

## Professional Cloud Architect

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Professional Cloud Architect



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## JencoMart

### Testlet 1

#### Company Overview

JencoMart is a global retailer with over 10,000 stores in 16 countries. The stores carry a range of goods, such as groceries, tires, and jewelry. One of the company's core values is excellent customer service. In addition, they recently introduced an environmental policy to reduce their carbon output by 50% over the next 5 years.

#### Company Background

JencoMart started as a general store in 1931, and has grown into one of the world's leading brands, known for great value and customer service. Over time, the company transitioned from only physical stores to a stores and online hybrid model, with 25% of sales online. Currently, JencoMart has little presence in Asia, but considers that market key for future growth.

#### Solution Concept

JencoMart wants to migrate several critical applications to the cloud but has not completed a technical review to determine their suitability for the cloud and the engineering required for migration. They currently host all of these applications on infrastructure that is at its end of life and is no longer supported.

#### Existing Technical Environment

JencoMart hosts all of its applications in 4 data centers: 3 in North American and 1 in Europe; most applications are dual-homed.

JencoMart understands the dependencies and resource usage metrics of their on-premises architecture.

Application: Customer loyalty portal

LAMP (Linux, Apache, MySQL and PHP) application served from the two JencoMart-owned U.S. data centers.

#### Database

- Oracle Database stores user profiles
  - 20 TB
  - Complex table structure
  - Well maintained, clean data
  - Strong backup strategy
- PostgreSQL database stores user credentials
  - Single-homed in US West
  - No redundancy

- Backed up every 12 hours
- 100% uptime service level agreement (SLA)
- Authenticates all users

#### Compute

- 30 machines in US West Coast, each machine has:
  - Twin, dual core CPUs
  - 32 GB of RAM
  - Twin 250 GB HDD (RAID 1)
- 20 machines in US East Coast, each machine has:
  - Single, dual-core CPU
  - 24 GB of RAM
  - Twin 250 GB HDD (RAID 1)

#### Storage

- Access to shared 100 TB SAN in each location
- Tape backup every week

#### Business Requirements

- Optimize for capacity during peak periods and value during off-peak periods
- Guarantee service availability and support
- Reduce on-premises footprint and associated financial and environmental impact
- Move to outsourcing model to avoid large upfront costs associated with infrastructure purchase
- Expand services into Asia

#### Technical Requirements

- Assess key application for cloud suitability
- Modify applications for the cloud
- Move applications to a new infrastructure
- Leverage managed services wherever feasible
- Sunset 20% of capacity in existing data centers
- Decrease latency in Asia

#### CEO Statement

JencoMart will continue to develop personal relationships with our customers as more people access the web. The future of our retail business is in the global market and the connection between online and in-store experiences. As a large, global company, we also have a responsibility to the environment through “green” initiatives and policies.

**CTO Statement**

The challenges of operating data centers prevent focus on key technologies critical to our long-term success. Migrating our data services to a public cloud infrastructure will allow us to focus on big data and machine learning to improve our service to customers.

**CFO Statement**

Since its founding, JencoMart has invested heavily in our data services infrastructure. However, because of changing market trends, we need to outsource our infrastructure to ensure our long-term success. This model will allow us to respond to increasing customer demand during peak periods and reduce costs.

**QUESTION 1**

The JencoMart security team requires that all Google Cloud Platform infrastructure is deployed using a least privilege model with separation of duties for administration between production and development resources.



<https://vceplus.com/>

What Google domain and project structure should you recommend?

- A. Create two G Suite accounts to manage users: one for development/test/staging and one for production. Each account should contain one project for every application
- B. Create two G Suite accounts to manage users: one with a single project for all development applications and one with a single project for all production applications
- C. Create a single G Suite account to manage users with each stage of each application in its own project
- D. Create a single G Suite account to manage users with one project for the development/test/staging environment and one project for the production environment

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Note: The principle of least privilege and separation of duties are concepts that, although semantically different, are intrinsically related from the standpoint of security. The intent behind both is to prevent people from having higher privilege levels than they actually need

- Principle of Least Privilege: Users should only have the least amount of privileges required to perform their job and no more. This reduces authorization exploitation by limiting access to resources such as targets, jobs, or monitoring templates for which they are not authorized.
- Separation of Duties: Beyond limiting user privilege level, you also limit user duties, or the specific jobs they can perform. No user should be given responsibility for more than one related function. This limits the ability of a user to perform a malicious action and then cover up that action. Reference:

<https://cloud.google.com/kms/docs/separation-of-duties>

## QUESTION 2

A few days after JencoMart migrates the user credentials database to Google Cloud Platform and shuts down the old server, the new database server stops responding to SSH connections. It is still serving database requests to the application servers correctly.

