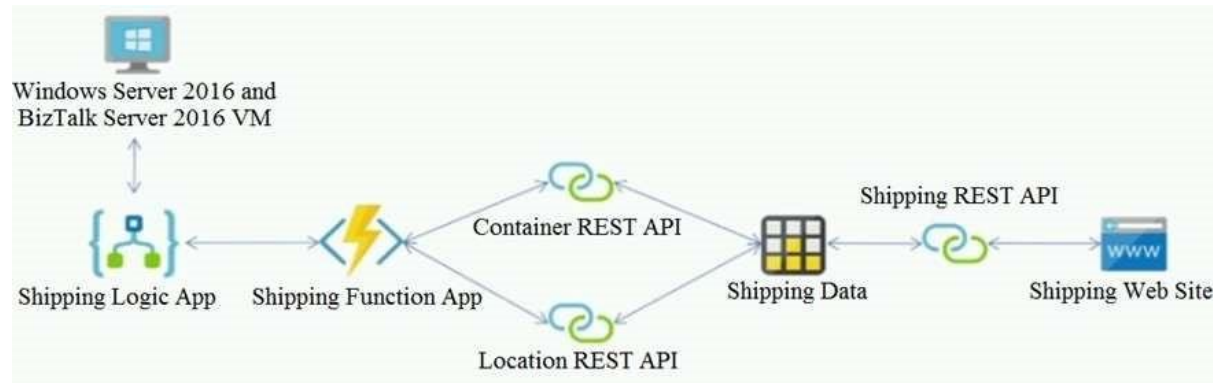
Shipping Data

The application uses MongoDB JSON document storage database for all container and transport information.

Shipping Web Site

The site displays shipping container tracking information and container contents. The site is located at http://shipping.wideworldimporters.com/

Proposed solution

The on-premises shipping application must be moved to Azure. The VM has been migrated to a new Standard_D16s_v3 Azure VM by using Azure Site Recovery and must remain running in Azure to complete the BizTalk component migrations. You create a Standard_D16s_v3 Azure VM to host BizTalk Server. The Azure architecture diagram for the proposed solution is shown below:

Requirements

Shipping Logic app

The Shipping Logic app must meet the following requirements:

▪ Support the ocean transport and inland transport workflows by using a Logic App.
▪ Support industry-standard protocol X12 message format for various messages including vessel content details and arrival notices.
▪ Secure resources to the corporate VNet and use dedicated storage resources with a fixed costing model. ▪
Maintain on-premises connectivity to support legacy applications and final BizTalk migrations.

Shipping Function app

Implement secure function endpoints by using app-level security and include Azure Active Directory (Azure AD).

REST APIs

The REST API's that support the solution must meet the following requirements:

▪ Secure resources to the corporate VNet.
▪ Allow deployment to a testing location within Azure while not incurring additional costs.
▪ Automatically scale to double capacity during peak shipping times while not causing application downtime. ▪
Minimize costs when selecting an Azure payment model.

Shipping data

Data migration from on-premises to Azure must minimize costs and downtime.

Shipping website

Use Azure Content Delivery Network (CDN) and ensure maximum performance for dynamic content while minimizing latency and costs.

Issues

Windows Server 2016 VM

The VM shows high network latency, jitter, and high CPU utilization. The VM is critical and has not been backed up in the past. The VM must enable a quick restore from a 7-day snapshot to include in-place restore of disks in case of failure.

Shipping website and REST APIs

The following error message displays while you are testing the website:

```
Failed to load http://test-shippingapi.wideworldimporters.com/: No 'Access-Control-Allow-Origin' header is present on
the requested resource. Origin 'http://test.wideworldimporters.com/' is therefore not allowed access.
```

QUESTION 1
You need to secure the Shipping Logic App.

What should you use?

A. Azure App Service Environment (ASE)
B. Integration Service Environment (ISE)
C. VNet service endpoint
D. Azure AD B2B integration

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Scenario: The Shipping Logic App requires secure resources to the corporate VNet and use dedicated storage resources with a fixed costing model.

You can access to Azure Virtual Network resources from Azure Logic Apps by using integration service environments (ISEs).

Sometimes, your logic apps and integration accounts need access to secured resources, such as virtual machines (VMs) and other systems or services, that are inside an Azure virtual network. To set up this access, you can create an integration service environment (ISE) where you can run your logic apps and create your integration accounts.

