

> Vendor: Microsoft

> Exam Code: DP-201

Exam Name: Implementing an Azure Data Solution

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QUESTION 126

You are developing an application that uses Azure Data Lake Storage Gen 2.

You need to recommend a solution to grant permissions to a specific application for a limited time period.

What should you include in the recommendation?

- A. Azure Active Directory (Azure AD) identities
- B. shared access signatures (SAS)
- C. account keys
- D. role assignments

Correct Answer: B Section: (none) Explanation

Explanation/Reference:

Explanation:

A shared access signature (SAS) is a URI that grants restricted access rights to Azure Storage resources.

You can provide a shared access signature to clients who should not be trusted with your storage account key but to whom you wish to delegate access to certain storage account resources. By distributing a shared access signature URI to these clients, you can grant them access to a resource for a specified period of time, with a specified set of permissions.

References:

https://docs.microsoft.com/en-us/rest/api/storageservices/delegate-access-with-shared-access-signature

QUESTION 127

You need to recommend a security solution to grant anonymous users permission to access the blobs in a specific container only. What

should you include in the recommendation?

- A. access keys for the storage account
- B. shared access signatures (SAS)
- C. Role assignments
- D. the public access level for the blobs service

Correct Answer: D Section: (none) Explanation

Explanation/Reference:

Explanation:

You can enable anonymous, public read access to a container and its blobs in Azure Blob storage. By doing so, you can grant read-only access to these resources without sharing your account key, and without requiring a shared access signature (SAS).

Public read access is best for scenarios where you want certain blobs to always be available for anonymous read access.

References:

https://docs.microsoft.com/en-us/azure/storage/blobs/storage-manage-access-to-resources

QUESTION 128

You are designing a solution that will use Azure Databricks and Azure Data Lake Storage Gen2. From

Databricks, you need to access Data Lake Storage directly by using a service principal.

What should you include in the solution?

- A. shared access signatures (SAS) in Data Lake Storage
- B. access keys in Data Lake Storage
- C. an organizational relationship in Azure Active Directory (Azure AD)
- D. an application registration in Azure Active Directory (Azure AD)

Correct Answer: D Section: (none) Explanation

Explanation/Reference:

Explanation:

Create and grant permissions to service principal

If your selected the access method requires a service principal with adequate permissions, and you do not have one, follow these steps:

1. Create an Azure AD application and service principal that can access resources. Note the following properties:

client-id: An ID that uniquely identifies the application.

directory-id: An ID that uniquely identifies the Azure AD instance. service-credential: A string that the application uses to prove its identity.

2. Register the service principal, granting the correct role assignment, such as Storage Blob Data

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3. Contributor, on the Azure Data Lake Storage Gen2 account.

References:

https://docs.databricks.com/data/data-sources/azure/azure-datalake-gen2.html

QUESTION 129

You are designing security for administrative access to Azure SQL Data Warehouse.

You need to recommend a solution to ensure that administrators use two-factor authentication when accessing the data warehouse from Microsoft SQL Server Management Studio (SSMS).

What should you include in the recommendation?

- A. Azure conditional access policies
- B. Azure Active Directory (Azure AD) Privileged Identity Management (PIM)
- C. Azure Key Vault secrets
- D. Azure Active Directory (Azure AD) Identity Protection

Correct Answer: A Section: (none) Explanation

Explanation/Reference:

Explanation:

https://docs.microsoft.com/en-us/azure/sql-database/sql-database-conditional-access

QUESTION 130

You design data engineering solutions for a company that has locations around the world. You plan to deploy a large set of data to Azure Cosmos DB. The

data must be accessible from all company locations.

You need to recommend a strategy for deploying the data that minimizes latency for data read operations and minimizes costs.

What should you recommend?

- A. Use a single Azure Cosmos DB account. Enable multi-region writes.
- B. Use a single Azure Cosmos DB account Configure data replication.
- C. Use multiple Azure Cosmos DB accounts. For each account, configure the location to the closest Azure datacenter.
- D. Use a single Azure Cosmos DB account. Enable geo-redundancy.
- E. Use multiple Azure Cosmos DB accounts. Enable multi-region writes.

Correct Answer: A Section: (none) Explanation

Explanation/Reference:

Explanation:

With Azure Cosmos DB, you can add or remove the regions associated with your account at any time.

Multi-region accounts configured with multiple-write regions will be highly available for both writes and reads. Regional failovers are instantaneous and don't require any changes from the application.