What three steps should you take to diagnose the problem? (Choose three.)

- A. Delete the virtual machine (VM) and disks and create a new one
- B. Delete the instance, attach the disk to a new VM, and investigate
- C. Take a snapshot of the disk and connect to a new machine to investigate
- D. Check inbound firewall rules for the network the machine is connected to
- E. Connect the machine to another network with very simple firewall rules and investigate
- F. Print the Serial Console output for the instance for troubleshooting, activate the interactive console, and investigate

**Correct Answer:** CDF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

D: Handling "Unable to connect on port 22" error message

Possible causes include:

- There is no firewall rule allowing SSH access on the port. SSH access on port 22 is enabled on all Compute Engine instances by default. If you have disabled access, SSH from the Browser will not work. If you run sshd on a port other than 22, you need to enable the access to that port with a custom firewall rule. ▪ The firewall rule allowing SSH access is enabled, but is not configured to allow connections from GCP Console services. Source IP addresses for browserbased SSH sessions are dynamically allocated by GCP Console and can vary from session to session.

F: Handling "Could not connect, retrying..." error

You can verify that the daemon is running by navigating to the serial console output page and looking for output lines prefixed with the accounts-from-metadata: string. If you are using a standard image but you do not see these output prefixes in the serial console output, the daemon might be stopped. Reboot the instance to restart the daemon.

Reference:

<https://cloud.google.com/compute/docs/ssh-in-browser> <https://cloud.google.com/compute/docs/ssh-in-browser> **QUESTION 3**

JencoMart has decided to migrate user profile storage to Google Cloud Datastore and the application servers to Google Compute Engine (GCE). During the migration, the existing infrastructure will need access to Datastore to upload the data.

What service account key-management strategy should you recommend?

- A. Provision service account keys for the on-premises infrastructure and for the GCE virtual machines (VMs)
- B. Authenticate the on-premises infrastructure with a user account and provision service account keys for the VMs
- C. Provision service account keys for the on-premises infrastructure and use Google Cloud Platform (GCP) managed keys for the VMs
- D. Deploy a custom authentication service on GCE/Google Kubernetes Engine (GKE) for the on-premises infrastructure and use GCP managed keys for the VMs

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

Migrating data to Google Cloud Platform

Let's say that you have some data processing that happens on another cloud provider and you want to transfer the processed data to Google Cloud Platform. You can use a service account from the virtual machines on the external cloud to push the data to Google Cloud Platform. To do this, you must create and download a service account key when you create the service account and then use that key from the external process to call the Cloud Platform APIs.

Reference: [https://cloud.google.com/iam/docs/understanding-service-accounts#migrating\\_data\\_to\\_google\\_cloud\\_platform](https://cloud.google.com/iam/docs/understanding-service-accounts#migrating_data_to_google_cloud_platform)

#### **QUESTION 4**

JencoMart has built a version of their application on Google Cloud Platform that serves traffic to Asia. You want to measure success against their business and technical goals.

Which metrics should you track?



- A. Error rates for requests from Asia
- B. Latency difference between US and Asia
- C. Total visits, error rates, and latency from Asia
- D. Total visits and average latency for users from Asia
- E. The number of character sets present in the database

