Amazon

Exam Questions AWS-Certified-Data-Engineer-Associate

AWS Certified Data Engineer - Associate (DEA-C01)

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NEW QUESTION 1
A data engineer needs to join data from multiple sources to perform a one-time analysis job. The data is stored in Amazon DynamoDB, Amazon RDS, Amazon Redshift, and Amazon S3.
Which solution will meet this requirement MOST cost-effectively?

A. Use an Amazon EMR provisioned cluster to read from all source
B. Use Apache Spark to join the data and perform the analysis.
C. Copy the data from DynamoDB, Amazon RDS, and Amazon Redshift into Amazon S3. Run Amazon Athena queries directly on the S3 files.
D. Use Amazon Athena Federated Query to join the data from all data sources.
E. Use Redshift Spectrum to query data from DynamoDB, Amazon RDS, and Amazon S3 directly from Redshift.

Answer: C

Explanation:
Amazon Athena Federated Query is a feature that allows you to query data from multiple sources using standard SQL. You can use Athena Federated Query to join data from Amazon DynamoDB, Amazon RDS, Amazon Redshift, and Amazon S3, as well as other data sources such as MongoDB, Apache HBase, and Apache Kafka1. Athena Federated Query is a serverless and interactive service, meaning you do not need to provision or manage any infrastructure, and you only pay for the amount of data scanned by your queries. Athena Federated Query is the most cost-effective solution for performing a one-time analysis job on data from multiple sources, as it eliminates the need to copy or move data, and allows you to query data directly from the source.
The other options are not as cost-effective as Athena Federated Query, as they involve additional steps or costs. Option A requires you to provision and pay for an Amazon EMR cluster, which can be expensive and time-consuming for a one-time job. Option B requires you to copy or move data from DynamoDB, RDS, and Redshift to S3, which can incur additional costs for data transfer and storage, and also introduce latency and complexity. Option D requires you to have an existing Redshift cluster, which can be costly and may not be necessary for a one-time job. Option D also does not supportquerying data from RDS directly, so you would need to use Redshift Federated Query to access RDS data, which adds another layer of complexity2. References:
? Amazon Athena Federated Query
? Redshift Spectrum vs Federated Query

NEW QUESTION 2
A company stores datasets in JSON format and .csv format in an Amazon S3 bucket. The company has Amazon RDS for Microsoft SQL Server databases, Amazon DynamoDB tables that are in provisionedcapacity mode, and an Amazon Redshift cluster. A data engineering team must develop a solution that will give data scientists the ability to query all data sources by using syntax similar to SQL.
Which solution will meet these requirements with the LEAST operational overhead?

A. Use AWS Glue to crawl the data source
B. Store metadata in the AWS Glue Data Catalo
C. Use Amazon Athena to query the dat
D. Use SQL for structured data source
E. Use PartiQL for data that is stored in JSON format.
F. Use AWS Glue to crawl the data source
G. Store metadata in the AWS Glue Data Catalo
H. Use Redshift Spectrum to query the dat
I. Use SQL for structured data source
J. Use PartiQL for data that is stored in JSON format.
K. Use AWS Glue to crawl the data source
L. Store metadata in the AWS Glue Data Catalo
M. Use AWS Glue jobs to transform data that is in JSON format to Apache Parquet or .csv forma
N. Store the transformed data in an S3 bucke
O. Use Amazon Athena to query the original and transformed data from the S3 bucket.
P. Use AWS Lake Formation to create a data lak
Q. Use Lake Formation jobs to transform the data from all data sources to Apache Parquet forma
R. Store the transformed data in an S3 bucke
S. Use Amazon Athena or Redshift Spectrum to query the data.

Answer: A

Explanation:
The best solution to meet the requirements of giving data scientists the ability to query all data sources by using syntax similar to SQL with the least operational overhead is to use AWS Glue to crawl the data sources, store metadata in the AWS Glue Data Catalog, use Amazon Athena to query the data, use SQL for structured data sources, and use PartiQL for data that is stored in JSON format.
AWS Glue is a serverless data integration service that makes it easy to prepare, clean, enrich, and move data between data stores1. AWS Glue crawlers are processes that connect to a data store, progress through a prioritized list of classifiers to determine the schema for your data, and then create metadata tables in the Data Catalog2. The Data Catalog is a persistent metadata store that contains table definitions, job definitions, and other control information to help you manage your AWS Glue components3. You can use AWS Glue to crawl the data sources, such as Amazon S3, Amazon RDS for Microsoft SQL Server, and Amazon DynamoDB, and store the metadata in the Data Catalog.
Amazon Athena is a serverless, interactive query service that makes it easy to analyze data directly in Amazon S3 using standard SQL or Python4. Amazon Athena also supports PartiQL, a SQL-compatible query language that lets you query, insert, update, and delete data from semi-structured and nested data, such as JSON. You can use Amazon Athena to query the data from the Data Catalog using SQL for structured data sources, such as .csv files and relational databases, and PartiQL for data that is stored in JSON format. You can also use Athena to query data from other data sources, such as Amazon Redshift, using federated queries.
Using AWS Glue and Amazon Athena to query all data sources by using syntax similar to SQL is the least operational overhead solution, as you do not need to provision, manage, or scale any infrastructure, and you pay only for the resources you use. AWS Glue charges you based on the compute time and the data processed by your crawlers and ETL jobs1. Amazon Athena charges you based on the amount of data scanned by your queries. You can also reduce the cost and improve the performance of your queries by using compression, partitioning, and columnar formats for your data in Amazon S3.
Option B is not the best solution, as using AWS Glue to crawl the data sources, store metadata in the AWS Glue Data Catalog, and use Redshift Spectrum to query the data, would incur more costs and complexity than using Amazon Athena. Redshift Spectrum is a feature of Amazon Redshift, a fully managed data warehouse service, that allows you to query and join data across your data warehouse and your data lake using standard SQL. While Redshift Spectrum is powerful and useful for many data warehousing scenarios, it is not necessary or cost-effective for querying all data sources by using syntax similar to SQL. Redshift Spectrum charges you based on the amount of data scanned by your queries, which is similar to Amazon Athena, but it also requires you to have an Amazon Redshift cluster, which charges you based on the node type, the number of nodes, and the duration of the cluster5. These costs can add up quickly, especially if you have large volumes of data and complex queries. Moreover, using Redshift Spectrum would introduce additional latency and complexity, as you

would have to provision and manage the cluster, and create an external schema and database for the data in the Data Catalog, instead of querying it directly from Amazon Athena.
Option C is not the best solution, as using AWS Glue to crawl the data sources, store metadata in the AWS Glue Data Catalog, use AWS Glue jobs to transform data that is in JSON format to Apache Parquet or .csv format, store the transformed data in an S3 bucket, and use Amazon Athena to query the original and transformed data from the S3 bucket, would incur more costs and complexity than using Amazon Athena with PartiQL. AWS Glue jobs are ETL scripts that you can write in Python or Scala to transform your data and load it to your target data store. Apache Parquet is a columnar storage format that can improve the performance of analytical queries by reducing the amount of data that needs to be scanned and providing efficient compression and encoding schemes6. While using AWS Glue jobs and Parquet can improve the performance and reduce the cost of your queries, they would also increase the complexity and the operational overhead of the data pipeline, as you would have to write, run, and monitor the ETL jobs, and store the transformed data in a separate location in Amazon S3. Moreover, using AWS Glue jobs and Parquet would introduce additional latency, as you would have to wait for the ETL jobs to finish before querying the transformed data.
Option D is not the best solution, as using AWS Lake Formation to create a data lake, use Lake Formation jobs to transform the data from all data sources to Apache Parquet format, store the transformed data in an S3 bucket, and use Amazon Athena or RedshiftSpectrum to query the data, would incur more costs and complexity than using Amazon Athena with PartiQL. AWS Lake Formation is a service that helps you centrally govern, secure, and globally share data for analytics and machine learning7. Lake Formation jobs are ETL jobs that you can create and run using the Lake Formation console or API. While using Lake Formation and Parquet can improve the performance and reduce the cost of your queries, they would also increase the complexity and the operational overhead of the data pipeline, as you would have to create, run, and monitor the Lake Formation jobs, and store the transformed data in a separate location in Amazon S3. Moreover, using Lake Formation and Parquet would introduce additional latency, as you would have to wait for the Lake Formation jobs to finish before querying the transformed data. Furthermore, using Redshift Spectrum to query the data would also incur the same costs and complexity as mentioned in option B. References:
? What is Amazon Athena?
? Data Catalog and crawlers in AWS Glue
? AWS Glue Data Catalog
? Columnar Storage Formats
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide
? AWS Glue Schema Registry
? What is AWS Glue?
? Amazon Redshift Serverless
? Amazon Redshift provisioned clusters
? [Querying external data using Amazon Redshift Spectrum]
? [Using stored procedures in Amazon Redshift]
? [What is AWS Lambda?]
? [PartiQL for Amazon Athena]
? [Federated queries in Amazon Athena]
? [Amazon Athena pricing]
? [Top 10 performance tuning tips for Amazon Athena]
? [AWS Glue ETL jobs]
? [AWS Lake Formation jobs]

NEW QUESTION 3
A company stores petabytes of data in thousands of Amazon S3 buckets in the S3 Standard storage class. The data supports analytics workloads that have unpredictable and variable data access patterns.
The company does not access some data for months. However, the company must be able to retrieve all data within milliseconds. The company needs to optimize S3 storage costs.
Which solution will meet these requirements with the LEAST operational overhead?

A. Use S3 Storage Lens standard metrics to determine when to move objects to more cost- optimized storage classe
B. Create S3 Lifecycle policies for the S3 buckets to move objects to cost-optimized storage classe
C. Continue to refine the S3 Lifecycle policies in the future to optimize storage costs.
D. Use S3 Storage Lens activity metrics to identify S3 buckets that the company accesses infrequentl
E. Configure S3 Lifecycle rules to move objects from S3 Standard to the S3 Standard-Infrequent Access (S3 Standard-IA) and S3 Glacier storage classes based on the age of the data.
F. Use S3 Intelligent-Tierin
G. Activate the Deep Archive Access tier.
H. Use S3 Intelligent-Tierin
I. Use the default access tier.

Answer: D

Explanation:
S3 Intelligent-Tiering is a storage class that automatically moves objects between four access tiers based on the changing access patterns. The default access tier consists of two tiers: Frequent Access and Infrequent Access. Objects in the Frequent Access tier have the same performance and availability as S3 Standard, while objects in the Infrequent Access tier have the same performance and availability as S3 Standard-IA. S3 Intelligent-Tiering monitors the access patterns of each object and moves them between the tiers accordingly, without any operational overhead or retrieval fees. This solution can optimize S3 storage costs for data with unpredictable and variable access patterns, while ensuring millisecond latency for data retrieval. The other solutions are not optimal or relevant for this requirement. Using S3 Storage Lens standard metrics and activity metrics can provide insights into the storage usage and access patterns, but they do not automate the data movement between storage classes. Creating S3 Lifecycle policies for the S3 buckets can move objects to more cost-optimized storage classes, but they require manual configuration and maintenance, and they may incur retrieval fees for data that is accessed unexpectedly. Activating the Deep Archive Access tier for S3 Intelligent-Tiering can further reduce the storage costs for data that is rarely accessed, but it also increases the retrieval time to 12 hours, which does not meet the requirement of millisecond latency. References:
? S3 Intelligent-Tiering
? S3 Storage Lens
? S3 Lifecycle policies
? [AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide]

NEW QUESTION 4
A data engineer is configuring Amazon SageMaker Studio to use AWS Glue interactive sessions to prepare data for machine learning (ML) models.
The data engineer receives an access denied error when the data engineer tries to prepare the data by using SageMaker Studio.
Which change should the engineer make to gain access to SageMaker Studio?

A. Add the AWSGlueServiceRole managed policy to the data engineer's IAM user.
B. Add a policy to the data engineer's IAM user that includes the sts:AssumeRole action for the AWS Glue and SageMaker service principals in the trust policy.

C. Add the AmazonSageMakerFullAccess managed policy to the data engineer's IAM user.
D. Add a policy to the data engineer's IAM user that allows the sts:AddAssociation action for the AWS Glue and SageMaker service principals in the trust policy.