Operation type	Single region	Multi-region (single region writes)	Multi-region (multi- region writes)
Writes	99.99	99.99	99.999
Reads	99.99	99.999	99.999

References:

https://docs.microsoft.com/en-us/azure/cosmos-db/high-availability

QUESTION 131

Case Study 5 - Trey Research 2

Overview

You are a data engineer for Trey Research. The company is close to completing a joint project with the government to build smart highways infrastructure across North America. This involves the placement of sensors and cameras to measure traffic flow, car speed, and vehicle details.

You have been asked to design a cloud solution that will meet the business and technical requirements of the smart highway.

Solution components

Telemetry Capture

The telemetry capture system records each time a vehicle passes in front of a sensor. The sensors run on a custom embedded operating system and record the following telemetry data:

- Time
- Location in latitude and longitude
- Speed in kilometers per hour (kmph)
- Length of vehicle in meters

Visual Monitoring

The visual monitoring system is a network of approximately 1,000 cameras placed near highways that capture images of vehicle traffic every 2 seconds. The cameras record high resolution images. Each image is approximately 3 MB in size.

Requirements: Business



The company identifies the following business requirements:

- External vendors must be able to perform custom analysis of data using machine learning technologies.
- You must display a dashboard on the operations status page that displays the following metrics: telemetry, volume, and processing latency.
- Traffic data must be made available to the Government Planning Department for the purpose of modeling changes to the highway system. The traffic data will
 be used in conjunction with other data such as information about events such as sporting events, weather conditions, and population statistics. External data
 used during the modeling is stored in on-premises SQL Server 2016 databases and CSV files stored in an Azure Data Lake Storage Gen2 storage account.
- Information about vehicles that have been detected as going over the speed limit during the last 30 minutes must be available to law enforcement officers.
 Several law enforcement organizations may respond to speeding vehicles.
- The solution must allow for searches of vehicle images by license plate to support law enforcement investigations. Searches must be able to be performed using a query language and must support fuzzy searches to compensate for license plate detection errors.

Requirements: Security

The solution must meet the following security requirements:

- External vendors must not have direct access to sensor data or images.
- Images produced by the vehicle monitoring solution must be deleted after one month. You must minimize costs associated with deleting images from the data store.
- Unauthorized usage of data must be detected in real time. Unauthorized usage is determined by looking for unusual usage patterns.
- All changes to Azure resources used by the solution must be recorded and stored. Data must be provided to the security team for incident response purposes.

Requirements: Sensor data

You must write all telemetry data to the closest Azure region. The sensors used for the telemetry capture system have a small amount of memory available and so must write data as quickly as possible to avoid losing telemetry data.

You need to design the storage for the visual monitoring system.

Which storage solution should you recommend?

- A. Azure Blob storage
- B. Azure Table storage
- C. Azure SQL database
- D. Azure Media Services

Correct Answer: A Section: (none) Explanation

Explanation/Reference:

Explanation:

Azure Blobs: A massively scalable object store for text and binary data.

Scenario

The visual monitoring system is a network of approximately 1,000 cameras placed near highways that capture images of vehicle traffic every 2 seconds. The cameras record high resolution images. Each image is approximately 3 MB in size.

The solution must allow for searches of vehicle images by license plate to support law enforcement investigations. Searches must be able to be performed using a query language and must support fuzzy searches to compensate for license plate detection errors.

Incorrect Answers:

B: Azure Tables: A NoSQL store for schemaless storage of structured data.

D: Microsoft Azure Media Services (AMS) is a leading full-service media platform for securely delivering live and on-demand video to virtually any device. Reference: https://docs.microsoft.com/en-us/azure/storage/common/storage-introduction

QUESTION 132

Case Study 5 - Trey Research 2

Overview

You are a data engineer for Trey Research. The company is close to completing a joint project with the government to build smart highways infrastructure across North America. This involves the placement of sensors and cameras to measure traffic flow, car speed, and vehicle details.

You have been asked to design a cloud solution that will meet the business and technical requirements of the smart highway.

Solution components

Telemetry Capture

The telemetry capture system records each time a vehicle passes in front of a sensor. The sensors run on a custom embedded operating system and record the following telemetry data:

- Time
- Location in latitude and longitude
- Speed in kilometers per hour (kmph)
- Length of vehicle in meters

Visual Monitoring

The visual monitoring system is a network of approximately 1,000 cameras placed near highways that capture images of vehicle traffic every 2 seconds. The cameras record high resolution images. Each image is approximately 3 MB in size.

