AZ-204

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AZ-204

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Develop Azure compute solutions

Testlet 1

Case study

This is a case study. **Case studies are not timed separately. You can use as much exam time as you would like to complete each case.** However, there may be additional case studies and sections on this exam. You must manage your time to ensure that you are able to complete all questions included on this exam in the time provided.

To answer the questions included in a case study, you will need to reference information that is provided in the case study. Case studies might contain exhibits and other resources that provide more information about the scenario that is described in the case study. Each question is independent of the other questions in this case study.

At the end of this case study, a review screen will appear. This screen allows you to review your answers and to make changes before you move to the next section of the exam. After you begin a new section, you cannot return to this section.

To start the case study
To display the first question in this case study, click the **Next** button. Use the buttons in the left pane to explore the content of the case study before you answer the questions. Clicking these buttons displays information such as business requirements, existing environment, and problem statements. When you are ready to answer a question, click the **Question** button to return to the question.

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.
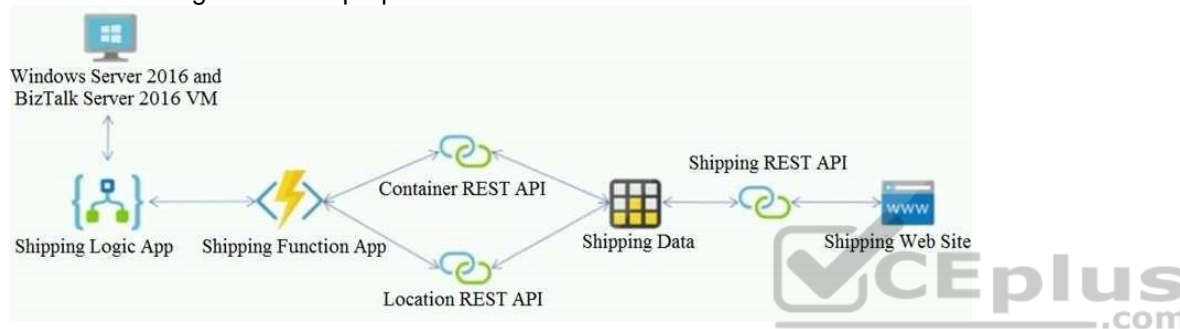
Shipping Data

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

Testlet 2

Case study

This is a case study. **Case studies are not timed separately. You can use as much exam time as you would like to complete each case.** However, there may be additional case studies and sections on this exam. You must manage your time to ensure that you are able to complete all questions included on this exam in the time provided.

To answer the questions included in a case study, you will need to reference information that is provided in the case study. Case studies might contain exhibits and other resources that provide more information about the scenario that is described in the case study. Each question is independent of the other questions in this case study.

At the end of this case study, a review screen will appear. This screen allows you to review your answers and to make changes before you move to the next section of the exam. After you begin a new section, you cannot return to this section.

To start the case study

To display the first question in this case study, click the **Next** button. Use the buttons in the left pane to explore the content of the case study before you answer the questions. Clicking these buttons displays information such as business requirements, existing environment, and problem statements. When you are ready to answer a question, click the **Question** button to return to the question.

Background

City Power & Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.

Current environment
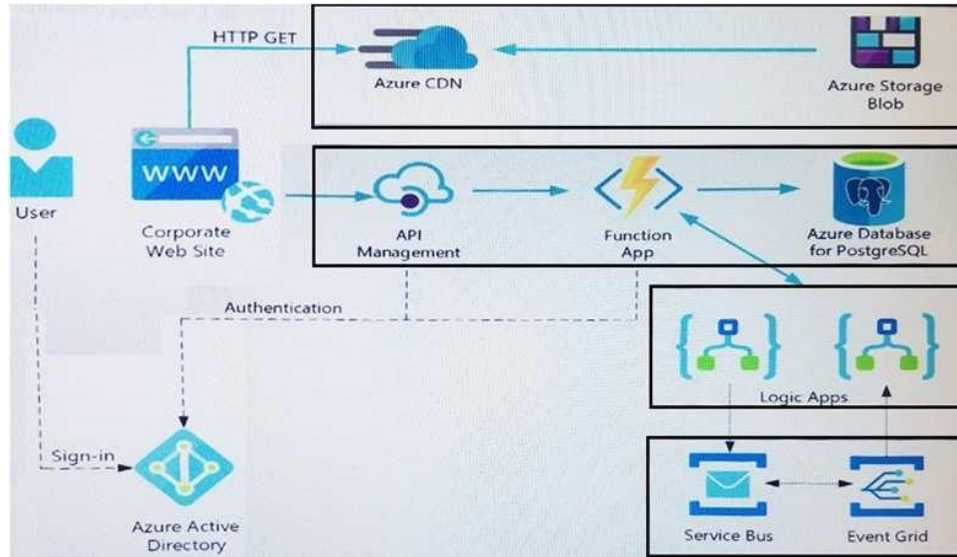
Architecture overview

The company has a public website located at http://www.cpandl.com/. The site is a single-page web application that runs in Azure App Service on Linux. The website uses files stored in Azure Storage and cached in Azure Content Delivery Network (CDN) to serve static content.

API Management and Azure Function App functions are used to process and store data in Azure Database for PostgreSQL. API Management is used to broker communications to the Azure Function app functions for Logic app integration. Logic apps are used to orchestrate the data processing while Service Bus and Event Grid handle messaging and events.

The solution uses Application Insights, Azure Monitor, and Azure Key Vault.

Architecture diagram

The company has several applications and services that support their business. The company plans to implement serverless computing where possible. The overall architecture is shown below.