Answer: B

Explanation:
This solution meets the requirement of gaining access to SageMaker Studio to use AWS Glue interactive sessions. AWS Glue interactive sessions are a way to use AWS Glue DataBrew and AWS Glue Data Catalog from within SageMaker Studio. To use AWS Glue interactive sessions, the data engineer's IAM user needs to have permissions to assume the AWS Glue service role and the SageMaker execution role. By adding a policy to the data engineer's IAM user that includes the sts:AssumeRole action for the AWS Glue and SageMaker service principals in the trust policy, the data engineer can grant these permissions and avoid the access denied error. The other options are not sufficient or necessary to resolve the error. References:
? Get started with data integration from Amazon S3 to Amazon Redshift using AWS Glue interactive sessions
? Troubleshoot Errors - Amazon SageMaker
? AccessDeniedException on sagemaker:CreateDomain in AWS SageMaker Studio, despite having SageMakerFullAccess

NEW QUESTION 5
A company's data engineer needs to optimize the performance of table SQL queries. The company stores data in an Amazon Redshift cluster. The data engineer cannot increase the size of the cluster because of budget constraints.
The company stores the data in multiple tables and loads the data by using the EVEN distribution style. Some tables are hundreds of gigabytes in size. Other tables are less than 10 MB in size.
Which solution will meet these requirements?

A. Keep using the EVEN distribution style for all table
B. Specify primary and foreign keys for all tables.
C. Use the ALL distribution style for large table
D. Specify primary and foreign keys for all tables.
E. Use the ALL distribution style for rarely updated small table
F. Specify primary and foreign keys for all tables.
G. Specify a combination of distribution, sort, and partition keys for all tables.

Answer: C

Explanation:
This solution meets the requirements of optimizing the performance of table SQL queries without increasing the size of the cluster. By using the ALL distribution style for rarely updated small tables, you can ensure that the entire table is copied to every node in the cluster, which eliminates the need for data redistribution during joins. This can improve query performance significantly, especially for frequently joined dimension tables. However, using the ALL distribution style also increases the storage space and the load time, so it is only suitable for small tables that are not updated frequently orextensively. By specifying primary and foreign keys for all tables, you can help the query optimizer to generate better query plans and avoid unnecessary scans or joins. You can also use the AUTO distribution style to let Amazon Redshift choose the optimal distribution style based on the table size and the query patterns. References:
? Choose the best distribution style
? Distribution styles
? Working with data distribution styles

NEW QUESTION 6
A data engineer must manage the ingestion of real-time streaming data into AWS. The data engineer wants to perform real-time analytics on the incoming streaming data by using time-based aggregations over a window of up to 30 minutes. The data engineer needs a solution that is highly fault tolerant.
Which solution will meet these requirements with the LEAST operational overhead?

A. Use an AWS Lambda function that includes both the business and the analytics logic to perform time-based aggregations over a window of up to 30 minutes for the data in Amazon Kinesis Data Streams.
B. Use Amazon Managed Service for Apache Flink (previously known as Amazon Kinesis Data Analytics) to analyze the data that might occasionally contain duplicates by using multiple types of aggregations.
C. Use an AWS Lambda function that includes both the business and the analytics logic to perform aggregations for a tumbling window of up to 30 minutes, based on the event timestamp.
D. Use Amazon Managed Service for Apache Flink (previously known as Amazon Kinesis Data Analytics) to analyze the data by using multiple types of aggregations to perform time- based analytics over a window of up to 30 minutes.

Answer: A

Explanation:
This solution meets the requirements of managing the ingestion of real-time streaming data into AWS and performing real-time analytics on the incoming streaming data with the least operational overhead. Amazon Managed Service for Apache Flink is a fully managed service that allows you to run Apache Flink applications without having to manage any infrastructure or clusters. Apache Flink is a framework for stateful stream processing that supports various types of aggregations, such as tumbling, sliding, and session windows, over streaming data. By using Amazon Managed Service for Apache Flink, you can easily connect to Amazon Kinesis Data Streams as the source and sink of your streaming data, and perform time-based analytics over a window of up to 30 minutes. This solution is also highly fault tolerant, as Amazon Managed Service for Apache Flink automatically scales, monitors, and restarts your Flink applications in case of failures. References:
? Amazon Managed Service for Apache Flink
? Apache Flink
? Window Aggregations in Flink

NEW QUESTION 7
A company uses Amazon S3 to store semi-structured data in a transactional data lake. Some of the data files are small, but other data files are tens of terabytes.
A data engineer must perform a change data capture (CDC) operation to identify changed data from the data source. The data source sends a full snapshot as a JSON file every day and ingests the changed data into the data lake.
Which solution will capture the changed data MOST cost-effectively?

A. Create an AWS Lambda function to identify the changes between the previous data and the current dat
B. Configure the Lambda function to ingest the changes into the data lake.
C. Ingest the data into Amazon RDS for MySQ

D. Use AWS Database Migration Service (AWS DMS) to write the changed data to the data lake.
E. Use an open source data lake format to merge the data source with the S3 data lake to insert the new data and update the existing data.
F. Ingest the data into an Amazon Aurora MySQL DB instance that runs Aurora Serverles
G. Use AWS Database Migration Service (AWS DMS) to write the changed data to the data lake.

Answer: C

Explanation:
An open source data lake format, such as Apache Parquet, Apache ORC, or Delta Lake, is a cost-effective way to perform a change data capture (CDC) operation on semi-structured data stored in Amazon S3. An open source data lake format allows you to query data directly from S3 using standard SQL, without the need to move or copy data to another service. An open source data lake format also supports schema evolution, meaning it can handle changes in the data structure over time. An open source data lake format also supports upserts, meaning it can insert new data and update existing data in the same operation, using a merge command. This way, you can efficiently capture the changes from the data source and apply them to the S3 data lake, without duplicating or losing any data. The other options are not as cost-effective as using an open source data lake format, as they involve additional steps or costs. Option A requires you to create and maintain an AWS Lambda function, which can be complex and error-prone. AWS Lambda also has some limits on the execution time, memory, and concurrency, which can affect the performance and reliability of the CDC operation. Option B and D require you to ingest the data into a relational database service, such as Amazon RDS or Amazon Aurora, which can be expensive and unnecessary for semi-structured data. AWS Database Migration Service (AWS DMS) can write the changed data to the data lake, but it alsocharges you for the data replication and transfer. Additionally, AWS DMS does not support JSON as a source data type, so you would need to convert the data to a supported format before using AWS DMS. References:
? What is a data lake?
? Choosing a data format for your data lake
? Using the MERGE INTO command in Delta Lake
? [AWS Lambda quotas]
? [AWS Database Migration Service quotas]

NEW QUESTION 8
A company created an extract, transform, and load (ETL) data pipeline in AWS Glue. A data engineer must crawl a table that is in Microsoft SQL Server. The data engineer needs to extract, transform, and load the output of the crawl to an Amazon S3 bucket. The data engineer also must orchestrate the data pipeline.
Which AWS service or feature will meet these requirements MOST cost-effectively?

A. AWS Step Functions
B. AWS Glue workflows
C. AWS Glue Studio
D. Amazon Managed Workflows for Apache Airflow (Amazon MWAA)

Answer: B

Explanation:
AWS Glue workflows are a cost-effective way to orchestrate complex ETL jobs that involve multiple crawlers, jobs, and triggers. AWS Glue workflows allow you to visually monitor the progress and dependencies of your ETL tasks, and automatically handle errors and retries. AWS Glue workflows also integrate with other AWS services, such as Amazon S3, Amazon Redshift, and AWS Lambda, among others, enabling you to leverage these services for your data processing workflows. AWS Glue workflows are serverless, meaning you only pay for the resources you use, and you don't have to manage any infrastructure.
AWS Step Functions, AWS Glue Studio, and Amazon MWAA are also possible options for orchestrating ETL pipelines, but they have some drawbacks compared to AWS Glue workflows. AWS Step Functions is a serverless function orchestrator that can handle different types of data processing, such as real-time, batch, and stream processing. However, AWS Step Functions requires you to write code to define your state machines, which can be complex and error-prone. AWS Step Functions also charges you for every state transition, which can add up quickly for large-scale ETL pipelines.
AWS Glue Studio is a graphical interface that allows you to create and run AWS Glue ETL jobs without writing code. AWS Glue Studio simplifies the process of building, debugging, and monitoring your ETL jobs, and provides a range of pre-built transformations and connectors. However, AWS Glue Studio does not support workflows, meaning you cannot orchestrate multiple ETL jobs or crawlers with dependencies and triggers. AWS Glue Studio also does not support streaming data sources or targets, which limits its use cases for real-time data processing.
Amazon MWAA is a fully managed service that makes it easy to run open-source versions of Apache Airflow on AWS and build workflows to run your ETL jobs and data pipelines. Amazon MWAA provides a familiar and flexible environment for data engineers who are familiar with Apache Airflow, and integrates with a range of AWS services such as Amazon EMR, AWS Glue, and AWS Step Functions. However, Amazon MWAA is not serverless, meaning you have to provision and pay for the resources you need, regardless of your usage. Amazon MWAA also requires you to write code to define your DAGs, which can be challenging and time-consuming for complex ETL pipelines. References:
? AWS Glue Workflows
? AWS Step Functions
? AWS Glue Studio
? Amazon MWAA
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide

NEW QUESTION 9
A company receives .csv files that contain physical address data. The data is in columns that have the following names: Door_No, Street_Name, City, and Zip_Code. The company wants to create a single column to store these values in the following format:

```
{
    "Door_No": "24",
    "Street_Name": "AAA street",
    "City": "BBB",
    "Zip_Code": "111111"
}
```

Which solution will meet this requirement with the LEAST coding effort?

A. Use AWS Glue DataBrew to read the file
B. Use the NEST TO ARRAY transformation to create the new column.
C. Use AWS Glue DataBrew to read the file

D. Use the NEST TO MAP transformation to create the new column.
E. Use AWS Glue DataBrew to read the file
F. Use the PIVOT transformation to create the new column.
G. Write a Lambda function in Python to read the file
H. Use the Python data dictionary type to create the new column.

Answer: B

Explanation:
The NEST TO MAP transformation allows you to combine multiple columns into a single column that contains a JSON object with key-value pairs. This is the easiest way to achieve the desired format for the physical address data, as you can simply select the columns to nest and specify the keys for each column. The NEST TO ARRAY transformation creates a single column that contains an array of values, which is not thesame as the JSON object format. The PIVOT transformation reshapes the data by creating new columns from unique values in a selected column, which is not applicable for this use case. Writing a Lambda function in Python requires more coding effort than using AWS Glue DataBrew, which provides a visual and interactive interface for data transformations.
References:
? 7 most common data preparation transformations in AWS Glue DataBrew (Section: Nesting and unnesting columns)
? NEST TO MAP - AWS Glue DataBrew (Section: Syntax)

NEW QUESTION 10
A data engineer is building a data pipeline on AWS by using AWS Glue extract, transform, and load (ETL) jobs. The data engineer needs to process data from Amazon RDS and MongoDB, perform transformations, and load the transformed data into Amazon Redshift for analytics. The data updates must occur every hour.
Which combination of tasks will meet these requirements with the LEAST operational overhead? (Choose two.)

A. Configure AWS Glue triggers to run the ETL jobs even/ hour.
B. Use AWS Glue DataBrewto clean and prepare the data for analytics.
C. Use AWS Lambda functions to schedule and run the ETL jobs even/ hour.
D. Use AWS Glue connections to establish connectivity between the data sources and Amazon Redshift.
E. Use the Redshift Data API to load transformed data into Amazon Redshift.

Answer: AD

Explanation:
The correct answer is to configure AWS Glue triggers to run the ETL jobs every hour and use AWS Glue connections to establish connectivity between the data sources and Amazon Redshift. AWS Glue triggers are a way to schedule and orchestrate ETL jobs with the least operational overhead. AWS Glue connections are a way to securely connect to data sources and targets using JDBC or MongoDB drivers. AWS Glue DataBrew is a visual data preparation tool that does not support MongoDB as a data source. AWS Lambda functions are a serverless option to schedule and run ETL jobs, but they have a limit of 15 minutes for execution time, which may not be enough for complex transformations. The Redshift Data API is a way to run SQL commands on Amazon Redshift clusters without needing a persistent connection, but it does not support loading data from AWS Glue ETL jobs. References:
? AWS Glue triggers
? AWS Glue connections
? AWS Glue DataBrew
? [AWS Lambda functions]
? [Redshift Data API]

NEW QUESTION 10
A manufacturing company wants to collect data from sensors. A data engineer needs to implement a solution that ingests sensor data in near real time.
The solution must store the data to a persistent data store. The solution must store the data in nested JSON format. The company must have the ability to query from the data store with a latency of less than 10 milliseconds.
Which solution will meet these requirements with the LEAST operational overhead?

A. Use a self-hosted Apache Kafka cluster to capture the sensor dat
B. Store the data in Amazon S3 for querying.
C. Use AWS Lambda to process the sensor dat
D. Store the data in Amazon S3 for querying.
E. Use Amazon Kinesis Data Streams to capture the sensor dat
F. Store the data in Amazon DynamoDB for querying.
G. Use Amazon Simple Queue Service(Amazon SQS) to buffer incomingsensor dat
H. Use AWS Glue to store thedata in Amazon RDS for querying.