Requirements: Business

The company identifies the following business requirements:

- External vendors must be able to perform custom analysis of data using machine learning technologies.
- You must display a dashboard on the operations status page that displays the following metrics: telemetry, volume, and processing latency.
- Traffic data must be made available to the Government Planning Department for the purpose of modeling changes to the highway system. The traffic data will be used in conjunction with other data such as information about events such as sporting events, weather conditions, and population statistics. External data used during the modeling is stored in on-premises SQL Server 2016 databases and CSV files stored in an Azure Data Lake Storage Gen2 storage account.
- Information about vehicles that have been detected as going over the speed limit during the last 30 minutes must be available to law enforcement officers.
 Several law enforcement organizations may respond to speeding vehicles.
- The solution must allow for searches of vehicle images by license plate to support law enforcement investigations. Searches must be able to be performed using a query language and must support fuzzy searches to compensate for license plate detection errors.

Requirements: Security

The solution must meet the following security requirements:

External vendors must not have direct access to sensor data or images.



- Images produced by the vehicle monitoring solution must be deleted after one month. You must minimize costs associated with deleting images from the data store
- Unauthorized usage of data must be detected in real time. Unauthorized usage is determined by looking for unusual usage patterns.
- All changes to Azure resources used by the solution must be recorded and stored. Data must be provided to the security team for incident response purposes.

Requirements: Sensor data

You must write all telemetry data to the closest Azure region. The sensors used for the telemetry capture system have a small amount of memory available and so must write data as quickly as possible to avoid losing telemetry data.

You need to design the storage for the telemetry capture system.

What storage solution should you use in the design?

- A. Azure SQL Synapse Analytics
- B. Azure Databricks
- C. Azure Cosmos DB

Correct Answer: C Section: (none) Explanation

Explanation/Reference:

Explanation:

Azure Cosmos DB is a globally distributed database service. You can associate any number of Azure regions with your Azure Cosmos account and your data is automatically and transparently replicated.

Scenario:

Telemetry Capture

The telemetry capture system records each time a vehicle passes in front of a sensor. The sensors run on a custom embedded operating system and record the following telemetry data:

Time Location in latitude and longitude

Speed in kilometers per hour (kmph)

Length of vehicle in meters

You must write all telemetry data to the closest Azure region. The sensors used for the telemetry capture system have a small amount of memory available and so must write data as quickly as possible to avoid losing telemetry data.

Reference:

https://docs.microsoft.com/en-us/azure/cosmos-db/regional-presence

QUESTION 133

Case Study 5 - Trey Research 2

Overview

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You have been asked to design a cloud solution that will meet the business and technical requirements of the smart highway.

Solution components

Telemetry Capture

The telemetry capture system records each time a vehicle passes in front of a sensor. The sensors run on a custom embedded operating system and record the following telemetry data:

- Time
- Location in latitude and longitude
- Speed in kilometers per hour (kmph)
- Length of vehicle in meters

Visual Monitoring

The visual monitoring system is a network of approximately 1,000 cameras placed near highways that capture images of vehicle traffic every 2 seconds. The cameras record high resolution images. Each image is approximately 3 MB in size.

Requirements: Business

The company identifies the following business requirements:

- External vendors must be able to perform custom analysis of data using machine learning technologies.
- You must display a dashboard on the operations status page that displays the following metrics: telemetry, volume, and processing latency.
- Traffic data must be made available to the Government Planning Department for the purpose of modeling changes to the highway system. The traffic data will be used in conjunction with other data such as information about events such as sporting events, weather conditions, and population statistics. External data used during the modeling is stored in on-premises SQL Server 2016 databases and CSV files stored in an Azure Data Lake Storage Gen2 storage account.
- Information about vehicles that have been detected as going over the speed limit during the last 30 minutes must be available to law enforcement officers. Several law enforcement organizations may respond to speeding vehicles.
- The solution must allow for searches of vehicle images by license plate to support law enforcement investigations. Searches must be able to be performed using a query language and must support fuzzy searches to compensate for license plate detection errors.

Requirements: Security

The solution must meet the following security requirements:

- External vendors must not have direct access to sensor data or images.
- Images produced by the vehicle monitoring solution must be deleted after one month. You must minimize costs associated with deleting images from the data store.
- Unauthorized usage of data must be detected in real time. Unauthorized usage is determined by looking for unusual usage patterns.
- All changes to Azure resources used by the solution must be recorded and stored. Data must be provided to the security team for incident response purposes.