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

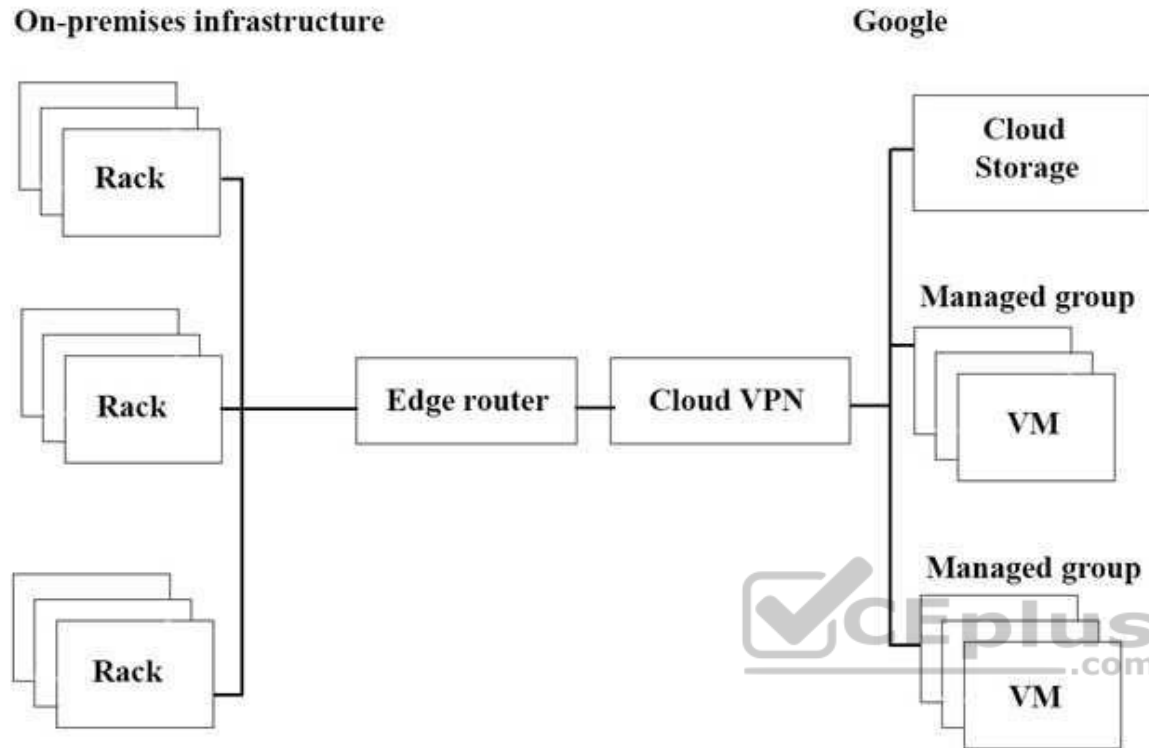
From scenario:

Business Requirements include: Expand services into Asia

Technical Requirements include: Decrease latency in Asia

**QUESTION 5**





The migration of JencoMart's application to Google Cloud Platform (GCP) is progressing too slowly. The infrastructure is shown in the diagram. You want to maximize throughput.

What are three potential bottlenecks? (Choose three.)

- A. A single VPN tunnel, which limits throughput
- B. A tier of Google Cloud Storage that is not suited for this task
- C. A copy command that is not suited to operate over long distances
- D. Fewer virtual machines (VMs) in GCP than on-premises machines
- E. A separate storage layer outside the VMs, which is not suited for this task
- F. Complicated internet connectivity between the on-premises infrastructure and GCP

**Correct Answer:** ACE



**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 6**

JencoMart wants to move their User Profiles database to Google Cloud Platform.

Which Google Database should they use?

- A. Cloud Spanner
- B. Google BigQuery
- C. Google Cloud SQL
- D. Google Cloud Datastore

**Correct Answer: D**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

Common workloads for Google Cloud Datastore:

- User profiles
- Product catalogs
- Game state

Reference: <https://cloud.google.com/storage-options/>  
<https://cloud.google.com/datastore/docs/concepts/overview>



## **Mountkirk Games, A**

### **Testlet 1**

#### **Company Overview**

Mountkirk Games makes online, session-based, multiplayer games for the most popular mobile platforms. They build all of their games using some server-side integration. Historically, they have used cloud providers to lease physical servers.

Due to the unexpected popularity of some of their games, they have had problems scaling their global audience, application servers MySQL databases, and analytics tools.

Their current model is to write game statistics to files and send them through an ETL tool that loads them into a centralized MySQL database for reporting.

#### **Solution Concept**

Mountkirk Games is building a new game, which they expect to be very popular. They plan to deploy the game's backend on Google Compute Engine so they can capture streaming metrics run intensive analytics, and take advantage of its autoscaling server environment and integrate with a managed NoSQL database.