Reference:
https://docs.microsoft.com/en-us/azure/logic-apps/connect-virtual-network-vnet-isolated-environment-overview

Implement Azure security

Question Set 3

QUESTION 1
Your company is developing an Azure API.

You need to implement authentication for the Azure API. You have the following requirements:

▪ All API calls must be secure.
▪ Callers to the API must not send credentials to the API.

Which authentication mechanism should you use?

A. Basic
B. Anonymous
C. Managed identity
D. Client certificate

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Use the authentication-managed-identity policy to authenticate with a backend service using the managed identity of the API Management service. This policy essentially uses the managed identity to obtain an access token from Azure Active Directory for accessing the specified resource. After successfully obtaining the token, the policy will set the value of the token in the Authorization header using the Bearer scheme.

Reference: https://docs.microsoft.com/bs-cyrl-ba/azure/api-management/api-management-authentication-policies

QUESTION 2
You are a developer for a SaaS company that offers many web services.

All web services for the company must meet the following requirements:

▪ Use API Management to access the services
▪ Use OpenID Connect for authentication
▪ Prevent anonymous usage

A recent security audit found that several web services can be called without any authentication.

Which API Management policy should you implement?

A. jsonp
B. authentication-certificate
C. check-headerD. validate-jwt

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Add the validate-jwt policy to validate the OAuth token for every incoming request.

Incorrect Answers:
A: The jsonp policy adds JSON with padding (JSONP) support to an operation or an API to allow cross-domain calls from JavaScript browser-based clients. JSONP is a method used in JavaScript programs to request data from a server in a different domain. JSONP bypasses the limitation enforced by most web browsers where access to web pages must be in the same domain.

JSONP - Adds JSON with padding (JSONP) support to an operation or an API to allow cross-domain calls from JavaScript browser-based clients.

Reference: https://docs.microsoft.com/en-us/azure/api-management/api-management-howto-protect-backend-with-aad

QUESTION 3

You have a new Azure subscription. You are developing an internal website for employees to view sensitive data. The website uses Azure Active Directory (Azure AD) for authentication.

You need to implement multifactor authentication for the website.

Which two actions should you perform? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

A. Configure the website to use Azure AD B2C.
B. In Azure AD, create a new conditional access policy.
C. Upgrade to Azure AD Premium.
D. In Azure AD, enable application proxy.
E. In Azure AD conditional access, enable the baseline policy.

Correct Answer: BC
Section: (none)
Explanation

Explanation/Reference:
Explanation:
B: MFA Enabled by conditional access policy. It is the most flexible means to enable two-step verification for your users. Enabling using conditional access policy only works for Azure MFA in the cloud and is a premium feature of Azure AD.

C: Multi-Factor Authentication comes as part of the following offerings:
▪ Azure Active Directory Premium licenses - Full featured use of Azure Multi-Factor Authentication Service (Cloud) or Azure Multi-Factor Authentication Server (On-premises).
▪ Multi-Factor Authentication for Office 365
▪ Azure Active Directory Global Administrators

Reference: https://docs.microsoft.com/en-us/azure/active-directory/authentication/howto-mfa-getstarted

QUESTION 4
Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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You develop Azure solutions.

You must grant a virtual machine (VM) access to specific resource groups in Azure Resource Manager.

You need to obtain an Azure Resource Manager access token.

Solution: Use an X.509 certificate to authenticate the VM with Azure Resource Manager.

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead run the Invoke-RestMethod cmdlet to make a request to the local managed identity for Azure resources endpoint.

Reference: https://docs.microsoft.com/en-us/azure/active-directory/managed-identities-azure-resources/tutorial-windows-vm-access-arm

QUESTION 5
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You develop Azure solutions.

You must grant a virtual machine (VM) access to specific resource groups in Azure Resource Manager.

You need to obtain an Azure Resource Manager access token.

Solution: Use the Reader role-based access control (RBAC) role to authenticate the VM with Azure Resource Manager.

Does the solution meet the goal?

A. Yes

B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:

Instead run the Invoke-RestMethod cmdlet to make a request to the local managed identity for Azure resources endpoint.

Reference: https://docs.microsoft.com/en-us/azure/active-directory/managed-identities-azure-resources/tutorial-windows-vm-access-arm

QUESTION 6
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You develop Azure solutions.

You must grant a virtual machine (VM) access to specific resource groups in Azure Resource Manager.

You need to obtain an Azure Resource Manager access token.