Answer: C

Explanation:
Amazon Kinesis Data Streams is a service that enables you to collect, process, and analyze streaming data in real time. You can use Kinesis Data Streams to capture sensor data from various sources, such as IoT devices, web applications, or mobile apps. You can create data streams that can scale up to handle any amount of data from thousands of producers. You can also use the Kinesis Client Library (KCL) or the Kinesis Data Streams API to write applications that process and analyze the data in the streams1. Amazon DynamoDB is a fully managed NoSQL database service that provides fast and predictable performance with seamless scalability. You can use DynamoDB to store the sensor data in nested JSON format, as DynamoDB supports document data types, such as lists and maps. You can also use DynamoDB to query the data with a latency of less than 10 milliseconds, as DynamoDB offers single-digit millisecond performance for any scale of data. You can use the DynamoDB API or the AWS SDKs to perform queries on the data, such as using key-value lookups, scans, or queries2.
The solution that meets the requirements with the least operational overhead is to use Amazon Kinesis Data Streams to capture the sensor data and store the data in Amazon DynamoDB for querying. This solution has the following advantages:
? It does not require you to provision, manage, or scale any servers, clusters, or queues, as Kinesis Data Streams and DynamoDB are fully managed services that handle all the infrastructure for you. This reduces the operational complexity and cost of running your solution.
? It allows you to ingest sensor data in near real time, as Kinesis Data Streams can capture data records as they are produced and deliver them to your applications within seconds. You can also use Kinesis Data Firehose to load the data from the streams to DynamoDB automatically and continuously3.
? It allows you to store the data in nested JSON format, as DynamoDB supports document data types, such as lists and maps. You can also use DynamoDB Streams to capturechanges in the data and trigger actions, such as sending notifications or updating other databases.
? It allows you to query the data with a latency of less than 10 milliseconds, as DynamoDB offers single-digit millisecond performance for any scale of data. You can also use DynamoDB Accelerator (DAX) to improve the read performance by caching frequently accessed data.
Option A is incorrect because it suggests using a self-hosted Apache Kafka cluster to capture the sensor data and store the data in Amazon S3 for querying. This solution has the following disadvantages:

? It requires you to provision, manage, and scale your own Kafka cluster, either on EC2 instances or on-premises servers. This increases the operational complexity and cost of running your solution.
? It does not allow you to query the data with a latency of less than 10 milliseconds, as Amazon S3 is an object storage service that is not optimized for low-latency queries. You need to use another service, such as Amazon Athena or Amazon Redshift Spectrum, to query the data in S3, which may incur additional costs and latency.
Option B is incorrect because it suggests using AWS Lambda to process the sensor data and store the data in Amazon S3 for querying. This solution has the following disadvantages:
? It does not allow you to ingest sensor data in near real time, as Lambda is a serverless compute service that runs code in response to events. You need to use another service, such as API Gateway or Kinesis Data Streams, to trigger Lambda functions with sensor data, which may add extra latency and complexity to your solution.
? It does not allow you to query the data with a latency of less than 10 milliseconds, as Amazon S3 is an object storage service that is not optimized for low-latency queries. You need to use another service, such as Amazon Athena or Amazon Redshift Spectrum, to query the data in S3, which may incur additional costs and latency.
Option D is incorrect because it suggests using Amazon Simple Queue Service (Amazon SQS) to buffer incoming sensor data and use AWS Glue to store the data in Amazon RDS for querying. This solution has the following disadvantages:
? It does not allow you to ingest sensor data in near real time, as Amazon SQS is a message queue service that delivers messages in a best-effort manner. You need to use another service, such as Lambda or EC2, to poll the messages from the queue and process them, which may add extra latency and complexity to your solution.
? It does not allow you to store the data in nested JSON format, as Amazon RDS is a relational database service that supports structured data types, such as tables and columns. You need to use another service, such as AWS Glue, to transform the data from JSON to relational format, which may add extra cost and overhead to your solution.
References:
? 1: Amazon Kinesis Data Streams - Features
? 2: Amazon DynamoDB - Features
? 3: Loading Streaming Data into Amazon DynamoDB - Amazon Kinesis Data Firehose
? [4]: Capturing Table Activity with DynamoDB Streams - Amazon DynamoDB
? [5]: Amazon DynamoDB Accelerator (DAX) - Features
? [6]: Amazon S3 - Features
? [7]: AWS Lambda - Features
? [8]: Amazon Simple Queue Service - Features
? [9]: Amazon Relational Database Service - Features
? [10]: Working with JSON in Amazon RDS - Amazon Relational Database Service
? [11]: AWS Glue - Features

NEW QUESTION 14
A company uses Amazon Athena to run SQL queries for extract, transform, and load (ETL) tasks by using Create Table As Select (CTAS). The company must use Apache Spark instead of SQL to generate analytics.
Which solution will give the company the ability to use Spark to access Athena?

A. Athena query settings
B. Athena workgroup
C. Athena data source
D. Athena query editor

Answer: C

Explanation:
Athena data source is a solution that allows you to use Spark to access Athena by using the Athena JDBC driver and the Spark SQL interface. You can use the Athena data source to create Spark DataFrames from Athena tables, run SQL queries on the DataFrames, and write the results back to Athena. The Athena data source supports various data formats, such as CSV, JSON, ORC, and Parquet, and also supports partitioned and bucketed tables. The Athena data source is a cost-effective and scalable way to use Spark to access Athena, as it does not require any additional infrastructure or services, and you only pay for the data scanned by Athena.
The other options are not solutions that give the company the ability to use Spark to access Athena. Option A, Athena query settings, is a feature that allows you to configure various parameters for your Athena queries, such as the output location, the encryption settings, the query timeout, and the workgroup. Option B, Athena workgroup, is a feature that allows you to isolate and manage your Athena queries and resources, such as the query history, the query notifications, the query concurrency, and the query cost. Option D, Athena query editor, is a feature that allows you to write and run SQL queries on Athena using the web console or the API. None of these options enable you to use Spark instead of SQL to generate analytics on Athena. References:
? Using Apache Spark in Amazon Athena
? Athena JDBC Driver
? Spark SQL
? Athena query settings
? [Athena workgroups]
? [Athena query editor]

NEW QUESTION 16
A data engineer must use AWS services to ingest a dataset into an Amazon S3 data lake. The data engineer profiles the dataset and discovers that the dataset contains personally identifiable information (PII). The data engineer must implement a solution to profile the dataset and obfuscate the PII.
Which solution will meet this requirement with the LEAST operational effort?

A. Use an Amazon Kinesis Data Firehose delivery stream to process the datase
B. Create an AWS Lambda transform function to identify the PI
C. Use an AWS SDK to obfuscate the PI
D. Set the S3 data lake as the target for the delivery stream.
E. Use the Detect PII transform in AWS Glue Studio to identify the PI
F. Obfuscate the PI
G. Use an AWS Step Functions state machine to orchestrate a data pipeline to ingest the data into the S3 data lake.
H. Use the Detect PII transform in AWS Glue Studio to identify the PI
I. Create a rule in AWS Glue Data Quality to obfuscate the PI
J. Use an AWS Step Functions state machine to orchestrate a data pipeline to ingest the data into the S3 data lake.
K. Ingest the dataset into Amazon DynamoD
L. Create an AWS Lambda function to identify and obfuscate the PII in the DynamoDB table and to transform the dat

M. Use the same Lambda function to ingest the data into the S3 data lake.

Answer: C

Explanation:
AWS Glue is a fully managed service that provides a serverless data integration platform for data preparation, data cataloging, and data loading. AWS Glue Studio is a graphical interface that allows you to easily author, run, and monitor AWS Glue ETL jobs. AWS Glue Data Quality is a feature that enables you to validate, cleanse, and enrich your data using predefined or custom rules. AWS Step Functions is a service that allows you to coordinate multiple AWS services into serverless workflows.
Using the Detect PII transform in AWS Glue Studio, you can automatically identify and label the PII in your dataset, such as names, addresses, phone numbers, email addresses, etc. You can then create a rule in AWS Glue Data Quality to obfuscate the PII, such as masking, hashing, or replacing the values with dummy data. You can also use other rules to validate and cleanse your data, such as checking for null values, duplicates, outliers, etc. You can then use an AWS Step Functions state machine to orchestrate a data pipeline to ingest the data into the S3 data lake. You can use AWS Glue DataBrew to visually explore and transform the data, AWS Glue crawlers to discover and catalog the data, and AWS Glue jobs to load the data into the S3 data lake.
This solution will meet the requirement with the least operational effort, as it leverages the serverless and managed capabilities of AWS Glue, AWS Glue Studio, AWS Glue Data Quality, and AWS Step Functions. You do not need to write any code to identify or obfuscate the PII, as you can use the built-in transforms and rules in AWS Glue Studio and AWS Glue Data Quality. You also do not need to provision or manage any servers or clusters, as AWS Glue and AWS Step Functions scale automatically based on the demand. The other options are not as efficient as using the Detect PII transform in AWS Glue Studio, creating a rule in AWS Glue Data Quality, and using an AWS Step Functions state machine. Using an Amazon Kinesis Data Firehose delivery stream to process the dataset, creating an AWS Lambda transform function to identify the PII, using an AWS SDK to obfuscate the PII, and setting the S3 data lake as the target for the delivery stream will require more operational effort, as you will need to write and maintain code to identifyand obfuscate the PII, as well as manage the Lambda function and its resources. Using the Detect PII transform in AWS Glue Studio to identify the PII, obfuscating the PII, and using an AWS Step Functions state machine to orchestrate a data pipeline to ingest the data into the S3 data lake will not be as effective as creating a rule in AWS Glue Data Quality to obfuscate the PII, as you will need to manually obfuscate the PII after identifying it, which can be error-prone and time-consuming. Ingesting the dataset into Amazon DynamoDB, creating an AWS Lambda function to identify and obfuscate the PII in the DynamoDB table and to transform the data, and using the same Lambda function to ingest the data into the S3 data lake will require more operational effort, as you will need to write and maintain code to identify and obfuscate the PII, as well as manage the Lambda function and its resources. You will also incur additional costs and complexity by using DynamoDB as an intermediate data store, which may not be necessary for your use case. References:
? AWS Glue
? AWS Glue Studio
? AWS Glue Data Quality
? [AWS Step Functions]
? [AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide], Chapter 6: Data Integration and Transformation, Section 6.1: AWS Glue

NEW QUESTION 21
A financial services company stores financial data in Amazon Redshift. A data engineer wants to run real-time queries on the financial data to support a web-based trading application. The data engineer wants to run the queries from within the trading application.
Which solution will meet these requirements with the LEAST operational overhead?

A. Establish WebSocket connections to Amazon Redshift.
B. Use the Amazon Redshift Data API.
C. Set up Java Database Connectivity (JDBC) connections to Amazon Redshift.
D. Store frequently accessed data in Amazon S3. Use Amazon S3 Select to run the queries.

Answer: B

Explanation:
The Amazon Redshift Data API is a built-in feature that allows you to run SQL queries on Amazon Redshift data with web services-based applications, such as AWS Lambda, Amazon SageMaker notebooks, and AWS Cloud9. The Data API does not require a persistent connection to your database, and it provides a secure HTTP endpoint and integration with AWS SDKs. You can use the endpoint to run SQL statements without managing connections. The Data API also supports both Amazon Redshift provisioned clusters and Redshift Serverless workgroups. The Data API is the best solution for running real-time queries on the financial data from within the trading application, as it has the least operational overhead compared to the other options.
Option A is not the best solution, as establishing WebSocket connections to Amazon Redshift would require more configuration and maintenance than using the Data API. WebSocket connections are also not supported by Amazon Redshift clusters or serverless workgroups.
Option C is not the best solution, as setting up JDBC connections to Amazon Redshift would also require more configuration and maintenance than using the Data API. JDBC connections are also not supported by Redshift Serverless workgroups.
Option D is not the best solution, as storing frequently accessed data in Amazon S3 and using Amazon S3 Select to run the queries would introduce additional latency and complexity than using the Data API. Amazon S3 Select is also not optimized for real-time queries, as it scans the entire object before returning the results. References:
? Using the Amazon Redshift Data API
? Calling the Data API
? Amazon Redshift Data API Reference
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide

NEW QUESTION 25
A company uses Amazon Redshift for its data warehouse. The company must automate refresh schedules for Amazon Redshift materialized views.
Which solution will meet this requirement with the LEAST effort?

A. Use Apache Airflow to refresh the materialized views.
B. Use an AWS Lambda user-defined function (UDF) within Amazon Redshift to refresh the materialized views.
C. Use the query editor v2 in Amazon Redshift to refresh the materialized views.
D. Use an AWS Glue workflow to refresh the materialized views.