#### **Business Requirements**

- Increase to a global footprint
- Improve uptime – downtime is loss of players
- Increase efficiency of the clous resources we use
- Reduce lateny to all customers



#### **Technical Requirements**

##### **Requirements for Game Backend Platform**

1. Dynamically scale up or down based on game activity
2. Connect to a managed NoSQL database service
3. Run customize Linux distro

##### **Requirements for Game Analytics Platform**

1. Dynamically scale up or down based on game activity
2. Process incoming data on the fly directly from the game servers
3. Process data that arrives late because of slow mobile networks
4. Allow SQL queries to access at least 10 TB of historical data
5. Process files that are regularly uploaded by users' mobile devices
6. Use only fully managed services

**CEO Statement**

Our last successful game did not scale well with our previous cloud provider, resulting in lower user adoption and affecting the game's reputation. Our investors want more key performance indicators (KPIs) to evaluate the speed and stability of the game, as well as other metrics that provide deeper insight into usage patterns so we can adapt the game to target users.

**CTO Statement**

Our current technology stack cannot provide the scale we need, so we want to replace MySQL and move to an environment that provides autoscaling, low latency load balancing, and frees us up from managing physical servers.

**CFO Statement**

We are not capturing enough user demographic data, usage metrics, and other KPIs. As a result, we do not engage the right users, we are not confident that our marketing is targeting the right users, and we are not selling enough premium Blast-Ups inside the games, which dramatically impacts our revenue.

**QUESTION 1**

Mountkirk Games wants you to design their new testing strategy. How should the test coverage differ from their existing backends on the other platforms?

- A. Tests should scale well beyond the prior approaches
- B. Unit tests are no longer required, only end-to-end tests
- C. Tests should be applied after the release is in the production environment
- D. Tests should include directly testing the Google Cloud Platform (GCP) infrastructure

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

From Scenario:

A few of their games were more popular than expected, and they had problems scaling their application servers, MySQL databases, and analytics tools.

Requirements for Game Analytics Platform include: Dynamically scale up or down based on game activity

**QUESTION 2**

Mountkirk Games has deployed their new backend on Google Cloud Platform (GCP). You want to create a through testing process for new versions of the backend before they are released to the public. You want the testing environment to scale in an economical way. How should you design the process? A. Create a scalable environment in GCP for simulating production load

- B. Use the existing infrastructure to test the GCP-based backend at scale
- C. Build stress tests into each component of your application using resources internal to GCP to simulate load
- D. Create a set of static environments in GCP to test different levels of load – for example, high, medium, and low

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

From scenario: Requirements for Game Backend Platform

1. Dynamically scale up or down based on game activity
2. Connect to a managed NoSQL database service
3. Run customize Linux distro



### QUESTION 3

Mountkirk Games wants to set up a continuous delivery pipeline. Their architecture includes many small services that they want to be able to update and roll back quickly. Mountkirk Games has the following requirements:

- Services are deployed redundantly across multiple regions in the US and Europe
- Only frontend services are exposed on the public internet
- They can provide a single frontend IP for their fleet of services
- Deployment artifacts are immutable

Which set of products should they use?

- A. Google Cloud Storage, Google Cloud Dataflow, Google Compute Engine
- B. Google Cloud Storage, Google App Engine, Google Network Load Balancer
- C. Google Kubernetes Registry, Google Container Engine, Google HTTP(S) Load Balancer
- D. Google Cloud Functions, Google Cloud Pub/Sub, Google Cloud Deployment Manager

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 4**

Mountkirk Games' gaming servers are not automatically scaling properly. Last month, they rolled out a new feature, which suddenly became very popular. A record number of users are trying to use the service, but many of them are getting 503 errors and very slow response times. What should they investigate first?

- A. Verify that the database is online
- B. Verify that the project quota hasn't been exceeded
- C. Verify that the new feature code did not introduce any performance bugs
- D. Verify that the load-testing team is not running their tool against production

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation: 503 is service unavailable error. If the database was online everyone would get the 503 error.

**QUESTION 5**

Mountkirk Games needs to create a repeatable and configurable mechanism for deploying isolated application environments. Developers and testers can access each other's environments and resources, but they cannot access staging or production resources. The staging environment needs access to some services from production.