Solution: Run the Invoke-RestMethod cmdlet to make a request to the local managed identity for Azure resources endpoint.

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:

Get an access token using the VM's system-assigned managed identity and use it to call Azure Resource Manager
You will need to use PowerShell in this portion.

1. In the portal, navigate to Virtual Machines and go to your Windows virtual machine and in the Overview, click Connect.
2. Enter in your Username and Password for which you added when you created the Windows VM.
3. Now that you have created a Remote Desktop Connection with the virtual machine, open PowerShell in the remote session.
4. Using the Invoke-WebRequest cmdlet, make a request to the local managed identity for Azure resources endpoint to get an access token for Azure Resource Manager.

Example:
  $response = Invoke-WebRequest -Uri 'http://169.254.169.254/metadata/identity/oauth2/token?api-version=2018-02-01&resource=https://management.azure.com/' -Method GET -Headers @{Metadata="true"}

Reference: https://docs.microsoft.com/en-us/azure/active-directory/managed-identities-azure-resources/tutorial-windows-vm-access-arm

Monitor, troubleshoot, and optimize Azure solutions

Testlet 1

Case study

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Background

Overview

You are a developer for Contoso, Ltd. The company has a social networking website that is developed as a Single Page Application (SPA). The main web application for the social networking website loads user uploaded content from blob storage.

You are developing a solution to monitor uploaded data for inappropriate content. The following process occurs when users upload content by using the SPA:

• Messages are sent to ContentUploadService.
• Content is processed by ContentAnalysisService.
• After processing is complete, the content is posted to the social network or a rejection message is posted in its place.

The ContentAnalysisService is deployed with Azure Container Instances from a private Azure Container Registry named contosoimages.

The solution will use eight CPU cores.

Azure Active Directory

Contoso, Ltd. uses Azure Active Directory (Azure AD) for both internal and guest accounts.

Requirements

ContentAnalysisService

The company's data science group built ContentAnalysisService which accepts user generated content as a string and returns a probable value for inappropriate content. Any values over a specific threshold must be reviewed by an employee of Contoso, Ltd.

You must create an Azure Function named CheckUserContent to perform the content checks.

Costs

You must minimize costs for all Azure services.

Manual review

To review content, the user must authenticate to the website portion of the ContentAnalysisService using their Azure AD credentials. The website is built using React and all pages and API endpoints require authentication. In order to review content a user must be part of a ContentReviewer role. All completed reviews must include the reviewer's email address for auditing purposes. **High availability**

All services must run in multiple regions. The failure of any service in a region must not impact overall application availability.

Monitoring

An alert must be raised if the ContentUploadService uses more than 80 percent of available CPU cores.

Security

You have the following security requirements:
▪ Any web service accessible over the Internet must be protected from cross site scripting attacks.
▪ All websites and services must use SSL from a valid root certificate authority.
▪ Azure Storage access keys must only be stored in memory and must be available only to the service.
▪ All Internal services must only be accessible from internal Virtual Networks (VNets).
▪ All parts of the system must support inbound and outbound traffic restrictions. ▪
All service calls must be authenticated by using Azure AD.

User agreements

When a user submits content, they must agree to a user agreement. The agreement allows employees of Contoso, Ltd. to review content, store cookies on user devices, and track user's IP addresses.

Information regarding agreements is used by multiple divisions within Contoso, Ltd.

User responses must not be lost and must be available to all parties regardless of individual service uptime. The volume of agreements is expected to be in the millions per hour.

Validation testing

When a new version of the ContentAnalysisService is available the previous seven days of content must be processed with the new version to verify that the new version does not significantly deviate from the old version.

Issues

Users of the ContentUploadService report that they occasionally see HTTP 502 responses on specific pages.