Answer: C

Explanation:
The query editor v2 in Amazon Redshift is a web-based tool that allows users to run SQL queries and scripts on Amazon Redshift clusters. The query editor v2 supports creating and managing materialized views, which are precomputed results of a query that can improve the performance of subsequent queries. The query editor v2 also supports scheduling queries to run at specified intervals, which can be used to refresh materialized views automatically. This solution requires the least effort, as it does not involve any additional services, coding, or configuration. The other solutions are more complex and require more operational overhead. Apache Airflow is an open-source platform for orchestrating workflows, which can be used to refresh materialized views, but it requires setting up and managing an

Airflow environment, creating DAGs (directed acyclic graphs) to define the workflows, and integrating with Amazon Redshift. AWS Lambda is a serverless compute service that can run code in response to events, which can be used to refresh materialized views, but it requires creating and deploying Lambda functions, defining UDFs within Amazon Redshift, and triggering the functions using events or schedules. AWS Glue is a fully managed ETL service that can run jobs to transform and load data, which can be used to refresh materialized views, but it requires creating and configuring Glue jobs, defining Glue workflows to orchestrate the jobs, and scheduling the workflows using triggers. References:
? Query editor V2
? Working with materialized views
? Scheduling queries
? [AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide]

NEW QUESTION 27
A data engineer needs to build an extract, transform, and load (ETL) job. The ETL job will process daily incoming .csv files that users upload to an Amazon S3 bucket. The size of each S3 object is less than 100 MB.
Which solution will meet these requirements MOST cost-effectively?

A. Write a custom Python applicatio
B. Host the application on an Amazon Elastic Kubernetes Service (Amazon EKS) cluster.
C. Write a PySpark ETL scrip
D. Host the script on an Amazon EMR cluster.
E. Write an AWS Glue PySpark jo
F. Use Apache Spark to transform the data.
G. Write an AWS Glue Python shell jo
H. Use pandas to transform the data.

Answer: D

Explanation:
AWS Glue is a fully managed serverless ETL service that can handle various data sources and formats, including .csv files in Amazon S3. AWS Glue provides two types of jobs: PySpark and Python shell. PySpark jobs use Apache Spark to process large-scale data in parallel, while Python shell jobs use Python scripts to process small-scale data in a single execution environment. For this requirement, a Python shell job is more suitable and cost-effective, as the size of each S3 object is less than 100 MB, which does not require distributed processing. A Python shell job can use pandas, a popular Python library fordata analysis, to transform the .csv data as needed. The other solutions are not optimal or relevant for this requirement. Writing a custom Python application and hosting it on an Amazon EKS cluster would require more effort and resources to set up and manage the Kubernetes environment, as well as to handle the data ingestion and transformation logic. Writing a PySpark ETL script and hosting it on an Amazon EMR cluster would also incur more costs and complexity to provision and configure the EMR cluster, as well as to use Apache Spark for processing small data files. Writing an AWS Glue PySpark job would also be less efficient and economical than a Python shell job, as it would involve unnecessary overhead and charges for using Apache Spark for small data files. References:
? AWS Glue
? Working with Python Shell Jobs
? pandas
? [AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide]

NEW QUESTION 31
A data engineer needs to create an AWS Lambda function that converts the format of data from .csv to Apache Parquet. The Lambda function must run only if a user uploads a .csv file to an Amazon S3 bucket.
Which solution will meet these requirements with the LEAST operational overhead?

A. Create an S3 event notification that has an event type of s3:ObjectCreated:*. Use a filter rule to generate notifications only when the suffix includes .cs
B. Set the Amazon Resource Name (ARN) of the Lambda function as the destination for the event notification.
C. Create an S3 event notification that has an event type of s3:ObjectTagging:* for objects that have a tag set to .cs
D. Set the Amazon Resource Name (ARN) of the Lambda function as the destination for the event notification.
E. Create an S3 event notification that has an event type of s3:*. Use a filter rule to generate notifications only when the suffix includes .cs
F. Set the Amazon Resource Name (ARN) of the Lambda function as the destination for the event notification.
G. Create an S3 event notification that has an event type of s3:ObjectCreated:*. Use a filter rule to generate notifications only when the suffix includes .cs
H. Set an Amazon Simple Notification Service (Amazon SNS) topic as the destination for the event notificatio
I. Subscribe the Lambda function to the SNS topic.

Answer: A

Explanation:
Option A is the correct answer because it meets the requirements with the least operational overhead. Creating an S3 event notification that has an event type of s3:ObjectCreated:* will trigger the Lambda function whenever a new object is created in the S3 bucket. Using a filter rule to generate notifications only when the suffix includes .csv will ensure that the Lambda function only runs for .csv files. Setting the ARN of the Lambda function as the destination for the event notification will directly invoke the Lambda function without any additional steps.
Option B is incorrect because it requires the user to tag the objects with .csv, which adds an extra step and increases the operational overhead.
Option C is incorrect because it uses an event type of s3:*, which will trigger the Lambda function for any S3 event, not just object creation. This could result in unnecessary invocations and increased costs.
Option D is incorrect because it involves creating and subscribing to an SNS topic, which adds an extra layer of complexity and operational overhead.
References:
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide, Chapter 3: Data Ingestion and Transformation, Section 3.2: S3 Event Notifications and Lambda Functions, Pages 67-69
? Building Batch Data Analytics Solutions on AWS, Module 4: Data Transformation, Lesson 4.2: AWS Lambda, Pages 4-8
? AWS Documentation Overview, AWS Lambda Developer Guide, Working with AWS Lambda Functions, Configuring Function Triggers, Using AWS Lambda with Amazon S3, Pages 1-5

NEW QUESTION 35
A company receives a daily file that contains customer data in .xls format. The company stores the file in Amazon S3. The daily file is approximately 2 GB in size.
A data engineer concatenates the column in the file that contains customer first names and the column that contains customer last names. The data engineer needs to determine the number of distinct customers in the file.
Which solution will meet this requirement with the LEAST operational effort?

A. Create and run an Apache Spark job in an AWS Glue noteboo
B. Configure the job to read the S3 file and calculate the number of distinct customers.
C. Create an AWS Glue crawler to create an AWS Glue Data Catalog of the S3 fil
D. Run SQL queries from Amazon Athena to calculate the number of distinct customers.
E. Create and run an Apache Spark job in Amazon EMR Serverless to calculate the number of distinct customers.
F. Use AWS Glue DataBrew to create a recipe that uses the COUNT_DISTINCT aggregate function to calculate the number of distinct customers.

Answer: D

Explanation:
AWS Glue DataBrew is a visual data preparation tool that allows you to clean, normalize, and transform data without writing code. You can use DataBrew to create recipes that define the steps to apply to your data, such as filtering, renaming, splitting, or aggregating columns. You can also use DataBrew to run jobs that execute the recipes on your data sources, such as Amazon S3, Amazon Redshift, or Amazon Aurora. DataBrew integrates with AWS Glue Data Catalog, which is a centralized metadata repository for your data assets1.
The solution that meets the requirement with the least operational effort is to use AWS Glue DataBrew to create a recipe that uses the COUNT_DISTINCT aggregate function to calculate the number of distinct customers. This solution has the following advantages:
? It does not require you to write any code, as DataBrew provides a graphical user
interface that lets you explore, transform, and visualize your data. You can use DataBrewto concatenate the columns that contain customer first names and last names, and then use the COUNT_DISTINCT aggregate function to count the number of unique values in the resulting column2.
? It does not require you to provision, manage, or scale any servers, clusters, or notebooks, as DataBrew is a fully managed service that handles all the infrastructure for you. DataBrew can automatically scale up or down the compute resources based on the size and complexity of your data and recipes1.
? It does not require you to create or update any AWS Glue Data Catalog entries, as
DataBrew can automatically create and register the data sources and targets in the Data Catalog. DataBrew can also use the existing Data Catalog entries to access the data in S3 or other sources3.
Option A is incorrect because it suggests creating and running an Apache Spark job in an AWS Glue notebook. This solution has the following disadvantages:
? It requires you to write code, as AWS Glue notebooks are interactive development environments that allow you to write, test, and debug Apache Spark code using Python or Scala. You need to use the Spark SQL or the Spark DataFrame API to read the S3 file and calculate the number of distinct customers.
? It requires you to provision and manage a development endpoint, which is a serverless Apache Spark environment that you can connect to your notebook. You need to specify the type and number of workers for your development endpoint, and monitor its status and metrics.
? It requires you to create or update the AWS Glue Data Catalog entries for the S3 file, either manually or using a crawler. You need to use the Data Catalog as a metadata store for your Spark job, and specify the database and table names in your code.
Option B is incorrect because it suggests creating an AWS Glue crawler to create an AWS Glue Data Catalog of the S3 file, and running SQL queries from Amazon Athena to calculate the number of distinct customers. This solution has the following disadvantages:
? It requires you to create and run a crawler, which is a program that connects to your data store, progresses through a prioritized list of classifiers to determine the schema for your data, and then creates metadata tables in the Data Catalog. You need to specify the data store, the IAM role, the schedule, and the output database for your crawler.
? It requires you to write SQL queries, as Amazon Athena is a serverless interactive query service that allows you to analyze data in S3 using standard SQL. You need to use Athena to concatenate the columns that contain customer first names and last names, and then use the COUNT(DISTINCT) aggregate function to count the number of unique values in the resulting column.
Option C is incorrect because it suggests creating and running an Apache Spark job in Amazon EMR Serverless to calculate the number of distinct customers. This solution has the following disadvantages:
? It requires you to write code, as Amazon EMR Serverless is a service that allows you to run Apache Spark jobs on AWS without provisioning or managing any infrastructure. You need to use the Spark SQL or the Spark DataFrame API to read the S3 file and calculate the number of distinct customers.
? It requires you to create and manage an Amazon EMR Serverless cluster, which is a fully managed and scalable Spark environment that runs on AWS Fargate. You need to specify the cluster name, the IAM role, the VPC, and the subnet for your cluster, and monitor its status and metrics.
? It requires you to create or update the AWS Glue Data Catalog entries for the S3 file, either manually or using a crawler. You need to use the Data Catalog as a metadata store for your Spark job, and specify the database and table names in your code.
References:
? 1: AWS Glue DataBrew - Features
? 2: Working with recipes - AWS Glue DataBrew
? 3: Working with data sources and data targets - AWS Glue DataBrew
? [4]: AWS Glue notebooks - AWS Glue
? [5]: Development endpoints - AWS Glue
? [6]: Populating the AWS Glue Data Catalog - AWS Glue
? [7]: Crawlers - AWS Glue
? [8]: Amazon Athena - Features
? [9]: Amazon EMR Serverless - Features
? [10]: Creating an Amazon EMR Serverless cluster - Amazon EMR
? [11]: Using the AWS Glue Data Catalog with Amazon EMR Serverless - Amazon EMR

NEW QUESTION 36
A company has used an Amazon Redshift table that is named Orders for 6 months. The company performs weekly updates and deletes on the table. The table has an interleaved sort key on a column that contains AWS Regions.
The company wants to reclaim disk space so that the company will not run out of storage space. The company also wants to analyze the sort key column.
Which Amazon Redshift command will meet these requirements?

A. VACUUM FULL Orders
B. VACUUM DELETE ONLY Orders
C. VACUUM REINDEX Orders
D. VACUUM SORT ONLY Orders

Answer: C

Explanation:
Amazon Redshift is a fully managed, petabyte-scale data warehouse service that enables fast and cost-effective analysis of large volumes of data. Amazon Redshift uses columnar storage, compression, and zone maps to optimize the storage and performance of data. However, over time, as data is inserted, updated, or deleted, the physical storage of data can become fragmented, resulting in wasted disk space and degraded query performance. To address this issue, Amazon Redshift provides the VACUUM command, which reclaims disk space and resorts rows in either a specified table or all tables in the current schema1.
The VACUUM command has four options: FULL, DELETE ONLY, SORT ONLY, and REINDEX. The option that best meets the requirements of the question is VACUUM REINDEX, which re-sorts the rows in a table that has an interleaved sort key and rewritesthe table to a new location on disk. An interleaved sort key is a type of sort key that gives equal weight to each column in the sort key, and stores the rows in a way that optimizes the performance of queries that filter by multiple columns in the sort key. However, as data is added or changed, the interleaved sort order can become skewed, resulting in suboptimal query performance. The

VACUUM REINDEX option restores the optimal interleaved sort order and reclaims disk space by removing deleted rows. This option also analyzes the sort key column and updates the table statistics, which are used by the query optimizer to generate the most efficient query execution plan23.
The other options are not optimal for the following reasons:
? A. VACUUM FULL Orders. This option reclaims disk space by removing deleted rows and resorts the entire table. However, this option is not suitable for tables that have an interleaved sort key, as it does not restore the optimal interleaved sort order. Moreover, this option is the most resource-intensive and time-consuming, as it rewrites the entire table to a new location on disk.
? B. VACUUM DELETE ONLY Orders. This option reclaims disk space by removing deleted rows, but does not resort the table. This option is not suitable for tables that have any sort key, as it does not improve the query performance by restoring the sort order. Moreover, this option does not analyze the sort key column and update the table statistics.
? D. VACUUM SORT ONLY Orders. This option resorts the entire table, but does not reclaim disk space by removing deleted rows. This option is not suitable for tables that have an interleaved sort key, as it does not restore the optimal interleaved sort order. Moreover, this option does not analyze the sort key column and update the table statistics.
References:
? 1: Amazon Redshift VACUUM
? 2: Amazon Redshift Interleaved Sorting
? 3: Amazon Redshift ANALYZE

NEW QUESTION 37
A company uses an on-premises Microsoft SQL Server database to store financial transaction data. The company migrates the transaction data from the on-premises database to AWS at the end of each month. The company has noticed that the cost to migrate data from the on-premises database to an Amazon RDS for SQL Server database has increased recently.
The company requires a cost-effective solution to migrate the data to AWS. The solution must cause minimal downtown for the applications that access the database.
Which AWS service should the company use to meet these requirements?