What should you do to isolate development environments from staging and production?

- A. Create a project for development and test and another for staging and production
- B. Create a network for development and test and another for staging and production
- C. Create one subnetwork for development and another for staging and production
- D. Create one project for development, a second for staging and a third for production

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 6**

Mountkirk Games wants to set up a real-time analytics platform for their new game. The new platform must meet their technical requirements.

Which combination of Google technologies will meet all of their requirements?

- A. Kubernetes Engine, Cloud Pub/Sub, and Cloud SQL
- B. Cloud Dataflow, Cloud Storage, Cloud Pub/Sub, and BigQuery
- C. Cloud SQL, Cloud Storage, Cloud Pub/Sub, and Cloud Dataflow
- D. Cloud Dataproc, Cloud Pub/Sub, Cloud SQL, and Cloud Dataflow
- E. Cloud Pub/Sub, Compute Engine, Cloud Storage, and Cloud Dataproc

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Ingest millions of streaming events per second from anywhere in the world with Cloud Pub/Sub, powered by Google's unique, high-speed private network. Process the streams with Cloud Dataflow to ensure reliable, exactly-once, low-latency data transformation. Stream the transformed data into BigQuery, the cloud-native data warehousing service, for immediate analysis via SQL or popular visualization tools.

From scenario: They plan to deploy the game's backend on Google Compute Engine so they can capture streaming metrics, run intensive analytics.

Requirements for Game Analytics Platform

1. Dynamically scale up or down based on game activity
2. Process incoming data on the fly directly from the game servers
3. Process data that arrives late because of slow mobile networks
4. Allow SQL queries to access at least 10 TB of historical data
5. Process files that are regularly uploaded by users' mobile devices
6. Use only fully managed services

Reference: <https://cloud.google.com/solutions/big-data/stream-analytics/>

**Mountkirk Games, B**

**Testlet 1**

**Company Overview**

Mountkirk Games makes online, session-based, multiplayer games for mobile platforms. They build all of their games using some server-side integration. Historically, they have used cloud providers to lease physical servers.

Due to the unexpected popularity of some of their games, they have had problems scaling their global audience, application servers, MySQL databases, and analytics tools.

Their current model is to write game statistics to files and send them through an ETL tool that loads them into a centralized MySQL database for reporting.

### **Solution Concept**

Mountkirk Games is building a new game, which they expect to be very popular. They plan to deploy the game's backend on Google Compute Engine so they can capture streaming metrics, run intensive analytics, and take advantage of its autoscaling server environment and integrate with a managed NoSQL database.

### **Business Requirements**

- Increase to a global footprint
- Improve uptime – downtime is loss of players
- Increase efficiency of the cloud resources we use
- Reduce latency to all customers

### **Technical Requirements**

Requirements for Game Backend Platform

- Dynamically scale up or down based on game activity
- Connect to a transactional database service to manage user profiles and game state
- Store game activity in a timeseries database service for future analysis
- As the system scales, ensure that data is not lost due to processing backlogs

Run hardened Linux distro

Requirements for Game Analytics Platform

- Dynamically scale up or down based on game activity
- Process incoming data on the fly directly from the game servers
- Process data that arrives late because of slow mobile networks
- Allow queries to access at least 10 TB of historical data
- Process files that are regularly uploaded by users' mobile devices

### **Executive Statement**

Our last successful game did not scale well with our previous cloud provider, resulting in lower user adoption and affecting the game's reputation. Our investors want more key performance indicators (KPIs) to evaluate the speed and stability of the game, as well as other metrics that provide deeper insight into usage

patterns so we can adapt the game to target users. Additionally, our current technology stack cannot provide the scale we need, so we want to replace MySQL and move to an environment that provides autoscaling, low latency load balancing, and frees us up from managing physical servers.

### QUESTION 1

For this question, refer to the Mountkirk Games case study. Mountkirk Games wants to migrate from their current analytics and statistics reporting model to one that meets their technical requirements on Google Cloud Platform.

Which two steps should be part of their migration plan? (Choose two.)