Code

ContentUploadService

```
CS01 apiVersion: '2018-10-01'
CS02 type: Microsoft.ContainerInstance/containerGroups
CS03 location: westus
CS04 name: contentUploadService
CS05 properties:
CS06     containers:
CS07     - name: service
CS08         properties:
CS09         image: contoso/contentUploadService:latest
CS10         ports:
CS11         - port: 80
CS12           protocol: TCP
CS13         resources:
CS14           requests:
CS15             cpu: 1.0
CS16             memoryInGB: 1.5
CS17
CS18 ipAddress:
CS19     ip: 10.23.121.112
CS20     ports:
CS21     - port: 80
CS22       protocol: TCP
CS23
CS24
CS25 networkProfile:
CS26
id: /subscriptions/98...19/resourceGroups/container/providers/Microsoft.Network/networkProfiles/subnet
```

```
AM01 {
AM02        "id" : "2b079f03-9b06-2d44-98bb-e9182901fcb6",
AM03        "appId" : "7118a7f0-b5c2-4c9d-833c-3d711396fe65",
AM04
AM05        "createdDateTime" : "2019-12-24T06:01:44Z",
AM06        "logoUrl" : null,
AM07        "logoutUrl" : null,
AM08        "name" : "ContentAnalysisService",
AM09
AM10
AM11        "orgRestrictions" : [],
AM12        "parentalControlSettings" : {
AM13         "countriesBlockedForMinors" : [],
AM14          "legalAgeGroupRule" : "Allow"
AM15        },
AM16        "passwordCredentials" : []
AM17 }
```

QUESTION 1
You need to monitor ContentUploadService according to the requirements.

Which command should you use?

A. `az monitor metrics alert create -n alert -g … - -scopes … - -condition "avg Percentage CPU > 8"`

B. `az monitor metrics alert create -n alert -g … - -scopes … - -condition "avg Percentage CPU > 800"`

C. `az monitor metrics alert create -n alert -g … - -scopes … - -condition "CPU Usage > 800"`

D. `az monitor metrics alert create -n alert -g … - -scopes … - -condition "CPU Usage > 8"`

Correct Answer: B
Section: (none)

Explanation

Explanation/Reference:
Explanation:
Scenario: An alert must be raised if the ContentUploadService uses more than 80 percent of available CPU cores

Reference:
https://docs.microsoft.com/sv-se/cli/azure/monitor/metrics/alert

Monitor, troubleshoot, and optimize Azure solutions

Question Set 2

QUESTION 1
You are developing an ASP.NET Core Web API web service. The web service uses Azure Application Insights for all telemetry and dependency tracking. The web service reads and writes data to a database other than Microsoft SQL Server.

You need to ensure that dependency tracking works for calls to the third-party database.

Which two dependency telemetry properties should you use? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

A. Telemetry.Context.Cloud.RoleInstance
B. Telemetry.Id
C. Telemetry.Name
D. Telemetry.Context.Operation.Id
E. Telemetry.Context.Session.Id

Correct Answer: BD
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Example:
public async Task Enqueue(string payload)
{
    // StartOperation is a helper method that initializes the telemetry item
// and allows correlation of this operation with its parent and children.
    var operation = telemetryClient.StartOperation<DependencyTelemetry>("enqueue " + queueName);

    operation.Telemetry.Type = "Azure Service Bus";
operation.Telemetry.Data = "Enqueue " + queueName;

    var message = new BrokeredMessage(payload);
    // Service Bus queue allows the property bag to pass along with the
message.   // We will use them to pass our correlation identifiers (and other

context) // to the consumer. message.Properties.Add("ParentId",
operation.Telemetry.Id); message.Properties.Add("RootId",
operation.Telemetry.Context.Operation.Id);

Reference: https://docs.microsoft.com/en-us/azure/azure-monitor/app/custom-operations-tracking

QUESTION 2

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution. Determine whether the solution meets the stated goals.

You are developing and deploying several ASP.NET web applications to Azure App Service. You plan to save session state information and HTML output.

You must use a storage mechanism with the following requirements:

▪ Share session state across all ASP.NET web applications.
▪ Support controlled, concurrent access to the same session state data for multiple readers and a single writer. ▪
Save full HTTP responses for concurrent requests.

You need to store the information.

Proposed Solution: Enable Application Request Routing (ARR).

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead deploy and configure Azure Cache for Redis. Update the web applications.

Reference: https://docs.microsoft.com/en-us/azure/architecture/best-practices/caching#managing-concurrency-in-a-cache

QUESTION 3

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- Share session state across all ASP.NET web applications.
- Support controlled, concurrent access to the same session state data for multiple readers and a single writer. ▪
Save full HTTP responses for concurrent requests.

You need to store the information.

Proposed Solution: Deploy and configure an Azure Database for PostgreSQL. Update the web applications.

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead deploy and configure Azure Cache for Redis. Update the web applications.

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▪ Support controlled, concurrent access to the same session state data for multiple readers and a single writer. ▪
Save full HTTP responses for concurrent requests.

You need to store the information.