User authentication

The following steps detail the user authentication process:

1. The user selects **Sign in** in the website.
2. The browser redirects the user to the Azure Active Directory (Azure AD) sign in page.
3. The user signs in.
4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('aud') claim in the access token.
6. The back-end API validates the access token.

Requirements

Corporate website

- Communications and content must be secured by using SSL.
- Communications must use HTTPS.
- Data must be replicated to a secondary region and three availability zones. ·
Data storage costs must be minimized.

Azure Database for PostgreSQL

The database connection string is stored in Azure Key Vault with the following attributes:

- Azure Key Vault name: cpandlkeyvault
- Secret name: PostgreSQLConn
- Id: 80df3e46ffcd4f1cb187f79905e9a1e8

The connection information is updated frequently. The application must always use the latest information to connect to the database.

Azure Service Bus and Azure Event Grid

- Azure Event Grid must use Azure Service Bus for queue-based load leveling.
- Events in Azure Event Grid must be routed directly to Service Bus queues for use in buffering.
- Events from Azure Service Bus and other Azure services must continue to be routed to Azure Event Grid for processing.

Security

- All SSL certificates and credentials must be stored in Azure Key Vault.
- File access must restrict access by IP, protocol, and Azure AD rights.
- All user accounts and processes must receive only those privileges which are essential to perform their intended function.

Compliance

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons. **Issues**

Corporate website

While testing the site, the following error message displays:
```
CryptographicException: The system cannot find the file specified.
```

Function app

You perform local testing for the RequestUserApproval function. The following error message displays:
```
'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'
```

The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:
```
FunctionAppLogs
```

```
| where FunctionName = = "RequestUserApproval"
```

Logic app

You test the Logic app in a development environment. The following error message displays:
```
'400 Bad Request'
```
Troubleshooting of the error shows an HttpTrigger action to call the RequestUserApproval function.

Code Corporate

website

Security.cs:

```
SC01 public class Security
SC02 {
SC03 var bytes = System.IO.File.ReadAllBytes("~/var/ssl/private");
SC04 var cert = new System.Security.Cryptography.X509Certificate2(bytes);
SC05 var certName = cert.FriendlyName;
SC06 }
```

Function app

RequestUserApproval.cs:

```
RA01 public static class RequestUserApproval
RA02 {
RA03 [FunctionName("RequestUserApproval")]
RA04 public static async Task<IActionResult> Run(
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req.
ILogger log)
RA06 {
RA07    log.LogInformation("RequestUserApproval function processed a request.");
RA08 ...
RA09 return ProcessRequest(req)
RA10    ? (ActionResult)new OkObjectResult($"User approval processed")
RA11    : new BadRequestObjectResult("Failed to process user approval");
RA12 }
RA13 private static bool ProcessRequest(HttpRequest req)
RA14 {
RA15    ...
RA16 }
RA17 }
```

QUESTION 1
You need to correct the RequestUserApproval Function app error.

What should you do?

A. Update line RA13 to use the `async` keyword and return an HttpRequest object value.

B. Configure the Function app to use an App Service hosting plan. Enable the **Always On** setting of the hosting plan.
C. Update the function to be stateful by using Durable Functions to process the request payload.
D. Update the functionTimeout property of the host.json project file to 15 minutes.

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Async operation tracking
The HTTP response mentioned previously is designed to help implement long-running HTTP async APIs with Durable Functions. This pattern is sometimes referred to as the polling consumer pattern.
Both the client and server implementations of this pattern are built into the Durable Functions HTTP APIs.

Function app

You perform local testing for the RequestUserApproval function. The following error message displays:
'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'

The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:
FunctionAppLogs
| where FunctionName = = "RequestUserApproval"

References:
https://docs.microsoft.com/en-us/azure/azure-functions/durable/durable-functions-http-features

Develop Azure compute solutions

Question Set 3

QUESTION 1
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 2
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.
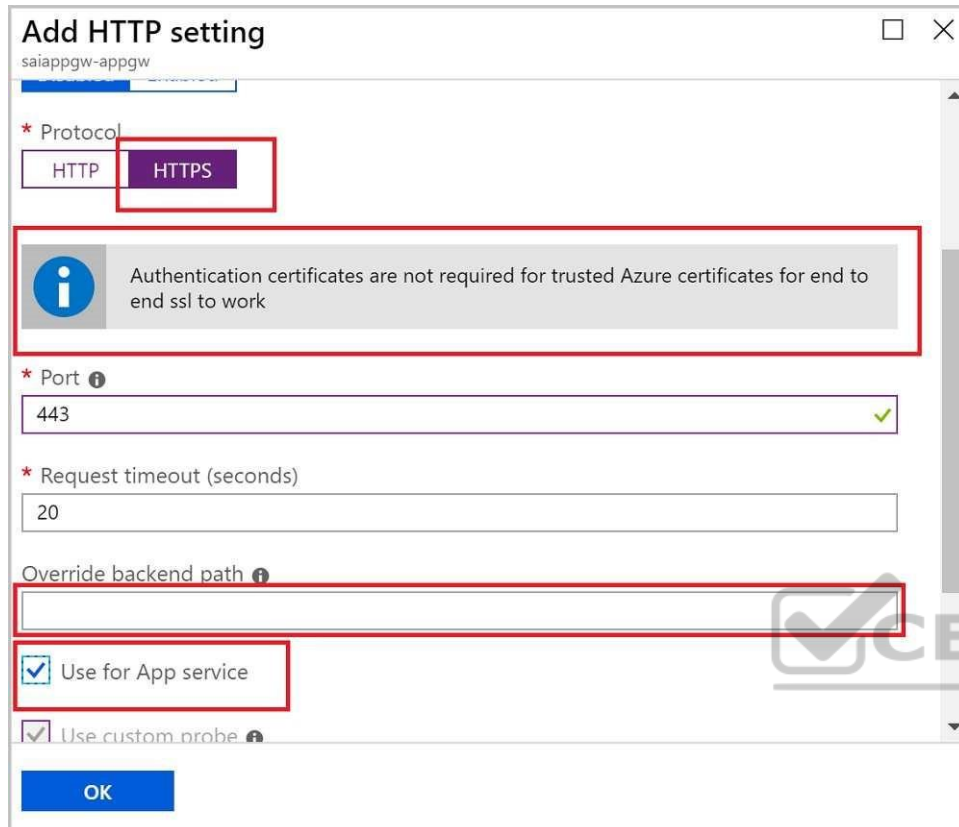The ability to derive the host name from the IP or FQDN of the back-end pool members. HTTP settings also provide an option to dynamically pick the host name from a back-end pool member's FQDN if configured with the option to derive host name from an individual back-end pool member.