- A. Evaluate the impact of migrating their current batch ETL code to Cloud Dataflow.
- B. Write a schema migration plan to denormalize data for better performance in BigQuery.
- C. Draw an architecture diagram that shows how to move from a single MySQL database to a MySQL cluster.
- D. Load 10 TB of analytics data from a previous game into a Cloud SQL instance, and run test queries against the full dataset to confirm that they complete successfully.
- E. Integrate Cloud Armor to defend against possible SQL injection attacks in analytics files uploaded to Cloud Storage.

**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**



### QUESTION 2

For this question, refer to the Mountkirk Games case study. You need to analyze and define the technical architecture for the compute workloads for your company, Mountkirk Games. Considering the Mountkirk Games business and technical requirements, what should you do?

- A. Create network load balancers. Use preemptible Compute Engine instances.
- B. Create network load balancers. Use non-preemptible Compute Engine instances.
- C. Create a global load balancer with managed instance groups and autoscaling policies. Use preemptible Compute Engine instances.
- D. Create a global load balancer with managed instance groups and autoscaling policies. Use non-preemptible Compute Engine instances.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 3



For this question, refer to the Mountkirk Games case study. Mountkirk Games wants to design their solution for the future in order to take advantage of cloud and technology improvements as they become available. Which two steps should they take? (Choose two.)

- A. Store as much analytics and game activity data as financially feasible today so it can be used to train machine learning models to predict user behavior in the future.
- B. Begin packaging their game backend artifacts in container images and running them on Google Kubernetes Engine to improve the ability to scale up or down based on game activity.
- C. Set up a CI/CD pipeline using Jenkins and Spinnaker to automate canary deployments and improve development velocity.
- D. Adopt a schema versioning tool to reduce downtime when adding new game features that require storing additional player data in the database.
- E. Implement a weekly rolling maintenance process for the Linux virtual machines so they can apply critical kernel patches and package updates and reduce the risk of 0-day vulnerabilities.

**Correct Answer:** CE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 4

For this question, refer to the Mountkirk Games case study. Mountkirk Games wants you to design a way to test the analytics platform's resilience to changes in mobile network latency. What should you do?

- A. Deploy failure injection software to the game analytics platform that can inject additional latency to mobile client analytics traffic.
- B. Build a test client that can be run from a mobile phone emulator on a Compute Engine virtual machine, and run multiple copies in Google Cloud Platform regions all over the world to generate realistic traffic.
- C. Add the ability to introduce a random amount of delay before beginning to process analytics files uploaded from mobile devices.
- D. Create an opt-in beta of the game that runs on players' mobile devices and collects response times from analytics endpoints running in Google Cloud Platform regions all over the world.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 5

For this question, refer to the Mountkirk Games case study. You need to analyze and define the technical architecture for the database workloads for your company, Mountkirk Games. Considering the business and technical requirements, what should you do?

- A. Use Cloud SQL for time series data, and use Cloud Bigtable for historical data queries.
- B. Use Cloud SQL to replace MySQL, and use Cloud Spanner for historical data queries.
- C. Use Cloud Bigtable to replace MySQL, and use BigQuery for historical data queries.
- D. Use Cloud Bigtable for time series data, use Cloud Spanner for transactional data, and use BigQuery for historical data queries.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 6

For this question, refer to the Mountkirk Games case study. Which managed storage option meets Mountkirk's technical requirement for storing game activity in a time series database service?

- A. Cloud Bigtable
- B. Cloud Spanner
- C. BigQuery
- D. Cloud Datastore



**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 7

For this question, refer to the Mountkirk Games case study. You are in charge of the new Game Backend Platform architecture. The game communicates with the backend over a REST API.

You want to follow Google-recommended practices. How should you design the backend?

- A. Create an instance template for the backend. For every region, deploy it on a multi-zone managed instance group. Use an L4 load balancer.

- B. Create an instance template for the backend. For every region, deploy it on a single-zone managed instance group. Use an L4 load balancer.
- C. Create an instance template for the backend. For every region, deploy it on a multi-zone managed instance group. Use an L7 load balancer.
- D. Create an instance template for the backend. For every region, deploy it on a single-zone managed instance group. Use an L7 load balancer.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**



## TerramEarth, A

### Testlet 1

#### Company Overview

TerramEarth manufactures heavy equipment for the mining and agricultural industries: about 80% of their business is from mining and 20% from agriculture. They currently have over 500 dealers and service centers in 100 countries. Their mission is to build products that make their customers more productive.