A. AWS Lambda
B. AWS Database Migration Service (AWS DMS)
C. AWS Direct Connect
D. AWS DataSync

Answer: B

Explanation:
AWS Database Migration Service (AWS DMS) is a cloud service that makes it possible to migrate relational databases, data warehouses, NoSQL databases, and other types of data stores to AWS quickly, securely, and with minimal downtime and zero data loss1. AWS DMS supports migration between 20-plus database and analytics engines, such as Microsoft SQL Server to Amazon RDS for SQL Server2. AWS DMS takes overmany of the difficult or tedious tasks involved in a migration project, such as capacity analysis, hardware and software procurement, installation and administration, testing and debugging, and ongoing replication and monitoring1. AWS DMS is a cost-effective solution, as you only pay for the compute resources and additional log storage used during the migration process2. AWS DMS is the best solution for the company to migrate the financial transaction data from the on-premises Microsoft SQL Server database to AWS, as it meets the requirements of minimal downtime, zero data loss, and low cost.
Option A is not the best solution, as AWS Lambda is a serverless compute service that lets you run code without provisioning or managing servers, but it does not provide any built-in features for database migration. You would have to write your own code to extract, transform, and load the data from the source to the target, which would increase the operational overhead and complexity.
Option C is not the best solution, as AWS Direct Connect is a service that establishes a dedicated network connection from your premises to AWS, but it does not provide any built-in features for database migration. You would still need to use another service or tool to perform the actual data transfer, which would increase the cost and complexity.
Option D is not the best solution, as AWS DataSync is a service that makes it easy to transfer data between on-premises storage systems and AWS storage services, such as Amazon S3, Amazon EFS, and Amazon FSx for Windows File Server, but it does not support Amazon RDS for SQL Server as a target. You would have to use another service or tool to migrate the data from Amazon S3 to Amazon RDS for SQL Server, which would increase the latency and complexity.
References:
? Database Migration - AWS Database Migration Service - AWS
? What is AWS Database Migration Service?
? AWS Database Migration Service Documentation
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide

NEW QUESTION 42
An airline company is collecting metrics about flight activities for analytics. The company is conducting a proof of concept (POC) test to show how analytics can provide insights that the company can use to increase on-time departures.
The POC test uses objects in Amazon S3 that contain the metrics in .csv format. The POC test uses Amazon Athena to query the data. The data is partitioned in the S3 bucket by date.
As the amount of data increases, the company wants to optimize the storage solution to improve query performance.
Which combination of solutions will meet these requirements? (Choose two.)

A. Add a randomized string to the beginning of the keys in Amazon S3 to get more throughput across partitions.
B. Use an S3 bucket that is in the same account that uses Athena to query the data.
C. Use an S3 bucket that is in the same AWS Region where the company runs Athena queries.
D. Preprocess the .csvdata to JSON format by fetchingonly the document keys that the query requires.
E. Preprocess the .csv data to Apache Parquet format by fetching only the data blocks that are needed for predicates.

Answer: CE

Explanation:
Using an S3 bucket that is in the same AWS Region where the company runs Athena queries can improve query performance by reducing data transfer latency and costs. Preprocessing the .csv data to Apache Parquet format can also improve query performance by enabling columnar storage, compression, and partitioning, which can reduce the amount of data scanned and fetched by the query. These solutions can optimize the storage solution for the POC test without requiring much effort or changes to the existing data pipeline. The other solutions are not optimal or relevant for this requirement. Adding a randomized string to the beginning of the keys in Amazon S3 can improve the throughput across partitions, but it can also make the data harder to query and manage. Using an S3 bucket that is in the same account that uses Athena to query the data does not have any significant impact on query performance, as long as the proper permissions are granted. Preprocessing the .csv data to JSON format does not offer any benefits over the .csv format, as both are row-based and verbose formats that require more data scanning and fetching than columnar formats like Parquet. References:
? Best Practices When Using Athena with AWS Glue

? Optimizing Amazon S3 Performance
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide

NEW QUESTION 47
A data engineer uses Amazon Redshift to run resource-intensive analytics processes once every month. Every month, the data engineer creates a new Redshift provisioned cluster. The data engineer deletes the Redshift provisioned cluster after the analytics processes are complete every month. Before the data engineer deletes the cluster each month, the data engineer unloads backup data from the cluster to an Amazon S3 bucket.
The data engineer needs a solution to run the monthly analytics processes that does not require the data engineer to manage the infrastructure manually.
Which solution will meet these requirements with the LEAST operational overhead?

A. Use Amazon Step Functions to pause the Redshift cluster when the analytics processes are complete and to resume the cluster to run new processes every month.
B. Use Amazon Redshift Serverless to automatically process the analytics workload.
C. Use the AWS CLI to automatically process the analytics workload.
D. Use AWS CloudFormation templates to automatically process the analytics workload.

Answer: B

Explanation:
Amazon Redshift Serverless is a new feature of Amazon Redshift that enables you to run SQL queries on data in Amazon S3 without provisioning or managing any clusters. You can use Amazon Redshift Serverless to automatically process the analytics workload, as it scales up and down the compute resources based on the query demand, and charges you only for the resources consumed. This solution will meet the requirements with the least operational overhead, as it does not require the data engineer to create, delete, pause, or resume any Redshift clusters, or to manage any infrastructure manually. You can use the Amazon Redshift Data API to run queries from the AWS CLI, AWS SDK, or AWS Lambda functions12.
The other options are not optimal for the following reasons:
? A. Use Amazon Step Functions to pause the Redshift cluster when the analytics processes are complete and to resume the cluster to run new processes every month. This option is not recommended, as it would still require the data engineer to create and delete a new Redshift provisioned cluster every month, which can incur additional costs and time. Moreover, this option would require the data engineer to use Amazon Step Functions to orchestrate the workflow of pausing and resuming the cluster, which can add complexity and overhead.
? C. Use the AWS CLI to automatically process the analytics workload. This option is vague and does not specify how the AWS CLI is used to process the analytics workload. The AWS CLI can be used to run queries on data in Amazon S3 using Amazon Redshift Serverless, Amazon Athena, or Amazon EMR, but each of these services has different features and benefits. Moreover, this option does not address the requirement of not managing the infrastructure manually, as the data engineer may still need to provision and configure some resources, such as Amazon EMR clusters or Amazon Athena workgroups.
? D. Use AWS CloudFormation templates to automatically process the analytics workload. This option is also vague and does not specify how AWS CloudFormation templates are used to process the analytics workload. AWS CloudFormation is a service that lets you model and provision AWS resources using templates. You can use AWS CloudFormation templates to create and delete a Redshift provisioned cluster every month, or to create and configure other AWS resources, such as Amazon EMR, Amazon Athena, or Amazon Redshift Serverless. However, this option does not address the requirement of not managing the infrastructure manually, as the data engineer may still need to write and maintain the AWS CloudFormation templates, and to monitor the status and performance of the resources.
References:
? 1: Amazon Redshift Serverless
? 2: Amazon Redshift Data API
? : Amazon Step Functions
? : AWS CLI
? : AWS CloudFormation

NEW QUESTION 48
A data engineer must ingest a source of structured data that is in .csv format into an Amazon S3 data lake. The .csv files contain 15 columns. Data analysts need to run Amazon Athena queries on one or two columns of the dataset. The data analysts rarely query the entire file.
Which solution will meet these requirements MOST cost-effectively?

A. Use an AWS Glue PySpark job to ingest the source data into the data lake in .csv format.
B. Create an AWS Glue extract, transform, and load (ETL) job to read from the .csv structured data sourc
C. Configure the job to ingest the data into the data lake in JSON format.
D. Use an AWS Glue PySpark job to ingest the source data into the data lake in Apache Avro format.
E. Create an AWS Glue extract, transform, and load (ETL) job to read from the .csv structured data sourc
F. Configure the job to write the data into the data lake in Apache Parquet format.

Answer: D

Explanation:
Amazon Athena is a serverless interactive query service that allows you to analyze data in Amazon S3 using standard SQL. Athena supports various data formats, such as CSV,JSON, ORC, Avro, and Parquet. However, not all data formats are equally efficient for querying. Some data formats, such as CSV and JSON, are row-oriented, meaning that they store data as a sequence of records, each with the same fields. Row- oriented formats are suitable for loading and exporting data, but they are not optimal for analytical queries that often access only a subset of columns. Row-oriented formats also do not support compression or encoding techniques that can reduce the data size and improve the query performance.
On the other hand, some data formats, such as ORC and Parquet, are column-oriented, meaning that they store data as a collection of columns, each with a specific data type. Column-oriented formats are ideal for analytical queries that often filter, aggregate, or join data by columns. Column-oriented formats also support compression and encoding techniques that can reduce the data size and improve the query performance. For example, Parquet supports dictionary encoding, which replaces repeated values with numeric codes, and run-length encoding, which replaces consecutive identical values with a single value and a count. Parquet also supports various compression algorithms, such as Snappy, GZIP, and ZSTD, that can further reduce the data size and improve the query performance.
Therefore, creating an AWS Glue extract, transform, and load (ETL) job to read from the .csv structured data source and writing the data into the data lake in Apache Parquet format will meet the requirements most cost-effectively. AWS Glue is a fully managed service that provides a serverless data integration platform for data preparation, data cataloging, and data loading. AWS Glue ETL jobs allow you to transform and load data from various sources into various targets, using either a graphical interface (AWS Glue Studio) or a code-based interface (AWS Glue console or AWS Glue API). By using AWS Glue ETL jobs, you can easily convert the data from CSV to Parquet format, without having to write or manage any code. Parquet is a column-oriented format that allows Athena to scan only the relevant columns and skip the rest, reducing the amount of data read from S3. This solution will also reduce the cost of Athena queries, as Athena charges based on the amount of data scanned from S3.
The other options are not as cost-effective as creating an AWS Glue ETL job to write the data into the data lake in Parquet format. Using an AWS Glue PySpark job to ingest the source data into the data lake in .csv format will not improve the query performance or reduce the query cost, as .csv is a row-oriented format that

does not support columnar access or compression. Creating an AWS Glue ETL job to ingest the data into the data lake in JSON format will not improve the query performance or reduce the query cost, as JSON is also a row-oriented format that does not support columnar access or compression. Using an AWS Glue PySpark job to ingest the source data into the data lake in Apache Avro format will improve the query performance, as Avro is a column-oriented format that supports compression and encoding, but it will require more operational effort, as you will need to write and maintain PySpark code to convert the data from CSV to Avro format. References:
? Amazon Athena
? Choosing the Right Data Format
? AWS Glue
? [AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide], Chapter 5: Data Analysis and Visualization, Section 5.1: Amazon Athena

NEW QUESTION 49
A company is developing an application that runs on Amazon EC2 instances. Currently, the data that the application generates is temporary. However, the company needs to persist the data, even if the EC2 instances are terminated.
A data engineer must launch new EC2 instances from an Amazon Machine Image (AMI) and configure the instances to preserve the data.
Which solution will meet this requirement?

A. Launch new EC2 instances by using an AMI that is backed by an EC2 instance store volume that contains the application dat
B. Apply the default settings to the EC2 instances.
C. Launch new EC2 instances by using an AMI that is backed by a root Amazon Elastic Block Store (Amazon EBS) volume that contains the application dat
D. Apply the default settings to the EC2 instances.
E. Launch new EC2 instances by using an AMI that is backed by an EC2 instance store volum
F. Attach an Amazon Elastic Block Store (Amazon EBS) volume to contain the application dat
G. Apply the default settings to the EC2 instances.
H. Launch new EC2 instances by using an AMI that is backed by an Amazon Elastic Block Store (Amazon EBS) volum
I. Attach an additional EC2 instance store volume to contain the application dat
J. Apply the default settings to the EC2 instances.