Requirements: Sensor data

You must write all telemetry data to the closest Azure region. The sensors used for the telemetry capture system have a small amount of memory available and so must write data as quickly as possible to avoid losing telemetry data.

You need to design the solution for the government planning department.

Which services should you include in the design?



- A. Azure Synapse Analytics and Elastic Queries
- B. Azure SQL Database and Polybase
- C. Azure Synapse Analytics and Polybase
- D. Azure SQL Database and Elastic Queries

Correct Answer: C Section: (none) Explanation

Explanation/Reference:

Explanation:

PolyBase is a new feature in SQL Server 2016. It is used to guery relational and non-relational databases (NoSQL) such as CSV files.

Scenario: Traffic data must be made available to the Government Planning Department for the purpose of modeling changes to the highway system. The traffic data will be used in conjunction with other data such as information about events such as sporting events, weather conditions, and population statistics. External data used during the modeling is stored in on-premises SQL Server 2016 databases and CSV files stored in an Azure Data Lake Storage Gen2 storage

Reference:

https://www.sqlshack.com/sql-server-2016-polybase-tutorial/

QUESTION 134

Case Study 5 - Trey Research 2

Overview

You are a data engineer for Trey Research. The company is close to completing a joint project with the government to build smart highways infrastructure across North America. This involves the placement of sensors and cameras to measure traffic flow, car speed, and vehicle details.

You have been asked to design a cloud solution that will meet the business and technical requirements of the smart highway.

Solution components

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- Time
- Location in latitude and longitude
- Speed in kilometers per hour (kmph)
- Length of vehicle in meters

Visual Monitoring

The visual monitoring system is a network of approximately 1,000 cameras placed near highways that capture images of vehicle traffic every 2 seconds. The cameras record high resolution images. Each image is approximately 3 MB in size.

Requirements: Business

The company identifies the following business requirements:

- External vendors must be able to perform custom analysis of data using machine learning technologies.
- You must display a dashboard on the operations status page that displays the following metrics: telemetry, volume, and processing latency.
- Traffic data must be made available to the Government Planning Department for the purpose of modeling changes to the highway system. The traffic data will
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 Several law enforcement organizations may respond to speeding vehicles.
- The solution must allow for searches of vehicle images by license plate to support law enforcement investigations. Searches must be able to be performed using a query language and must support fuzzy searches to compensate for license plate detection errors.

Requirements: Security

The solution must meet the following security requirements:

- External vendors must not have direct access to sensor data or images.
- Images produced by the vehicle monitoring solution must be deleted after one month. You must minimize costs associated with deleting images from the data store.
- Unauthorized usage of data must be detected in real time. Unauthorized usage is determined by looking for unusual usage patterns.
- All changes to Azure resources used by the solution must be recorded and stored. Data must be provided to the security team for incident response purposes.

Requirements: Sensor data

You must write all telemetry data to the closest Azure region. The sensors used for the telemetry capture system have a small amount of memory available and so must write data as quickly as possible to avoid losing telemetry data.

You need to design the unauthorized data usage detection system.

What Azure service should you include in the design?

- A. Azure Analysis Services
- B. Azure SQL Data Warehouse
- C. Azure Databricks
- D. Azure Data Factory

Correct Answer: B Section: (none) Explanation

Explanation/Reference:

Explanation:

SQL Database and SQL Data Warehouse

SQL threat detection identifies anomalous activities indicating unusual and potentially harmful attempts to access or exploit databases.

Advanced Threat Protection for Azure SQL Database and SQL Data Warehouse detects anomalous activities indicating unusual and potentially harmful attempts to access or exploit databases.

Scenario:

Requirements. Security



The solution must meet the following security requirements:

Unauthorized usage of data must be detected in real time. Unauthorized usage is determined by looking for unusual usage patterns.

Reference:

https://docs.microsoft.com/en-us/azure/sql-database/sql-database-threat-detection-overview

QUESTION 135 Case Study 5 - Trey Research 2

Overview

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You have been asked to design a cloud solution that will meet the business and technical requirements of the smart highway.

Solution components

Telemetry Capture

The telemetry capture system records each time a vehicle passes in front of a sensor. The sensors run on a custom embedded operating system and record the following telemetry data:

- Time
- Location in latitude and longitude
- Speed in kilometers per hour (kmph)
- Length of vehicle in meters

Visual Monitoring

The visual monitoring system is a network of approximately 1,000 cameras placed near highways that capture images of vehicle traffic every 2 seconds. The cameras record high resolution images. Each image is approximately 3 MB in size.