#### Company background

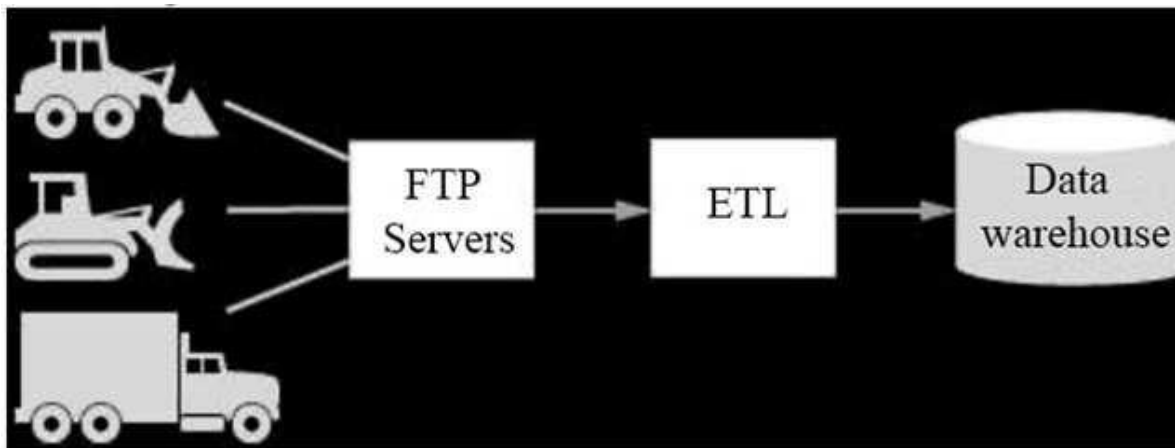
TerramEarth was formed in 1946, when several small, family owned companies combined to retool after World War II. The company cares about their employees and customers and considers them to be extended members of their family.

TerramEarth is proud of their ability to innovate on their core products and find new markets as their customers' needs change. For the past 20 years, trends in the industry have been largely toward increasing productivity by using larger vehicles with a human operator.

#### Solution Concept

There are 20 million TerramEarth vehicles in operation that collect 120 fields of data per second. Data is stored locally on the vehicle and can be accessed for analysis when a vehicle is serviced. The data is downloaded via a maintenance port. This same port can be used to adjust operational parameters, allowing the vehicles to be upgraded in the field with new computing modules.

Approximately 200,000 vehicles are connected to a cellular network, allowing TerramEarth to collect data directly. At a rate of 120 fields of data per second with 22 hours of operation per day, Terram Earth collects a total of about 9 TB/day from these connected vehicles. **Existing Technical Environment**



TerramEarth's existing architecture is composed of Linux-based systems that reside in a data center. These systems gzip CSV files from the field and upload via FTP, transform and aggregate them, and place the data in their data warehouse. Because this process takes time, aggregated reports are based on data that is 3 weeks old.

With this data, TerramEarth has been able to preemptively stock replacement parts and reduce unplanned downtime of their vehicles by 60%. However, because the data is stale, some customers are without their vehicles for up to 4 weeks while they wait for replacement parts.

### **Business Requirements**

- Decrease unplanned vehicle downtime to less than 1 week, without increasing the cost of carrying surplus inventory
- Support the dealer network with more data on how their customers use their equipment to better position new products and services
- Have the ability to partner with different companies – especially with seed and fertilizer suppliers in the fast-growing agricultural business – to create compelling joint offerings for their customers.

### **CEO Statement**

We have been successful in capitalizing on the trend toward larger vehicles to increase the productivity of our customers. Technological change is occurring rapidly, and TerramEarth has taken advantage of connected devices technology to provide our customers with better services, such as our intelligent farming equipment. With this technology, we have been able to increase farmers' yields by 25%, by using past trends to adjust how our vehicles operate. These advances have led to the rapid growth of our agricultural product line, which we expect will generate 50% of our revenues by 2020.