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

Reference: https://docs.microsoft.com/en-us/azure/application-gateway/application-gateway-web-app-overview

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 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: 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 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.

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 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 5
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 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: 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 6
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 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.

```
<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
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 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: 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.

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

QUESTION 8
You develop a website. You plan to host the website in Azure. You expect the website to experience high traffic volumes after it is published.

You must ensure that the website remains available and responsive while minimizing cost.

You need to deploy the website.

What should you do?

A. Deploy the website to a virtual machine. Configure the virtual machine to automatically scale when the CPU load is high.
B. Deploy the website to an App Service that uses the Shared service tier. Configure the App Service plan to automatically scale when the CPU load is high.
C. Deploy the website to a virtual machine. Configure a Scale Set to increase the virtual machine instance count when the CPU load is high.
D. Deploy the website to an App Service that uses the Standard service tier. Configure the App Service plan to automatically scale when the CPU load is high.

Correct Answer: D

Section: (none)
Explanation

Explanation/Reference:
Explanation:
Windows Azure Web Sites (WAWS) offers 3 modes: Standard, Free, and Shared.

Standard mode carries an enterprise-grade SLA (Service Level Agreement) of 99.9% monthly, even for sites with just one instance.
Standard mode runs on dedicated instances, making it different from the other ways to buy Windows Azure Web Sites.

Incorrect Answers:
B: Shared and Free modes do not offer the scaling flexibility of Standard, and they have some important limits.
Shared mode, just as the name states, also uses shared Compute resources, and also has a CPU limit. So, while neither Free nor Shared is likely to be the best choice for your production environment due to these limits.

QUESTION 9
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 develop an HTTP triggered Azure Function app to process Azure Storage blob data. The app is triggered using an output binding on the blob.

The app continues to time out after four minutes. The app must process the blob data.

You need to ensure the app does not time out and processes the blob data.

Solution: Use the Durable Function async pattern to process the blob data.

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:

Instead pass the HTTP trigger payload into an Azure Service Bus queue to be processed by a queue trigger function and return an immediate HTTP success response.

Note: Large, long-running functions can cause unexpected timeout issues. General best practices include:
Whenever possible, refactor large functions into smaller function sets that work together and return responses fast. For example, a webhook or HTTP trigger function might require an acknowledgment response within a certain time limit; it's common for webhooks to require an immediate response. You can pass the HTTP trigger payload into a queue to be processed by a queue trigger function. This approach lets you defer the actual work and return an immediate response.

Reference:

https://docs.microsoft.com/en-us/azure/azure-functions/functions-best-practices

QUESTION 10
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 develop an HTTP triggered Azure Function app to process Azure Storage blob data. The app is triggered using an output binding on the blob.

The app continues to time out after four minutes. The app must process the blob data.

You need to ensure the app does not time out and processes the blob data.

Solution: Pass the HTTP trigger payload into an Azure Service Bus queue to be processed by a queue trigger function and return an immediate HTTP success response.

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Large, long-running functions can cause unexpected timeout issues. General best practices include:

Whenever possible, refactor large functions into smaller function sets that work together and return responses fast. For example, a webhook or HTTP trigger function might require an acknowledgment response within a certain time limit; it's common for webhooks to require an immediate response. You can pass the HTTP trigger payload into a queue to be processed by a queue trigger function. This approach lets you defer the actual work and return an immediate response.

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

QUESTION 11
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 develop an HTTP triggered Azure Function app to process Azure Storage blob data. The app is triggered using an output binding on the blob.

The app continues to time out after four minutes. The app must process the blob data.

You need to ensure the app does not time out and processes the blob data.

Solution: Configure the app to use an App Service hosting plan and enable the Always On setting.

Does the solution meet the goal?

A. Yes
B. No

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Instead pass the HTTP trigger payload into an Azure Service Bus queue to be processed by a queue trigger function and return an immediate HTTP success response.

Note: Large, long-running functions can cause unexpected timeout issues. General best practices include:
Whenever possible, refactor large functions into smaller function sets that work together and return responses fast. For example, a webhook or HTTP trigger function might require an acknowledgment response within a certain time limit; it's common for webhooks to require an immediate response. You can pass the HTTP trigger payload into a queue to be processed by a queue trigger function. This approach lets you defer the actual work and return an immediate response.

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

QUESTION 12
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 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.

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

Develop for Azure storage

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 configure the ContentUploadService deployment.

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

https://vceplus.com/ 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

Testlet 2

Case study

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Background

City Power & Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.
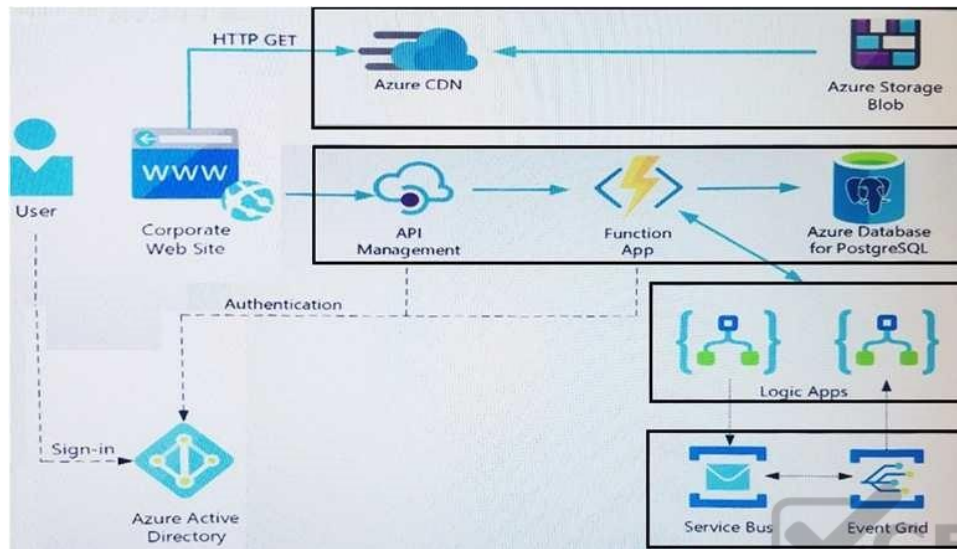
Current environment

Architecture overview

The company has a public website located at http://www.cpandl.com/. The site is a single-page web application that runs in Azure App Service on Linux. The website uses files stored in Azure Storage and cached in Azure Content Delivery Network (CDN) to serve static content.

API Management and Azure Function App functions are used to process and store data in Azure Database for PostgreSQL. API Management is used to broker communications to the Azure Function app functions for Logic app integration. Logic apps are used to orchestrate the data processing while Service Bus and Event Grid handle messaging and events.

The solution uses Application Insights, Azure Monitor, and Azure Key Vault.

Architecture diagram

The company has several applications and services that support their business. The company plans to implement serverless computing where possible. The overall architecture is shown below.

User authentication

The following steps detail the user authentication process:

1. The user selects **Sign in** in the website.
2. The browser redirects the user to the Azure Active Directory (Azure AD) sign in page.
3. The user signs in.
4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('aud') claim in the access token.
6. The back-end API validates the access token.

Requirements

Corporate website

- Communications and content must be secured by using SSL.
- Communications must use HTTPS.

▪ Data must be replicated to a secondary region and three availability zones. ▪
Data storage costs must be minimized.

Azure Database for PostgreSQL

The database connection string is stored in Azure Key Vault with the following attributes:

▪ Azure Key Vault name: cpandlkeyvault
▪ Secret name: PostgreSQLConn
▪ Id: 80df3e46ffcd4f1cb187f79905e9a1e8

The connection information is updated frequently. The application must always use the latest information to connect to the database.

Azure Service Bus and Azure Event Grid

▪ Azure Event Grid must use Azure Service Bus for queue-based load leveling.
▪ Events in Azure Event Grid must be routed directly to Service Bus queues for use in buffering.
▪ Events from Azure Service Bus and other Azure services must continue to be routed to Azure Event Grid for processing.

Security

▪ All SSL certificates and credentials must be stored in Azure Key Vault.
▪ File access must restrict access by IP, protocol, and Azure AD rights.
▪ All user accounts and processes must receive only those privileges which are essential to perform their intended function.

Compliance

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored

in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons. **Issues**

Corporate website

While testing the site, the following error message displays:
```
CryptographicException: The system cannot find the file specified.
```

Function app

You perform local testing for the RequestUserApproval function. The following error message displays:
```
'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'
```

The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:
```
FunctionAppLogs
| where FunctionName = = "RequestUserApproval"
```
Logic app

You test the Logic app in a development environment. The following error message displays:
```
'400 Bad Request'
```
Troubleshooting of the error shows an HttpTrigger action to call the RequestUserApproval function.

Code Corporate

website

Security.cs:

```
SC01 public class Security
SC02 {
SC03 var bytes = System.IO.File.ReadAllBytes("~/var/ssl/private");
SC04 var cert = new System.Security.Cryptography.X509Certificate2(bytes);
SC05 var certName = cert.FriendlyName;
SC06 }
```

Function app

RequestUserApproval.cs:
```
RA01 public static class RequestUserApproval
RA02 {
RA03 [FunctionName("RequestUserApproval")]
RA04 public static async Task<IActionResult> Run(
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req.
ILogger log)
RA06 {
RA07    log.LogInformation("RequestUserApproval function processed a request.");
RA08 ...
RA09 return ProcessRequest(req)
RA10    ? (ActionResult)new OkObjectResult($"User approval processed")
RA11    : new BadRequestObjectResult("Failed to process user approval");
RA12 }
RA13 private static bool ProcessRequest(HttpRequest req)
RA14 {
RA15    ...
RA16 }
RA17 }
```
Develop for Azure storage

Question Set 3

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

QUESTION 2
You are developing an Azure Cosmos DB solution by using the Azure Cosmos DB SQL API. The data includes millions of documents. Each document may contain hundreds of properties.

The properties of the documents do not contain distinct values for partitioning. Azure Cosmos DB must scale individual containers in the database to meet the performance needs of the application by spreading the workload evenly across all partitions over time.

You need to select a partition key.

Which two partition keys can you use? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

A. a single property value that does not appear frequently in the documents
B. a value containing the collection name
C. a single property value that appears frequently in the documents
D. a concatenation of multiple property values with a random suffix appended
E. a hash suffix appended to a property value

Correct Answer: DE
Section: (none)
Explanation

Explanation/Reference:
Explanation:
You can form a partition key by concatenating multiple property values into a single artificial partitionKey property. These keys are referred to as synthetic keys.

Another possible strategy to distribute the workload more evenly is to append a random number at the end of the partition key value. When you distribute items in this way, you can perform parallel write operations across partitions.

Note: It's the best practice to have a partition key with many distinct values, such as hundreds or thousands. The goal is to distribute your data and workload evenly across the items associated with these partition key values. If such a property doesn't exist in your data, you can construct a synthetic partition key.

Reference: https://docs.microsoft.com/en-us/azure/cosmos-db/synthetic-partition-keys

QUESTION 3
You are building a website that uses Azure Blob storage for data storage. You configure Azure Blob storage lifecycle to move all blobs to the archive tier after 30 days.

Customers have requested a service-level agreement (SLA) for viewing data older than 30 days.

You need to document the minimum SLA for data recovery.

Which SLA should you use?

A. at least two days
B. between one and 15 hours

C. at least one day

D. between zero and 60 minutes

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:

Explanation:

The archive access tier has the lowest storage cost. But it has higher data retrieval costs compared to the hot and cool tiers. Data in the archive tier can take several hours to retrieve depending on the priority of the rehydration. For small objects, a high priority rehydrate may retrieve the object from archive in under 1 hour.

Reference:

https://docs.microsoft.com/en-us/azure/storage/blobs/storage-blob-storage-tiers?tabs=azure-portal

Implement Azure security

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  }
```