Requirements: Business

The company identifies the following business requirements:

- External vendors must be able to perform custom analysis of data using machine learning technologies.
- You must display a dashboard on the operations status page that displays the following metrics: telemetry, volume, and processing latency.
- Traffic data must be made available to the Government Planning Department for the purpose of modeling changes to the highway system. The traffic data will be used in conjunction with other data such as information about events such as sporting events, weather conditions, and population statistics. External data used during the modeling is stored in on-premises SQL Server 2016 databases and CSV files stored in an Azure Data Lake Storage Gen2 storage account.
- Information about vehicles that have been detected as going over the speed limit during the last 30 minutes must be available to law enforcement officers.
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- The solution must allow for searches of vehicle images by license plate to support law enforcement investigations. Searches must be able to be performed using a query language and must support fuzzy searches to compensate for license plate detection errors.

Requirements: Security

The solution must meet the following security requirements:

- External vendors must not have direct access to sensor data or images.
- Images produced by the vehicle monitoring solution must be deleted after one month. You must minimize costs associated with deleting images from the data store.
- Unauthorized usage of data must be detected in real time. Unauthorized usage is determined by looking for unusual usage patterns.
- All changes to Azure resources used by the solution must be recorded and stored. Data must be provided to the security team for incident response purposes.

Requirements: Sensor data

You must write all telemetry data to the closest Azure region. The sensors used for the telemetry capture system have a small amount of memory available and so must write data as quickly as possible to avoid losing telemetry data.

Drag and Drop Question

You need to design the system for notifying law enforcement officers about speeding vehicles.

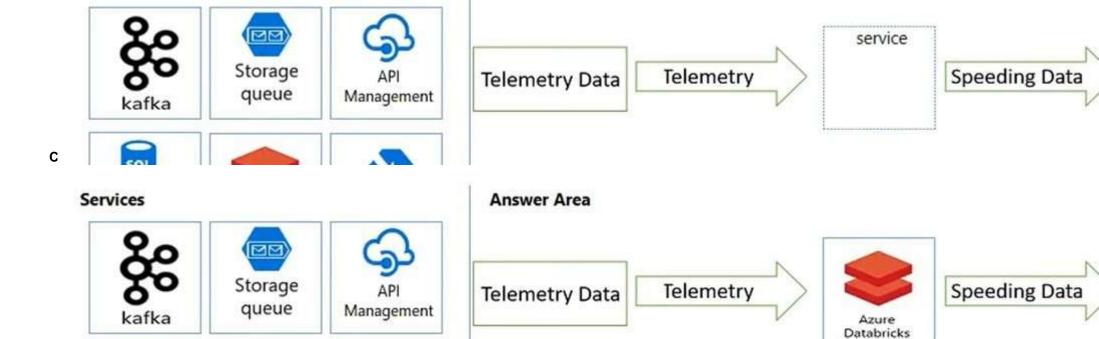
Traffic Manager

How should you design the pipeline? To answer, drag the appropriate services to the correct locations. Each service may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

NOTE: Each correct selection is worth one point.

Select and Place:

Services

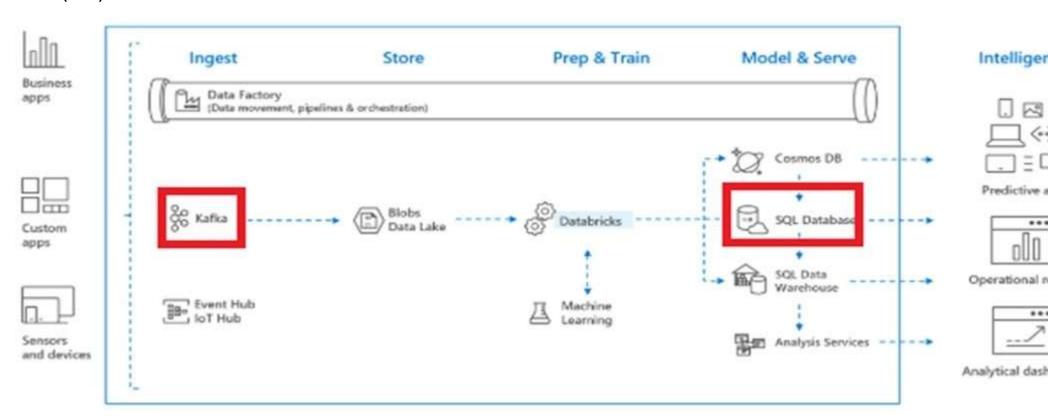


Answer Area



Intelliger

Section: (none)