Answer: C

Explanation:
Amazon EC2 instances can use two types of storage volumes: instance store volumes and Amazon EBS volumes. Instance store volumes are ephemeral, meaning they are only attached to the instance for the duration of its life cycle. If the instance is stopped, terminated, or fails, the data on the instance store volume is lost. Amazon EBS volumes are persistent, meaning they can be detached from the instance and attached to another instance, and the data on the volume is preserved. To meet the requirement of persisting the data even if the EC2 instances are terminated, the data engineer must use Amazon EBS volumes to store the application data. The solution is to launch new EC2 instances by using an AMI that is backed by an EC2 instance store volume, which is the default option for most AMIs. Then, the data engineer must attach an Amazon EBS volume to each instance and configure the application to write the data to the EBS volume. This way, the data will be saved on the EBS volume and can be accessed by another instance if needed. The data engineer can apply the default settings to the EC2 instances, as there is no need to modify the instance type, security group, or IAM role for this solution. The other options are either not feasible or not optimal. Launching new EC2 instances by using an AMI that is backed by an EC2 instance store volume that contains the application data (option A) or by using an AMI that is backed by a root Amazon EBS volume that contains the application data (option B) would not work, as the data on the AMI would be outdated and overwritten by the new instances. Attaching an additional EC2 instance store volume to contain the application data (option D)would not work, as the data on the instance store volume would be lost if the instance is terminated. References:
? Amazon EC2 Instance Store
? Amazon EBS Volumes
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide, Chapter 2: Data Store Management, Section 2.1: Amazon EC2

NEW QUESTION 50
A company uses an Amazon Redshift provisioned cluster as its database. The Redshift cluster has five reserved ra3.4xlarge nodes and uses key distribution.
A data engineer notices that one of the nodes frequently has a CPU load over 90%. SQL Queries that run on the node are queued. The other four nodes usually have a CPU load under 15% during daily operations.
The data engineer wants to maintain the current number of compute nodes. The data engineer also wants to balance the load more evenly across all five compute nodes.
Which solution will meet these requirements?

A. Change the sort key to be the data column that is most often used in a WHERE clause of the SQL SELECT statement.
B. Change the distribution key to the table column that has the largest dimension.
C. Upgrade the reserved node from ra3.4xlarqe to ra3.16xlarqe.
D. Change the primary key to be the data column that is most often used in a WHERE clause of the SQL SELECT statement.

Answer: B

Explanation:
Changing the distribution key to the table column that has the largest dimension will help to balance the load more evenly across all five compute nodes. The distribution key determines how the rows of a table are distributed among the slices of the cluster. If the distribution key is not chosen wisely, it can cause data skew, meaning some slices will have more data than others, resulting in uneven CPU load and query performance. By choosing the table column that has the largest dimension, meaning the column that has the most distinct values, as the distribution key, the data engineer can ensure that the rows are distributed more uniformly across the slices, reducing data skew and improving query performance.
The other options are not solutions that will meet the requirements. Option A, changing the sort key to be the data column that is most often used in a WHERE clause of the SQL SELECT statement, will not affect the data distribution or the CPU load. The sort key determines the order in which the rows of a table are stored on disk, which can improve the performance of range-restricted queries, but not the load balancing. Option C, upgrading the reserved node from ra3.4xlarge to ra3.16xlarge, will not maintain the current number of compute nodes, as it will increase the cost and the capacity of the cluster. Option D, changing the primary key to be the data column that is most often used in a WHERE clause of the SQL SELECT statement, will not affect the data distribution or the CPU load either. The primary key is a constraint that enforces the uniqueness of the rows in a table, but it does not influence the data layout or the query optimization. References:
? Choosing a data distribution style
? Choosing a data sort key
? Working with primary keys

NEW QUESTION 52
A company needs to build a data lake in AWS. The company must provide row-level data access and column-level data access to specific teams. The teams will access the data by using Amazon Athena, Amazon Redshift Spectrum, and Apache Hive from Amazon EMR.

Which solution will meet these requirements with the LEAST operational overhead?

A. Use Amazon S3 for data lake storag
B. Use S3 access policies to restrict data access by rows and column
C. Provide data access throughAmazon S3.
D. Use Amazon S3 for data lake storag
E. Use Apache Ranger through Amazon EMR to restrict data access byrows and column
F. Providedata access by using Apache Pig.
G. Use Amazon Redshift for data lake storag
H. Use Redshift security policies to restrict data access byrows and column
I. Provide data accessby usingApache Spark and Amazon Athena federated queries.
J. UseAmazon S3 for data lake storag
K. Use AWS Lake Formation to restrict data access by rows and column
L. Provide data access through AWS Lake Formation.

Answer: D

Explanation:
Option D is the best solution to meet the requirements with the least operational overhead because AWS Lake Formation is a fully managed service that simplifies the process of building, securing, and managing data lakes. AWS Lake Formation allows you to define granular data access policies at the row and column level for different users and groups. AWS Lake Formation also integrates with Amazon Athena, Amazon Redshift Spectrum, and Apache Hive on Amazon EMR, enabling these services to access the data in the data lake through AWS Lake Formation.
Option A is not a good solution because S3 access policies cannot restrict data access by rows and columns. S3 access policies are based on the identity and permissions of the requester, the bucket and object ownership, and the object prefix and tags. S3 access policies cannot enforce fine-grained data access control at the row and column level. Option B is not a good solution because it involves using Apache Ranger and Apache Pig, which are not fully managed services and require additional configuration and maintenance. Apache Ranger is a framework that provides centralized security administration for data stored in Hadoop clusters, such as Amazon EMR. Apache Ranger can enforce row-level and column-level access policies for Apache Hive tables. However, Apache Ranger is not a native AWS service and requires manual installation and configuration on Amazon EMR clusters. Apache Pig is a platform that allows you to analyze large data sets using a high-level scripting language called Pig Latin. Apache Pig can access data stored in Amazon S3 and process it using Apache Hive. However,Apache Pig is not a native AWS service and requires manual installation and configuration on Amazon EMR clusters.
Option C is not a good solution because Amazon Redshift is not a suitable service for data lake storage. Amazon Redshift is a fully managed data warehouse service that allows you to run complex analytical queries using standard SQL. Amazon Redshift can enforce row- level and column-level access policies for different users and groups. However, Amazon Redshift is not designed to store and process large volumes of unstructured or semi- structured data, which are typical characteristics of data lakes. Amazon Redshift is also more expensive and less scalable than Amazon S3 for data lake storage.
References:
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide
? What Is AWS Lake Formation? - AWS Lake Formation
? Using AWS Lake Formation with Amazon Athena - AWS Lake Formation
? Using AWS Lake Formation with Amazon Redshift Spectrum - AWS Lake Formation
? Using AWS Lake Formation with Apache Hive on Amazon EMR - AWS Lake Formation
? Using Bucket Policies and User Policies - Amazon Simple Storage Service
? Apache Ranger
? Apache Pig
? What Is Amazon Redshift? - Amazon Redshift

NEW QUESTION 56
A healthcare company uses Amazon Kinesis Data Streams to stream real-time health data from wearable devices, hospital equipment, and patient records.
A data engineer needs to find a solution to process the streaming data. The data engineer needs to store the data in an Amazon Redshift Serverless warehouse.
The solution must support near real-time analytics of the streaming data and the previous day's data. Which solution will meet these requirements with the LEAST operational overhead?

A. Load data into Amazon Kinesis Data Firehos
B. Load the data into Amazon Redshift.
C. Use the streaming ingestion feature of Amazon Redshift.
D. Load the data into Amazon S3. Use the COPY command to load the data into Amazon Redshift.
E. Use the Amazon Aurora zero-ETL integration with Amazon Redshift.

Answer: B

Explanation:
The streaming ingestion feature of Amazon Redshift enables you to ingest data from streaming sources, such as Amazon Kinesis Data Streams, into Amazon Redshift tables in near real-time. You can use the streaming ingestion feature to process the streaming data from the wearable devices, hospital equipment, and patient records. The streaming ingestion feature also supports incremental updates, which means you can append new data or update existing data in the Amazon Redshift tables. This way, you can store the data in an Amazon Redshift Serverless warehouse and support near real-time analytics of the streaming data and the previous day's data. This solution meets the requirements with the least operational overhead, as it does not require any additional services or components to ingest and process the streaming data. The other options are either not feasible or not optimal. Loading data into Amazon Kinesis Data Firehose and then into Amazon Redshift (option A) would introduce additional latency and cost, as well as require additional configuration and management. Loading data into Amazon S3 and then using the COPY command to load the data into Amazon Redshift (option C) would also introduce additional latency and cost, as well as require additional storage space and ETL logic. Using the Amazon Aurora zero-ETL integration with Amazon Redshift (option D) would not work, as it requires the data to be stored in Amazon Aurora first, which is not the case for the streaming data from the healthcare company. References:
? Using streaming ingestion with Amazon Redshift
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide, Chapter 3: Data Ingestion and Transformation, Section 3.5: Amazon Redshift Streaming Ingestion

NEW QUESTION 57
A company has five offices in different AWS Regions. Each office has its own human resources (HR) department that uses a unique IAM role. The company stores employee records in a data lake that is based on Amazon S3 storage.
A data engineering team needs to limit access to the records. Each HR department should be able to access records for only employees who are within the HR department's Region.
Which combination of steps should the data engineering team take to meet this requirement with the LEAST operational overhead? (Choose two.)

A. Use data filters for each Region to register the S3 paths as data locations.
B. Register the S3 path as an AWS Lake Formation location.
C. Modify the IAM roles of the HR departments to add a data filter for each department's Region.
D. Enable fine-grained access control in AWS Lake Formatio
E. Add a data filter for each Region.
F. Create a separate S3 bucket for each Regio
G. Configure an IAM policy to allow S3 acces
H. Restrict access based on Region.

Answer: BD

Explanation:
AWS Lake Formation is a service that helps you build, secure, and manage data lakes on Amazon S3. You can use AWS Lake Formation to register the S3 path as a data lake location, and enable fine-grained access control to limit access to the records based on the HR department's Region. You can use data filters to specify which S3 prefixes or partitions each HR department can access, and grant permissions to the IAM roles of the HR departments accordingly. This solution will meet the requirement with the least operational overhead, as it simplifies the data lake management and security, and leverages the existing IAM roles of the HR departments12.
The other options are not optimal for the following reasons:
? A. Use data filters for each Region to register the S3 paths as data locations. This option is not possible, as data filters are not used to register S3 paths as data locations, but to grant permissions to access specific S3 prefixes or partitions within a data location. Moreover, this option does not specify how to limit access to the records based on the HR department's Region.
? C. Modify the IAM roles of the HR departments to add a data filter for each department's Region. This option is not possible, as data filters are not added to IAM roles, but to permissions granted by AWS Lake Formation. Moreover, this option does not specify how to register the S3 path as a data lake location, or how to enable fine-grained access control in AWS Lake Formation.
? E. Create a separate S3 bucket for each Region. Configure an IAM policy to allow S3 access. Restrict access based on Region. This option is not recommended, as it would require more operational overhead to create and manage multiple S3 buckets, and to configure and maintain IAM policies for each HR department. Moreover, this option does not leverage the benefits of AWS Lake Formation, such as data cataloging, data transformation, and data governance.
References:
? 1: AWS Lake Formation
? 2: AWS Lake Formation Permissions
? : AWS Identity and Access Management
? : Amazon S3

NEW QUESTION 58
A company uses Amazon RDS to store transactional data. The company runs an RDS DB instance in a private subnet. A developer wrote an AWS Lambda function with default settings to insert, update, or delete data in the DB instance.
The developer needs to give the Lambda function the ability to connect to the DB instance privately without using the public internet.
Which combination of steps will meet this requirement with the LEAST operational overhead? (Choose two.)

A. Turn on the public access setting for the DB instance.
B. Update the security group of the DB instance to allow only Lambda function invocations on the database port.
C. Configure the Lambda function to run in the same subnet that the DB instance uses.
D. Attach the same security group to the Lambda function and the DB instanc
E. Include a self-referencing rule that allows access through the database port.
F. Update the network ACL of the private subnet to include a self-referencing rule that allows access through the database port.