Proposed Solution: Deploy and configure Azure Cache for Redis. Update the web applications.

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
The session state provider for Azure Cache for Redis enables you to share session information between different instances of an ASP.NET web application.
The same connection can be used by multiple concurrent threads.
Redis supports both read and write operations.
The output cache provider for Azure Cache for Redis enables you to save the HTTP responses generated by an ASP.NET web application.

Note: Using the Azure portal, you can also configure the eviction policy of the cache, and control access to the cache by adding users to the roles provided. These roles, which define the operations that members can perform, include Owner, Contributor, and Reader. For example, members of the Owner role have complete control over the cache (including security) and its contents, members of the Contributor role can read and write information in the cache, and members of the Reader role can only retrieve data from the cache.

Reference:
https://docs.microsoft.com/en-us/azure/architecture/best-practices/caching

Connect to and consume Azure services and third-party services

Testlet 1

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Windows Server 2016 virtual machine

This virtual machine (VM) runs BizTalk Server 2016. The VM runs the following workflows:

▪ Ocean Transport – This workflow gathers and validates container information including container contents and arrival notices at various shipping ports. ▪ Inland Transport – This workflow gathers and validates trucking information including fuel usage, number of stops, and routes.

The VM supports the following REST API calls:

▪ Container API – This API provides container information including weight, contents, and other attributes.
▪ Location API – This API provides location information regarding shipping ports of call and trucking stops.
▪ Shipping REST API – This API provides shipping information for use and display on the shipping website.
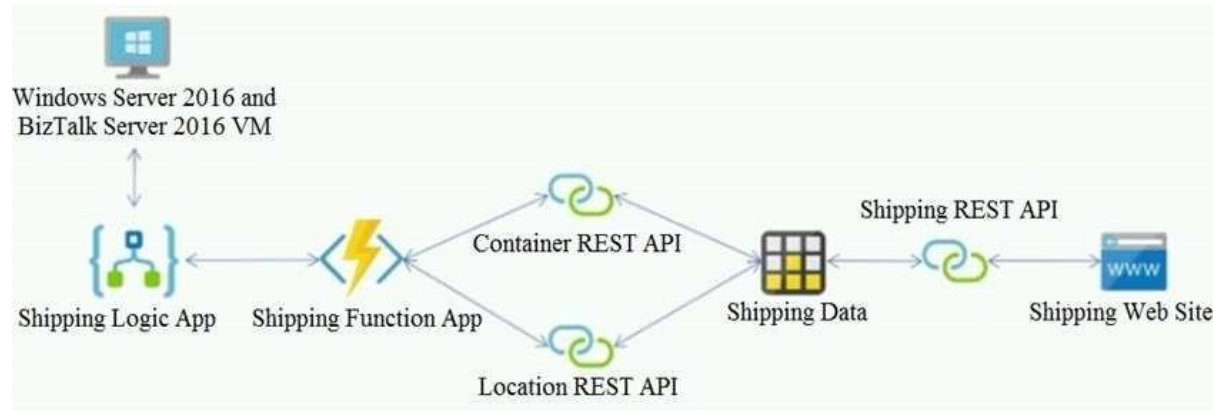
Shipping Data

The application uses MongoDB JSON document storage database for all container and transport information.

Shipping Web Site

The site displays shipping container tracking information and container contents. The site is located at http://shipping.wideworldimporters.com/

Proposed solution

The on-premises shipping application must be moved to Azure. The VM has been migrated to a new Standard_D16s_v3 Azure VM by using Azure Site Recovery and must remain running in Azure to complete the BizTalk component migrations. You create a Standard_D16s_v3 Azure VM to host BizTalk Server. The Azure architecture diagram for the proposed solution is shown below:

Requirements

Shipping Logic app

The Shipping Logic app must meet the following requirements:

▪ Support the ocean transport and inland transport workflows by using a Logic App.
▪ Support industry-standard protocol X12 message format for various messages including vessel content details and arrival notices.
▪ Secure resources to the corporate VNet and use dedicated storage resources with a fixed costing model. ▪
Maintain on-premises connectivity to support legacy applications and final BizTalk migrations.

Shipping Function app

Implement secure function endpoints by using app-level security and include Azure Active Directory (Azure AD).

REST APIs

The REST API's that support the solution must meet the following requirements:

▪ Secure resources to the corporate VNet.
▪ Allow deployment to a testing location within Azure while not incurring additional costs.
▪ Automatically scale to double capacity during peak shipping times while not causing application downtime. ▪
Minimize costs when selecting an Azure payment model.