Scenario:

Information about vehicles that have been detected as going over the speed limit during the last 30 minutes must be available to law enforcement officers. Several law enforcement organizations may respond to speeding vehicles. **Telemetry Capture**

The telemetry capture system records each time a vehicle passes in front of a sensor. The sensors run on a custom embedded operating system and record the following telemetry data:

Time Location in latitude and longitude Speed in kilometers per hour (kmph) Length of vehicle in meters

https://docs.microsoft.com/en-us/azure/azure-databricks/what-is-azure-databricks

QUESTION 136 Case Study 6 - Litware, Inc

Overview

Reference:

Litware, Inc. owns and operates 300 convenience stores across the US. The company sells a variety of packaged foods and drinks, as well as a variety of prepared foods, such as sandwiches and pizzas.

Litware has a loyalty club whereby members can get daily discounts on specific items by providing their membership number at checkout.

Litware employs business analysts who prefer to analyze data by using Microsoft Power BI, and data scientists who prefer analyzing data in Azure Databricks notebooks.

Requirements. Business Goals

Litware wants to create a new analytics environment in Azure to meet the following requirements:

- See inventory levels across the stores. Data must be updated as close to real time as possible.
- Execute ad hoc analytical queries on historical data to identify whether the loyalty club discounts increase sales of the discounted
- products. Every four hours, notify store employees about how many prepared food items to produce based on historical demand from the sales data.

Requirements. Technical Requirements

Litware identifies the following technical requirements:

- Minimize the number of different Azure services needed to achieve the business goals
- Use platform as a service (PaaS) offerings whenever possible and avoid having to provision virtual machines that must be managed
- by Litware. Ensure that the analytical data store is accessible only to the company's on-premises network and Azure services.
- Use Azure Active Directory (Azure AD) authentication
- whenever possible. Use the principle of least privilege when designing security.
- Stage inventory data in Azure Data Lake Storage Gen2 before loading the data into the analytical data store. Litware wants to remove transient data from Data Lake Storage once the data is no longer in use. Files that have a modified date that is older than 14 days must be removed.
- Limit the business analysts' access to customer contact information, such as phone numbers, because this type of data is not analytically
- relevant. Ensure that you can quickly restore a copy of the analytical data store within one hour in the event of corruption or accidental deletion.

Requirements. Planned Environment

Litware plans to implement the following environment:

- The application development team will create an Azure event hub to receive real-time sales data, including store number, date, time, product ID, customer loyalty number, price, and discount amount, from the point of sale (POS) system and output the data to data storage in Azure.
- Customer data, including name, contact information, and loyalty number, comes from Salesforce and can be imported into Azure once every eight hours. Row modified dates are not trusted in the source table.
- Product data, including product ID, name, and category, comes from Salesforce and can be imported into Azure once every eight hours. Row modified dates are not trusted in the source table.
- Daily inventory data comes from a Microsoft SQL server located on a private network.
- Litware currently has 5 TB of historical sales data and 100 GB of customer data. The company expects approximately 100 GB of new data per month for the next year.



- Litware will build a custom application named FoodPrep to provide store employees with the calculation results of how many prepared food items
 to produce every four hours.
- Litware does not plan to implement Azure ExpressRoute or a VPN between the on-premises network and Azure.

Which Azure service should you recommend for the analytical data store so that the business analysts and data scientists can execute ad hoc queries as quickly as possible?

- A. Azure Data Lake Storage Gen2
- B. Azure Cosmos DB
- C. Azure SQL Database
- D. Azure Synapse Analytics

Correct Answer: A Section: (none) Explanation

Explanation/Reference:

Explanation:

There are several differences between a data lake and a data warehouse. Data structure, ideal users, processing methods, and the overall purpose of the data are the key differentiators.

	Data Lake	Data Warehouse
Data Structure	Raw	Processed
Purpose of Data	Not Yet Determined	Currently In Use
Users	Data Scientists	Business Professionals
Accessibility	Highly accessible and quick to update	More complicated and costly to m

Scenario: Litware employs business analysts who prefer to analyze data by using Microsoft Power BI, and data scientists who prefer analyzing data in Azure Databricks notebooks.

Note: Azure Synapse Analytics formerly known as Azure SQL Data Warehouse.