Answer: CD

Explanation:
To enable the Lambda function to connect to the RDS DB instance privately without using the public internet, the best combination of steps is to configure the Lambda function to run in the same subnet that the DB instance uses, and attach the same security group to the Lambda function and the DB instance. This way, the Lambda function and the DB instance can communicate within the same private network, and the security group can allow traffic between them on the database port. This solution has the least operational overhead, as it does not require any changes to the public access setting, the network ACL, or the security group of the DB instance.
The other options are not optimal for the following reasons:
? A. Turn on the public access setting for the DB instance. This option is not recommended, as it would expose the DB instance to the public internet, which can compromise the security and privacy of the data. Moreover, this option would not enable the Lambda function to connect to the DB instance privately, as it would still require the Lambda function to use the public internet to access the DB instance.
? B. Update the security group of the DB instance to allow only Lambda function invocations on the database port. This option is not sufficient, as it would only modify the inbound rules of the security group of the DB instance, but not the outbound rules of the security group of the Lambda function. Moreover, this option would not enable the Lambda function to connect to the DB instance privately, as it would still require the Lambda function to use the public internet to access the DB instance.
? E. Update the network ACL of the private subnet to include a self-referencing rule
that allows access through the database port. This option is not necessary, as the network ACL of the private subnet already allows all traffic within the subnet by default. Moreover, this option would not enable the Lambda function to connect to the DB instance privately, as it would still require the Lambda function to use the public internet to access the DB instance.
References:
? 1: Connecting to an Amazon RDS DB instance
? 2: Configuring a Lambda function to access resources in a VPC
? 3: Working with security groups
? : Network ACLs

NEW QUESTION 63
A company has multiple applications that use datasets that are stored in an Amazon S3 bucket. The company has an ecommerce application that generates a dataset that contains personally identifiable information (PII). The company has an internal analytics application that does not require access to the PII.
To comply with regulations, the company must not share PII unnecessarily. A data engineer needs to implement a solution that with redact PII dynamically, based on the needs of each application that accesses the dataset.
Which solution will meet the requirements with the LEAST operational overhead?

A. Create an S3 bucket policy to limit the access each application ha
B. Create multiple copies of the datase

C. Give each dataset copy the appropriate level of redaction for the needs of the application that accesses the copy.
D. Create an S3 Object Lambda endpoin
E. Use the S3 Object Lambda endpoint to read data from the S3 bucke
F. Implement redaction logic within an S3 Object Lambda function to dynamically redact PII based on the needs of each application that accesses the data.
G. Use AWS Glue to transform the data for each applicatio
H. Create multiple copies of the datase
I. Give each dataset copy the appropriate level of redaction for the needs of the application that accesses the copy.
J. Create an API Gateway endpoint that has custom authorizer
K. Use the API Gateway endpoint to read data from the S3 bucke
L. Initiate a REST API call to dynamically redact PII based on the needs of each application that accesses the data.

Answer: B

Explanation:
Option B is the best solution to meet the requirements with the least operational overhead because S3 Object Lambda is a feature that allows you to add your own code to process data retrieved from S3 before returning it to an application. S3 Object Lambda works with S3 GET requests and can modify both the object metadata and the object data. By using S3 Object Lambda, you can implement redaction logic within an S3 Object Lambda function to dynamically redact PII based on the needs of each application that accesses the data. This way, you can avoid creating and maintaining multiple copies of the dataset with different levels of redaction.
Option A is not a good solution because it involves creating and managing multiple copies of the dataset with different levels of redaction for each application. This option adds complexity and storage cost to the data protection process and requires additional resources and configuration. Moreover, S3 bucket policies cannot enforce fine-grained data access control at the row and column level, so they are not sufficient to redact PII.
Option C is not a good solution because it involves using AWS Glue to transform the data for each application. AWS Glue is a fully managed service that can extract, transform, and load (ETL) data from various sources to various destinations, including S3. AWS Glue can also convert data to different formats, such as Parquet, which is a columnar storage format that is optimized for analytics. However, in this scenario, using AWS Glue to redact PII is not the best option because it requires creating and maintaining multiple copies of the dataset with different levels of redaction for each application. This option also adds extra time and cost to the data protection process and requires additional resources and configuration.
Option D is not a good solution because it involves creating and configuring an API Gateway endpoint that has custom authorizers. API Gateway is a service that allows youto create, publish, maintain, monitor, and secure APIs at any scale. API Gateway can also integrate with other AWS services, such as Lambda, to provide custom logic for processing requests. However, in this scenario, using API Gateway to redact PII is not the best option because it requires writing and maintaining custom code and configuration for the API endpoint, the custom authorizers, and the REST API call. This option also adds complexity and latency to the data protection process and requires additional resources and configuration.
References:
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide
? Introducing Amazon S3 Object Lambda – Use Your Code to Process Data as It Is Being Retrieved from S3
? Using Bucket Policies and User Policies - Amazon Simple Storage Service
? AWS Glue Documentation
? What is Amazon API Gateway? - Amazon API Gateway

NEW QUESTION 68
A data engineer runs Amazon Athena queries on data that is in an Amazon S3 bucket. The Athena queries use AWS Glue Data Catalog as a metadata table.
The data engineer notices that the Athena query plans are experiencing a performance bottleneck. The data engineer determines that the cause of the performance bottleneck is the large number of partitions that are in the S3 bucket. The data engineer must resolve the performance bottleneck and reduce Athena query planning time.
Which solutions will meet these requirements? (Choose two.)

A. Create an AWS Glue partition inde
B. Enable partition filtering.
C. Bucketthe data based on a column thatthe data have in common in a WHERE clause of the user query
D. Use Athena partition projection based on the S3 bucket prefix.
E. Transform the data that is in the S3 bucket to Apache Parquet format.
F. Use the Amazon EMR S3DistCP utility to combine smaller objects in the S3 bucket into larger objects.

Answer: AC

Explanation:
The best solutions to resolve the performance bottleneck and reduce Athena query planning time are to create an AWS Glue partition index and enable partition filtering, and to use Athena partition projection based on the S3 bucket prefix.
AWS Glue partition indexes are a feature that allows you to speed up query processing of highly partitioned tables cataloged in AWS Glue Data Catalog. Partition indexes are available for queries in Amazon EMR, Amazon Redshift Spectrum, and AWS Glue ETL jobs. Partition indexes are sublists of partition keys defined in the table. When you create a partition index, you specify a list of partition keys that already exist on a given table. AWS Glue then creates an index for the specified keys and stores it in the Data Catalog. When you run a query that filters on the partition keys, AWS Glue uses the partition index to quickly identify the relevant partitions without scanning the entiretable metadata. This reduces the query planning time and improves the query performance1.
Athena partition projection is a feature that allows you to speed up query processing of highly partitioned tables and automate partition management. In partition projection, Athena calculates partition values and locations using the table properties that you configure directly on your table in AWS Glue. The table properties allow Athena to 'project', or determine, the necessary partition information instead of having to do a more time- consuming metadata lookup in the AWS Glue Data Catalog. Because in-memory operations are often faster than remote operations, partition projection can reduce the runtime of queries against highly partitioned tables. Partition projection also automates partition management because it removes the need to manually create partitions in Athena, AWS Glue, or your external Hive metastore2.
Option B is not the best solution, as bucketing the data based on a column that the data have in common in a WHERE clause of the user query would not reduce the query planning time. Bucketing is a technique that divides data into buckets based on a hash function applied to a column. Bucketing can improve the performance of join queries by
reducing the amount of data that needs to be shuffled between nodes. However, bucketing does not affect the partition metadata retrieval, which is the main cause of the performance bottleneck in this scenario3.
Option D is not the best solution, as transforming the data that is in the S3 bucket to Apache Parquet format would not reduce the query planning time. Apache Parquet is a columnar storage format that can improve the performance of analytical queries by reducing the amount of data that needs to be scanned and providing efficient compression and encoding schemes. However, Parquet does not affect the partition metadata retrieval, which is the main cause of the performance bottleneck in this scenario4.
Option E is not the best solution, as using the Amazon EMR S3DistCP utility to combine smaller objects in the S3 bucket into larger objects would not reduce the query planning time. S3DistCP is a tool that can copy large amounts of data between Amazon S3 buckets or from HDFS to Amazon S3. S3DistCP can also aggregate smaller files into larger files to improve the performance of sequential access. However, S3DistCP does not affect the partition metadata retrieval, which is the main cause of the performance bottleneck in this scenario5. References:

? Improve query performance using AWS Glue partition indexes
? Partition projection with Amazon Athena
? Bucketing vs Partitioning
? Columnar Storage Formats
? S3DistCp
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide

NEW QUESTION 72
A data engineer is using Amazon Athena to analyze sales data that is in Amazon S3. The data engineer writes a query to retrieve sales amounts for 2023 for several products from a table named sales_data. However, the query does not return results for all of the products that are in the sales_data table. The data engineer needs to troubleshoot the query to resolve the issue.
The data engineer's original query is as follows: SELECT product_name, sum(sales_amount) FROM sales_data
WHERE year = 2023
GROUP BY product_name
How should the data engineer modify the Athena query to meet these requirements?

A. Replace sum(sales amount) with count(*J for the aggregation.
B. Change WHERE year = 2023 to WHERE extractlyear FROM sales data) = 2023.
C. Add HAVING sumfsales amount) > 0 after the GROUP BY clause.
D. Remove the GROUP BY clause

Answer: B

Explanation:
The original query does not return results for all of the products because the year column in the sales_data table is not an integer, but a timestamp. Therefore, the WHERE clause does not filter the data correctly, and only returns the products that have a null value for the year column. To fix this, the data engineer should use the extract function to extract the year from the timestamp and compare it with 2023. This way, the querywill return the correct results for all of the products in the sales_data table. The other options are either incorrect or irrelevant, as they do not address the root cause of the issue. Replacing sum with count does not change the filtering condition, adding HAVING clause does not affect the grouping logic, and removing the GROUP BY clause does not solve the problem of missing products. References:
? Troubleshooting JSON queries - Amazon Athena (Section: JSON related errors)
? When I query a table in Amazon Athena, the TIMESTAMP result is empty (Section: Resolution)
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide (Chapter 7, page 197)

NEW QUESTION 76
A data engineer has a one-time task to read data from objects that are in Apache Parquet format in an Amazon S3 bucket. The data engineer needs to query only one column of the data.
Which solution will meet these requirements with the LEAST operational overhead?

A. Confiqure an AWS Lambda function to load data from the S3 bucket into a pandas dataframe- Write a SQL SELECT statement on the dataframe to query the required column.
B. Use S3 Select to write a SQL SELECT statement to retrieve the required column from the S3 objects.
C. Prepare an AWS Glue DataBrew project to consume the S3 objects and to query the required column.
D. Run an AWS Glue crawler on the S3 object
E. Use a SQL SELECT statement in Amazon Athena to query the required column.

Answer: B

Explanation:
Option B is the best solution to meet the requirements with the least operational overhead because S3 Select is a feature that allows you to retrieve only a subset of data from an S3 object by using simple SQL expressions. S3 Select works on objects stored in CSV, JSON, or Parquet format. By using S3 Select, you can avoid the need to download and process the entire S3 object, which reduces the amount of data transferred and the computation time. S3 Select is also easy to use and does not require any additional services or resources.
Option A is not a good solution because it involves writing custom code and configuring an AWS Lambda function to load data from the S3 bucket into a pandas dataframe and query the required column. This option adds complexity and latency to the data retrieval process and requires additional resources and configuration.Moreover, AWS Lambda has limitations on the execution time, memory, and concurrency, which may affect the performance and reliability of the data retrieval process.
Option C is not a good solution because it involves creating and running an AWS Glue DataBrew project to consume the S3 objects and query the required column. AWS Glue DataBrew is a visual data preparation tool that allows you to clean, normalize, and transform data without writing code. However, in this scenario, the data is already in Parquet format, which is a columnar storage format that is optimized for analytics. Therefore, there is no need to use AWS Glue DataBrew to prepare the data. Moreover, AWS Glue DataBrew adds extra time and cost to the data retrieval process and requires additional resources and configuration.
Option D is not a good solution because it involves running an AWS Glue crawler on the S3 objects and using a SQL SELECT statement in Amazon Athena to query the required column. An AWS Glue crawler is a service that can scan data sources and create metadata tables in the AWS Glue Data Catalog. The Data Catalog is a central repository that stores information about the data sources, such as schema, format, and location. Amazon Athena is a serverless interactive query service that allows you to analyze data in S3 using standard SQL. However, in this scenario, the schema and format of the data are already known and fixed, so there is no need to run a crawler to discover them. Moreover, running a crawler and using Amazon Athena adds extra time and cost to the data retrieval process and requires additional services and configuration.
References:
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide
? S3 Select and Glacier Select - Amazon Simple Storage Service
? AWS Lambda - FAQs
? What Is AWS Glue DataBrew? - AWS Glue DataBrew
? Populating the AWS Glue Data Catalog - AWS Glue
? What is Amazon Athena? - Amazon Athena

NEW QUESTION 79
A company stores details about transactions in an Amazon S3 bucket. The company wants to log all writes to the S3 bucket into another S3 bucket that is in the same AWS Region.
Which solution will meet this requirement with the LEAST operational effort?