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.
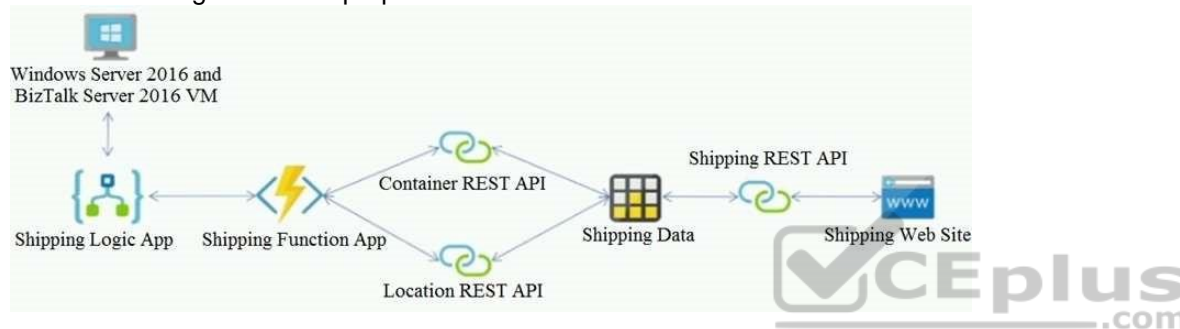
Shipping Data

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

Testlet 3

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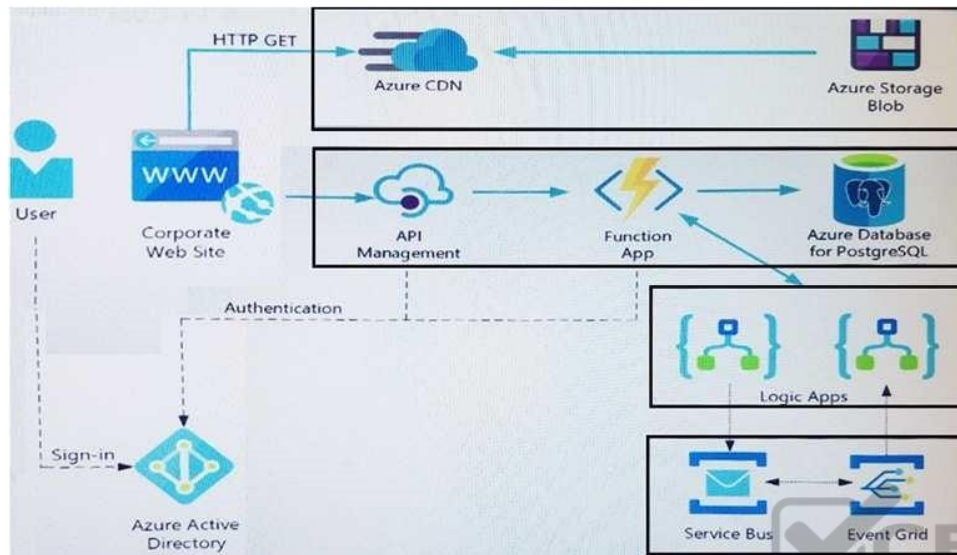
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Architecture overview

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4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('aud') claim in the access token.
6. The back-end API validates the access token.

Requirements

Corporate website

▪ Communications and content must be secured by using SSL.
▪ Communications must use HTTPS.

▪ Data must be replicated to a secondary region and three availability zones. ▪
Data storage costs must be minimized.

Azure Database for PostgreSQL

The database connection string is stored in Azure Key Vault with the following attributes:

▪ Azure Key Vault name: cpandlkeyvault
▪ Secret name: PostgreSQLConn
▪ Id: 80df3e46ffcd4f1cb187f79905e9a1e8

The connection information is updated frequently. The application must always use the latest information to connect to the database.