Shipping data

Data migration from on-premises to Azure must minimize costs and downtime.

Shipping website

Use Azure Content Delivery Network (CDN) and ensure maximum performance for dynamic content while minimizing latency and costs.

Issues

Windows Server 2016 VM

The VM shows high network latency, jitter, and high CPU utilization. The VM is critical and has not been backed up in the past. The VM must enable a quick restore from a 7-day snapshot to include in-place restore of disks in case of failure.

Shipping website and REST APIs

The following error message displays while you are testing the website:

```
Failed to load http://test-shippingapi.wideworldimporters.com/: No 'Access-Control-Allow-Origin' header is present on
the requested resource. Origin 'http://test.wideworldimporters.com/' is therefore not allowed access.
```

QUESTION 1
You need to support the requirements for the Shipping Logic App.

What should you use?

A. Azure Active Directory Application Proxy
B. Site-to-Site (S2S) VPN connection
C. On-premises Data Gateway
D. Point-to-Site (P2S) VPN connection

Correct Answer: C

Section: (none)
Explanation

Explanation/Reference:
Explanation:

Before you can connect to on-premises data sources from Azure Logic Apps, download and install the on-premises data gateway on a local computer. The gateway works as a bridge that provides quick data transfer and encryption between data sources on premises (not in the cloud) and your logic apps.

The gateway supports BizTalk Server 2016.

Note: Microsoft have now fully incorporated the Azure BizTalk Services capabilities into Logic Apps and Azure App Service Hybrid Connections.

Logic Apps Enterprise Integration pack bring some of the enterprise B2B capabilities like AS2 and X12, EDI standards support

Scenario: The Shipping Logic app must meet the following requirements:
▪ Support the ocean transport and inland transport workflows by using a Logic App.
▪ Support industry-standard protocol X12 message format for various messages including vessel content details and arrival notices.
▪ Secure resources to the corporate VNet and use dedicated storage resources with a fixed costing model. ▪
Maintain on-premises connectivity to support legacy applications and final BizTalk migrations.

Reference:
https://docs.microsoft.com/en-us/azure/logic-apps/logic-apps-gateway-install

Connect to and consume Azure services and third-party services

Question Set 2

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You are developing an Azure solution to collect point-of-sale (POS) device data from 2,000 stores located throughout the world. A single device can produce 2 megabytes (MB) of data every 24 hours. Each store location has one to five devices that send data.

You must store the device data in Azure Blob storage. Device data must be correlated based on a device identifier. Additional stores are expected to open in the future.

You need to implement a solution to receive the device data.

Solution: Provision an Azure Notification Hub. Register all devices with the hub.

Does the solution meet the goal?

A. Yes

B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead use an Azure Service Bus, which is used order processing and financial transactions.

Reference: https://docs.microsoft.com/en-us/azure/event-grid/compare-messaging-services

QUESTION 2
Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You are developing an Azure solution to collect point-of-sale (POS) device data from 2,000 stores located throughout the world. A single device can produce 2 megabytes (MB) of data every 24 hours. Each store location has one to five devices that send data.

You must store the device data in Azure Blob storage. Device data must be correlated based on a device identifier. Additional stores are expected to open in the future.

You need to implement a solution to receive the device data.

Solution: Provision an Azure Service Bus. Configure a topic to receive the device data by using a correlation filter.

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:

A message is raw data produced by a service to be consumed or stored elsewhere. The Service Bus is for high-value enterprise messaging, and is used for order processing and financial transactions.

Reference: https://docs.microsoft.com/en-us/azure/event-grid/compare-messaging-services

QUESTION 3
Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You are developing an Azure Service application that processes queue data when it receives a message from a mobile application. Messages may not be sent to the service consistently.

You have the following requirements:

▪ Queue size must not grow larger than 80 gigabytes (GB).
▪ Use first-in-first-out (FIFO) ordering of messages.

▪ Minimize Azure costs.

You need to implement the messaging solution.

Solution: Use the .Net API to add a message to an Azure Service Bus Queue from the mobile application. Create an Azure Windows VM that is triggered from Azure Service Bus Queue.

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Don't use a VM, instead create an Azure Function App that uses an Azure Service Bus Queue trigger.

Reference:
https://docs.microsoft.com/en-us/azure/azure-functions/functions-create-storage-queue-triggered-function