A. Configure an S3 Event Notifications rule for all activities on the transactions S3 bucket to invoke an AWS Lambda functio
B. Program the Lambda function to write the event to Amazon Kinesis Data Firehos
C. Configure Kinesis Data Firehose to write the event to the logs S3 bucket.
D. Create a trail of management events in AWS CloudTrai
E. Configure the trail to receive data from the transactions S3 bucke
F. Specify an empty prefix and write-only event
G. Specify the logs S3 bucket as the destination bucket.
H. Configure an S3 Event Notifications rule for all activities on the transactions S3 bucket to invoke an AWS Lambda functio
I. Program the Lambda function to write the events to the logs S3 bucket.
J. Create a trail of data events in AWS CloudTrai
K. Configure the trail to receive data from the transactions S3 bucke
L. Specify an empty prefix and write-only event
M. Specify the logs S3 bucket as the destination bucket.

Answer: D

Explanation:
This solution meets the requirement of logging all writes to the S3 bucket into another S3 bucket with the least operational effort. AWS CloudTrail is a service that records the API calls made to AWS services, including Amazon S3. By creating a trail of data events, you can capture the details of the requests that are made to the transactions S3 bucket, such as the requester, the time, the IP address, and the response elements. By specifying an empty prefix and write-only events, you can filter the data events to only include the ones that write to the bucket. By specifying the logs S3 bucket as the destination bucket, you can store the CloudTrail logs in another S3 bucket that is in the same AWS Region. This solution does not require any additional coding or configuration, and it is more scalable and reliable than using S3 Event Notifications and Lambda functions. References:
? Logging Amazon S3 API calls using AWS CloudTrail
? Creating a trail for data events
? Enabling Amazon S3 server access logging

NEW QUESTION 83
A company wants to implement real-time analytics capabilities. The company wants to use Amazon Kinesis Data Streams and Amazon Redshift to ingest and process streaming data at the rate of several gigabytes per second. The company wants to derive near real-time insights by using existing business intelligence (BI) and analytics tools.
Which solution will meet these requirements with the LEAST operational overhead?

A. Use Kinesis Data Streams to stage data in Amazon S3. Use the COPY command to load data from Amazon S3 directly into Amazon Redshift to make the data immediately available for real-time analysis.
B. Access the data from Kinesis Data Streams by using SQL querie
C. Create materialized views directly on top of the strea
D. Refresh the materialized views regularly to query the most recent stream data.
E. Create an external schema in Amazon Redshift to map the data from Kinesis Data Streams to an Amazon Redshift objec
F. Create a materialized view to read data from the strea
G. Set the materialized view to auto refresh.
H. Connect Kinesis Data Streams to Amazon Kinesis Data Firehos
I. Use Kinesis Data Firehose to stage the data in Amazon S3. Use the COPY command to load the data from Amazon S3 to a table in Amazon Redshift.

Answer: C

Explanation:
This solution meets the requirements of implementing real-time analytics capabilities with the least operational overhead. By creating an external schema in Amazon Redshift, you can access the data from Kinesis Data Streams using SQL queries without having to load the data into the cluster. By creating a materialized view on top of the stream, you can store the results of the query in the cluster and make them available for analysis. By setting the materialized view to auto refresh, you can ensure that the view is updated with the latest data from the stream at regular intervals. This way, you can derive near real-time insights by using existing BI and analytics tools. References:
? Amazon Redshift streaming ingestion
? Creating an external schema for Amazon Kinesis Data Streams
? Creating a materialized view for Amazon Kinesis Data Streams

NEW QUESTION 86
A data engineer needs to securely transfer 5 TB of data from an on-premises data center to an Amazon S3 bucket. Approximately 5% of the data changes every day. Updates to the data need to be regularlyproliferated to the S3 bucket. The data includes files that are in multiple formats. The data engineer needs to automate the transfer process and must schedule the process to run periodically.
Which AWS service should the data engineer use to transfer the data in the MOST operationally efficient way?

A. AWS DataSync
B. AWS Glue
C. AWS Direct Connect
D. Amazon S3 Transfer Acceleration

Answer: A

Explanation:
AWS DataSync is an online data movement and discovery service that simplifies and accelerates data migrations to AWS as well as moving data to and from on-premises storage, edge locations, other cloud providers, and AWS Storage services1. AWS DataSync can copy data to and from various sources and targets, including Amazon S3, and handle files in multiple formats. AWS DataSync also supports incremental transfers, meaning it can detect and copy only the changes to the data, reducing the amount of data transferred and improving the performance. AWS DataSync can automate and schedule the transfer process using triggers, and monitor the progress and status of the transfers using CloudWatch metrics and events1.
AWS DataSync is the most operationally efficient way to transfer the data in this scenario, as it meets all the requirements and offers a serverless and scalable solution. AWS Glue, AWS Direct Connect, and Amazon S3 Transfer Acceleration are not the best options for this scenario, as they have some limitations or drawbacks compared to AWS DataSync. AWS Glue is a serverless ETL service that can extract, transform, and load data from various sources to various targets, including Amazon S32. However, AWS Glue is not designed for large-scale data transfers, as it has some quotas and limits on the number
and size of files it can process3. AWS Glue also does not support incremental transfers, meaning it would have to copy the entire data set every time, which would be inefficient and costly.

AWS Direct Connect is a service that establishes a dedicated network connection between your on-premises data center and AWS, bypassing the public internet and improving the bandwidth and performance of the data transfer. However, AWS Direct Connect is not a data transfer service by itself, as it requires additional services or tools to copy the data, such as AWS DataSync, AWS Storage Gateway, or AWS CLI. AWS Direct Connect also has some hardware and location requirements, and charges you for the port hours and data transfer out of AWS.
Amazon S3 Transfer Acceleration is a feature that enables faster data transfers to Amazon S3 over long distances, using the AWS edge locations and optimized network paths. However, Amazon S3 Transfer Acceleration is not a data transfer service by itself, as it requires additional services or tools to copy the data, such as AWS CLI, AWS SDK, or third-party software. Amazon S3 Transfer Acceleration also charges you for the data transferred over the accelerated endpoints, and does not guarantee a performance improvement for every transfer, as it depends on various factors such as the network conditions, the distance, and the object size. References:
? AWS DataSync
? AWS Glue
? AWS Glue quotas and limits
? [AWS Direct Connect]
? [Data transfer options for AWS Direct Connect]
? [Amazon S3 Transfer Acceleration]
? [Using Amazon S3 Transfer Acceleration]

NEW QUESTION 91
A data engineer is configuring an AWS Glue job to read data from an Amazon S3 bucket. The data engineer has set up the necessary AWS Glue connection details and an associated IAM role. However, when the data engineer attempts to run the AWS Glue job, the data engineer receives an error message that indicates that there are problems with the Amazon S3 VPC gateway endpoint.
The data engineer must resolve the error and connect the AWS Glue job to the S3 bucket. Which solution will meet this requirement?

A. Update the AWS Glue security group to allow inbound traffic from the Amazon S3 VPC gateway endpoint.
B. Configure an S3 bucket policy to explicitly grant the AWS Glue job permissions to access the S3 bucket.
C. Review the AWS Glue job code to ensure that the AWS Glue connection details include a fully qualified domain name.
D. Verify that the VPC's route table includes inbound and outbound routes for the Amazon S3 VPC gateway endpoint.

Answer: D

Explanation:
The error message indicates that the AWS Glue job cannot access the Amazon S3 bucket through the VPC endpoint. This could be because the VPC's route table does not have the necessary routes to direct the traffic to the endpoint. To fix this, the data engineer must verify that the route table has an entry for the Amazon S3 service prefix (com.amazonaws.region.s3) with the target as the VPC endpoint ID. This will allow the AWS Glue job to use the VPC endpoint to access the S3 bucket without going through the internet or a NAT gateway. For more information, see Gateway endpointsR. eferences:
? Troubleshoot the AWS Glue error "VPC S3 endpoint validation failed"
? Amazon VPC endpoints for Amazon S3
? [AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide]

NEW QUESTION 92
A company is planning to use a provisioned Amazon EMR cluster that runs Apache Spark jobs to perform big data analysis. The company requires high reliability. A big data team must follow best practices for running cost-optimized and long-running workloads on Amazon EMR. The team must find a solution that will maintain the company's current level of performance.
Which combination of resources will meet these requirements MOST cost-effectively? (Choose two.)

A. Use Hadoop Distributed File System (HDFS) as a persistent data store.
B. Use Amazon S3 as a persistent data store.
C. Use x86-based instances for core nodes and task nodes.
D. Use Graviton instances for core nodes and task nodes.
E. Use Spot Instances for all primary nodes.

Answer: BD

Explanation:
The best combination of resources to meet the requirements of high reliability, cost-optimization, and performance for running Apache Spark jobs on Amazon EMR is to use Amazon S3 as a persistent data store and Graviton instances for core nodes and task nodes.
Amazon S3 is a highly durable, scalable, and secure object storage service that can store any amount of data for a variety of use cases, including big data analytics1. Amazon S3 is a better choice than HDFS as a persistent data store for Amazon EMR, as it decouples the storage from the compute layer, allowing for more flexibility and cost-efficiency. Amazon S3 also supports data encryption, versioning, lifecycle management, and cross-region replication1. Amazon EMR integrates seamlessly with Amazon S3, using EMR File System (EMRFS) to access data stored in Amazon S3 buckets2. EMRFS also supports consistent view, which enables Amazon EMR to provide read-after-write consistency for Amazon S3 objects that are accessed through EMRFS2.
Graviton instances are powered by Arm-based AWS Graviton2 processors that deliver up to 40% better price performance over comparable current generation x86-based instances3. Graviton instances are ideal for running workloads that are CPU-bound, memory-bound, or network-bound, such as big data analytics, web servers, and open- source databases3. Graviton instances are compatible with Amazon EMR, and can beused for both core nodes and task nodes. Core nodes are responsible for running the data processing frameworks, such as Apache Spark, and storing data in HDFS or the local file system. Task nodes are optional nodes that can be added to a cluster to increase the processing power and throughput. By using Graviton instances for both core nodes and task nodes, you can achieve higher performance and lower cost than using x86-based instances.
Using Spot Instances for all primary nodes is not a good option, as it can compromise the reliability and availability of the cluster. Spot Instances are spare EC2 instances that are available at up to 90% discount compared to On-Demand prices, but they can be interrupted by EC2 with a two-minute notice when EC2 needs the capacity back. Primary nodes are the nodes that run the cluster software, such as Hadoop, Spark, Hive, and Hue, and are essential for the cluster operation. If a primary node is interrupted by EC2, the cluster will fail or become unstable. Therefore, it is recommended to use On-Demand Instances or Reserved Instances for primary nodes, and use Spot Instances only for task nodes that can tolerate interruptions. References:
? Amazon S3 - Cloud Object Storage
? EMR File System (EMRFS)
? AWS Graviton2 Processor-Powered Amazon EC2 Instances
? [Plan and Configure EC2 Instances]
? [Amazon EC2 Spot Instances]
? [Best Practices for Amazon EMR]

NEW QUESTION 96

A data engineer needs to maintain a central metadata repository that users access through Amazon EMR and Amazon Athena queries. The repository needs to provide the schema and properties of many tables. Some of the metadata is stored in Apache Hive. The data engineer needs to import the metadata from Hive into the central metadata repository.
Which solution will meet these requirements with the LEAST development effort?

A. Use Amazon EMR and Apache Ranger.
B. Use a Hive metastore on an EMR cluster.
C. Use the AWS Glue Data Catalog.
D. Use a metastore on an Amazon RDS for MySQL DB instance.

Answer: C

Explanation:
The AWS Glue Data Catalog is an Apache Hive metastore-compatible catalog that provides a central metadata repository for various data sources and formats. You can use the AWS Glue Data Catalog as an external Hive metastore for Amazon EMR and Amazon Athena queries, and import metadata from existing Hive metastores into the Data Catalog. This solution requires the least development effort, as you can use AWS Glue crawlers to automatically discover and catalog the metadata from Hive, and use the AWS Glue console, AWS CLI, or Amazon EMR API to configure the Data Catalog as the Hive metastore. The other options are either more complex or require additional steps, such as setting up Apache Ranger for security, managing a Hive metastore on an EMR cluster or an RDS instance, or migrating the metadata manually. References:
? Using the AWS Glue Data Catalog as the metastore for Hive (Section: Specifying AWS Glue Data Catalog as the metastore)
? Metadata Management: Hive Metastore vs AWS Glue (Section: AWS Glue Data Catalog)
? AWS Glue Data Catalog support for Spark SQL jobs (Section: Importing metadata from an existing Hive metastore)
? AWS Certified Data Engineer - Associate DEA-C01 Complete Study Guide (Chapter 5, page 131)

NEW QUESTION 97
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