Azure Service Bus and Azure Event Grid

▪ Azure Event Grid must use Azure Service Bus for queue-based load leveling.
▪ Events in Azure Event Grid must be routed directly to Service Bus queues for use in buffering.
▪ Events from Azure Service Bus and other Azure services must continue to be routed to Azure Event Grid for processing.

Security

▪ All SSL certificates and credentials must be stored in Azure Key Vault.
▪ File access must restrict access by IP, protocol, and Azure AD rights.
▪ All user accounts and processes must receive only those privileges which are essential to perform their intended function.

Compliance

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored

in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons. **Issues**

Corporate website

While testing the site, the following error message displays:
```
CryptographicException: The system cannot find the file specified.
```

Function app

You perform local testing for the RequestUserApproval function. The following error message displays:
```
'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'
```

The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:

```
FunctionAppLogs
| where FunctionName = = "RequestUserApproval"
```

Logic app

You test the Logic app in a development environment. The following error message displays:

```
'400 Bad Request'
```

Troubleshooting of the error shows an HttpTrigger action to call the RequestUserApproval function.

Code Corporate

website

Security.cs:

```
SC01 public class Security
SC02 {
SC03 var bytes = System.IO.File.ReadAllBytes("~/var/ssl/private");
SC04 var cert = new System.Security.Cryptography.X509Certificate2(bytes);
SC05 var certName = cert.FriendlyName;
SC06 }
```

Function app

RequestUserApproval.cs:

```
RA01 public static class RequestUserApproval
RA02 {
RA03 [FunctionName("RequestUserApproval")]
RA04 public static async Task<IActionResult> Run(
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req.
ILogger log)
RA06 {
RA07     log.LogInformation("RequestUserApproval function processed a request.");
RA08 ...
RA09 return ProcessRequest(req)
RA10     ? (ActionResult)new OkObjectResult($"User approval processed")
RA11     : new BadRequestObjectResult("Failed to process user approval");
RA12 }
RA13 private static bool ProcessRequest(HttpRequest req)
RA14 {
RA15     ...
RA16 }
RA17 }
```

QUESTION 1

You need to authenticate the user to the corporate website as indicated by the architectural diagram.

Which two values should you use? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

A. ID token signature
B. ID token claims
C. HTTP response code
D. Azure AD endpoint URI
E. Azure AD tenant ID

Correct Answer: AD
Section: (none)
Explanation

Explanation/Reference:
Explanation:
A: Claims in access tokens
JWTs (JSON Web Tokens) are split into three pieces:
▪ Header - Provides information about how to validate the token including information about the type of token and how it was signed.
▪ Payload - Contains all of the important data about the user or app that is attempting to call your service. ▪ Signature - Is the raw material used to validate the token.

E: Your client can get an access token from either the v1.0 endpoint or the v2.0 endpoint using a variety of protocols.

Scenario: User authentication (see step 5 below)

The following steps detail the user authentication process:
1. The user selects Sign in in the website.
2. The browser redirects the user to the Azure Active Directory (Azure AD) sign in page.
3. The user signs in.
4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('aud') claim in the access token.
6. The back-end API validates the access token.

Reference:
https://docs.microsoft.com/en-us/azure/api-management/api-management-access-restriction-policies

Implement Azure security

Question Set 4

QUESTION 1
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 (Onpremises).
▪ 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 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 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 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.

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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 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: 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

QUESTION 5
You develop an app that allows users to upload photos and videos to Azure storage. The app uses a storage REST API call to upload the media to a blob storage account named Account1. You have blob storage containers named Container1 and Container2.

Uploading of videos occurs on an irregular basis.

You need to copy specific blobs from Container1 to Container2 when a new video is uploaded.

What should you do?

A. Copy blobs to Container2 by using the **Put Blob** operation of the Blob Service REST API

B. Create an **Event Grid** topic that uses the `Start-AzureStorageBlobCopy` cmdlet

C. Use `AzCopy` with the `Snapshot` switch to copy blobs to Container2

D. Download the blob to a virtual machine and then upload the blob to Container2

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation:
The Start-AzureStorageBlobCopy cmdlet starts to copy a blob.
Example 1: Copy a named blob
C:\PS>Start-AzureStorageBlobCopy -SrcBlob "ContosoPlanning2015" -DestContainer "ContosoArchives" -SrcContainer "ContosoUploads"

This command starts the copy operation of the blob named ContosoPlanning2015 from the container named ContosoUploads to the container named ContosoArchives.

Reference: https://docs.microsoft.com/en-us/powershell/module/azure.storage/start-azurestorageblobcopy?view=azurermps-6.13.0

QUESTION 6
You are developing an ASP.NET Core website that uses Azure FrontDoor. The website is used to build custom weather data sets for researchers. Data sets are downloaded by users as Comma Separated Value (CSV) files. The data is refreshed every 10 hours.

Specific files must be purged from the FrontDoor cache based upon Response Header values.

You need to purge individual assets from the Front Door cache.

Which type of cache purge should you use?

A. single path
B. wildcard
C. root domain

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
These formats are supported in the lists of paths to purge:
▪ Single path purge: Purge individual assets by specifying the full path of the asset (without the protocol and domain), with the file extension, for example, /pictures/ strasbourg.png;
▪ Wildcard purge: Asterisk (*) may be used as a wildcard. Purge all folders, subfolders, and files under an endpoint with /* in the path or purge all subfolders and files under a specific folder by specifying the folder followed by /*, for example, /pictures/*.
▪ Root domain purge: Purge the root of the endpoint with "/" in the path.

Reference: https://docs.microsoft.com/en-us/azure/frontdoor/front-door-caching

QUESTION 7
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 8
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-header
D. 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

Monitor, troubleshoot, and optimize Azure solutions

Testlet 1

Case study

This is a case study. **Case studies are not timed separately. You can use as much exam time as you would like to complete each case.** However, there may be additional case studies and sections on this exam. You must manage your time to ensure that you are able to complete all questions included on this exam in the time provided.

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To start the case study

To display the first question in this case study, click the **Next** button. Use the buttons in the left pane to explore the content of the case study before you answer the questions. Clicking these buttons displays information such as business requirements, existing environment, and problem statements. When you are ready to answer a question, click the **Question** button to return to the question.

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

Testlet 2

Case study

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Background

City Power & Light company provides electrical infrastructure monitoring solutions for homes and businesses. The company is migrating solutions to Azure.
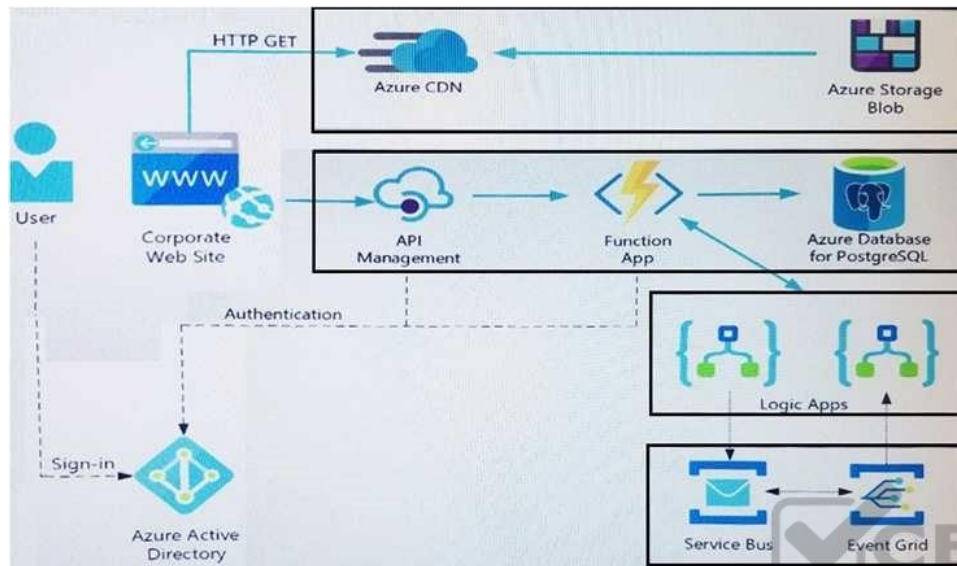
Current environment

Architecture overview

The company has a public website located at http://www.cpandl.com/. The site is a single-page web application that runs in Azure App Service on Linux. The website uses files stored in Azure Storage and cached in Azure Content Delivery Network (CDN) to serve static content.

API Management and Azure Function App functions are used to process and store data in Azure Database for PostgreSQL. API Management is used to broker communications to the Azure Function app functions for Logic app integration. Logic apps are used to orchestrate the data processing while Service Bus and Event Grid handle messaging and events.

The solution uses Application Insights, Azure Monitor, and Azure Key Vault.

Architecture diagram

The company has several applications and services that support their business. The company plans to implement serverless computing where possible. The overall architecture is shown below.

User authentication

The following steps detail the user authentication process:

1. The user selects **Sign in** in the website.
2. The browser redirects the user to the Azure Active Directory (Azure AD) sign in page.
3. The user signs in.
4. Azure AD redirects the user's session back to the web application. The URL includes an access token.
5. The web application calls an API and includes the access token in the authentication header. The application ID is sent as the audience ('aud') claim in the access token.
6. The back-end API validates the access token.

Requirements

Corporate website

- Communications and content must be secured by using SSL.
- Communications must use HTTPS.

▪ Data must be replicated to a secondary region and three availability zones. ▪
Data storage costs must be minimized.

Azure Database for PostgreSQL

The database connection string is stored in Azure Key Vault with the following attributes:

▪ Azure Key Vault name: cpandlkeyvault
▪ Secret name: PostgreSQLConn
▪ Id: 80df3e46ffcd4f1cb187f79905e9a1e8

The connection information is updated frequently. The application must always use the latest information to connect to the database.

Azure Service Bus and Azure Event Grid

▪ Azure Event Grid must use Azure Service Bus for queue-based load leveling.
▪ Events in Azure Event Grid must be routed directly to Service Bus queues for use in buffering.
▪ Events from Azure Service Bus and other Azure services must continue to be routed to Azure Event Grid for processing.

Security

▪ All SSL certificates and credentials must be stored in Azure Key Vault.
▪ File access must restrict access by IP, protocol, and Azure AD rights.
▪ All user accounts and processes must receive only those privileges which are essential to perform their intended function.

Compliance

Auditing of the file updates and transfers must be enabled to comply with General Data Protection Regulation (GDPR). The file updates must be read-only, stored

in the order in which they occurred, include only create, update, delete, and copy operations, and be retained for compliance reasons. **Issues**

Corporate website

While testing the site, the following error message displays:
`CryptographicException: The system cannot find the file specified.`

Function app

You perform local testing for the RequestUserApproval function. The following error message displays:
`'Timeout value of 00:10:00 exceeded by function: RequestUserApproval'`

The same error message displays when you test the function in an Azure development environment when you run the following Kusto query:

```
FunctionAppLogs
| where FunctionName = = "RequestUserApproval"
```

Logic app

You test the Logic app in a development environment. The following error message displays:

```
'400 Bad Request'
```

Troubleshooting of the error shows an HttpTrigger action to call the RequestUserApproval function.

Code Corporate

website

Security.cs:

```
SC01 public class Security
SC02 {
SC03 var bytes = System.IO.File.ReadAllBytes("~/var/ssl/private");
SC04 var cert = new System.Security.Cryptography.X509Certificate2(bytes);
SC05 var certName = cert.FriendlyName;
SC06 }
```

Function app

RequestUserApproval.cs:

```
RA01 public static class RequestUserApproval
RA02 {
RA03 [FunctionName("RequestUserApproval")]
RA04 public static async Task<IActionResult> Run(
RA05 [HttpTrigger(AuthorizationLevel.Function, "get", "post", Route = null)] HttpRequest req.
ILogger log)
RA06 {
RA07   log.LogInformation("RequestUserApproval function processed a request.");
RA08 ...
RA09 return ProcessRequest(req)
RA10   ? (ActionResult)new OkObjectResult($"User approval processed")
RA11   : new BadRequestObjectResult("Failed to process user approval");
RA12 }
RA13 private static bool ProcessRequest(HttpRequest req)
RA14 {
RA15   ...
RA16 }
RA17 }
```

QUESTION 1

You need to investigate the Azure Function app error message in the development environment.

What should you do?

A. Connect Live Metrics Stream from Application Insights to the Azure Function app and filter the metrics.
B. Create a new Azure Log Analytics workspace and instrument the Azure Function app with Application Insights.
C. Update the Azure Function app with extension methods from Microsoft.Extensions.Logging to log events by using the log instance.
D. Add a new diagnostic setting to the Azure Function app to send logs to Log Analytics.

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation:
Azure Functions offers built-in integration with Azure Application Insights to monitor functions.

The following areas of Application Insights can be helpful when evaluating the behavior, performance, and errors in your functions:

Live Metrics: View metrics data as it's created in near real-time.
Failures
Performance
Metrics

Reference:
https://docs.microsoft.com/en-us/azure/azure-functions/functions-monitoring

Monitor, troubleshoot, and optimize Azure solutions

Question Set 3

QUESTION 1
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 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: 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.

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

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. Determine whether the solution meets the stated goals.

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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

QUESTION 4
You develop and deploy an ASP.NET web app to Azure App Service. You use Application Insights telemetry to monitor the app.

You must test the app to ensure that the app is available and responsive from various points around the world and at regular intervals. If the app is not responding, you must send an alert to support staff.

You need to configure a test for the web app.

Which two test types can you use? Each correct answer presents a complete solution.

NOTE: Each correct selection is worth one point.

A. integration
B. multi-step web
C. URL ping
D. unit
E. load

Correct Answer: BC
Section: (none)
Explanation

Explanation/Reference:
Explanation:
There are three types of availability tests:
▪ URL ping test: a simple test that you can create in the Azure portal.

- Multi-step web test: A recording of a sequence of web requests, which can be played back to test more complex scenarios. Multi-step web tests are created in Visual Studio Enterprise and uploaded to the portal for execution.
- Custom Track Availability Tests: If you decide to create a custom application to run availability tests, the TrackAvailability() method can be used to send the results to Application Insights.

Reference: https://docs.microsoft.com/en-us/azure/azure-monitor/app/monitor-web-app-availability

QUESTION 5

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

Connect to and consume Azure services and third-party services

Testlet 1

Case study

This is a case study. **Case studies are not timed separately. You can use as much exam time as you would like to complete each case.** However, there may be additional case studies and sections on this exam. You must manage your time to ensure that you are able to complete all questions included on this exam in the time provided.

To answer the questions included in a case study, you will need to reference information that is provided in the case study. Case studies might contain exhibits and other resources that provide more information about the scenario that is described in the case study. Each question is independent of the other questions in this case study.

At the end of this case study, a review screen will appear. This screen allows you to review your answers and to make changes before you move to the next section of the exam. After you begin a new section, you cannot return to this section.

To start the case study

To display the first question in this case study, click the **Next** button. Use the buttons in the left pane to explore the content of the case study before you answer the questions. Clicking these buttons displays information such as business requirements, existing environment, and problem statements. When you are ready to answer a question, click the **Question** button to return to the question.

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.
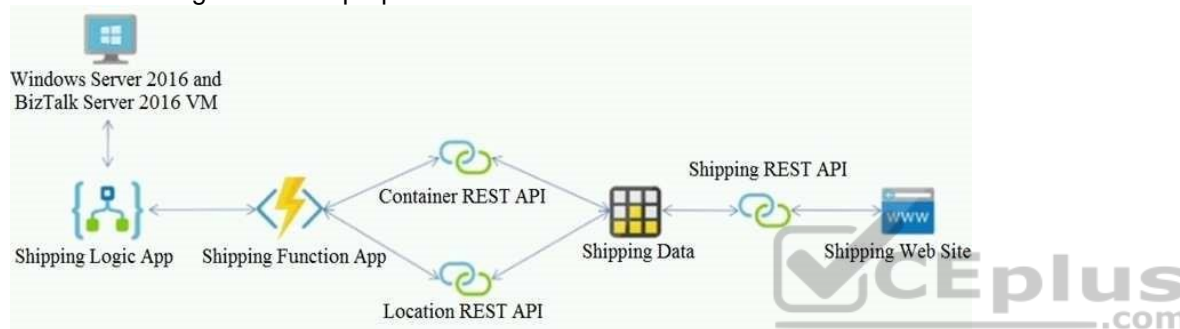
Shipping Data

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 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