### **CTO Statement**

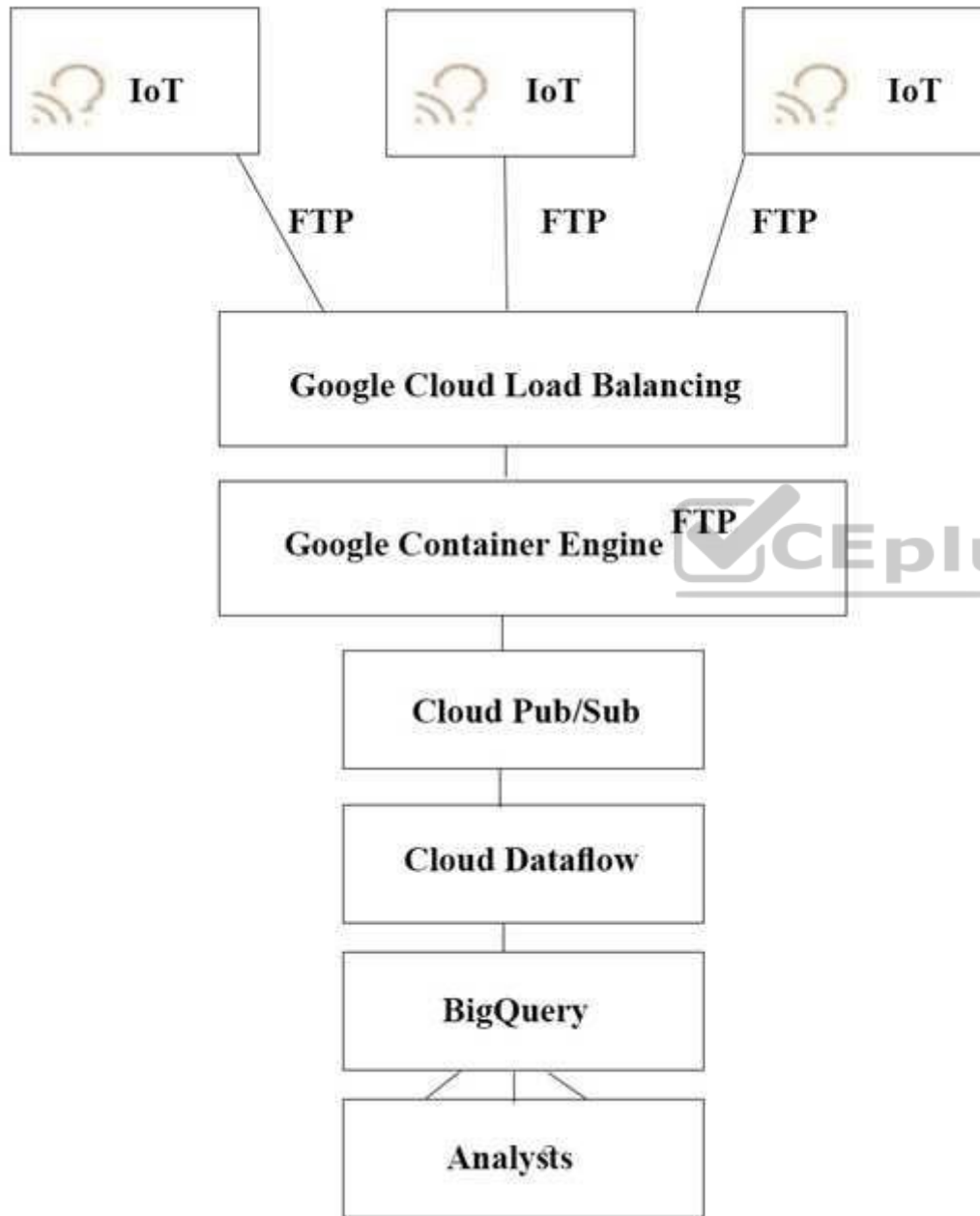
Our competitive advantage has always been in the manufacturing process, with our ability to build better vehicles for lower cost than our competitors. However, new products with different approaches are constantly being developed, and I'm concerned that we lack the skills to undergo the next wave of transformations in our industry. Unfortunately, our CEO doesn't take technology obsolescence seriously and he considers the many new companies in our industry to be niche players. My goals are to build our skills while addressing immediate market needs through incremental innovations.

### **QUESTION 1**

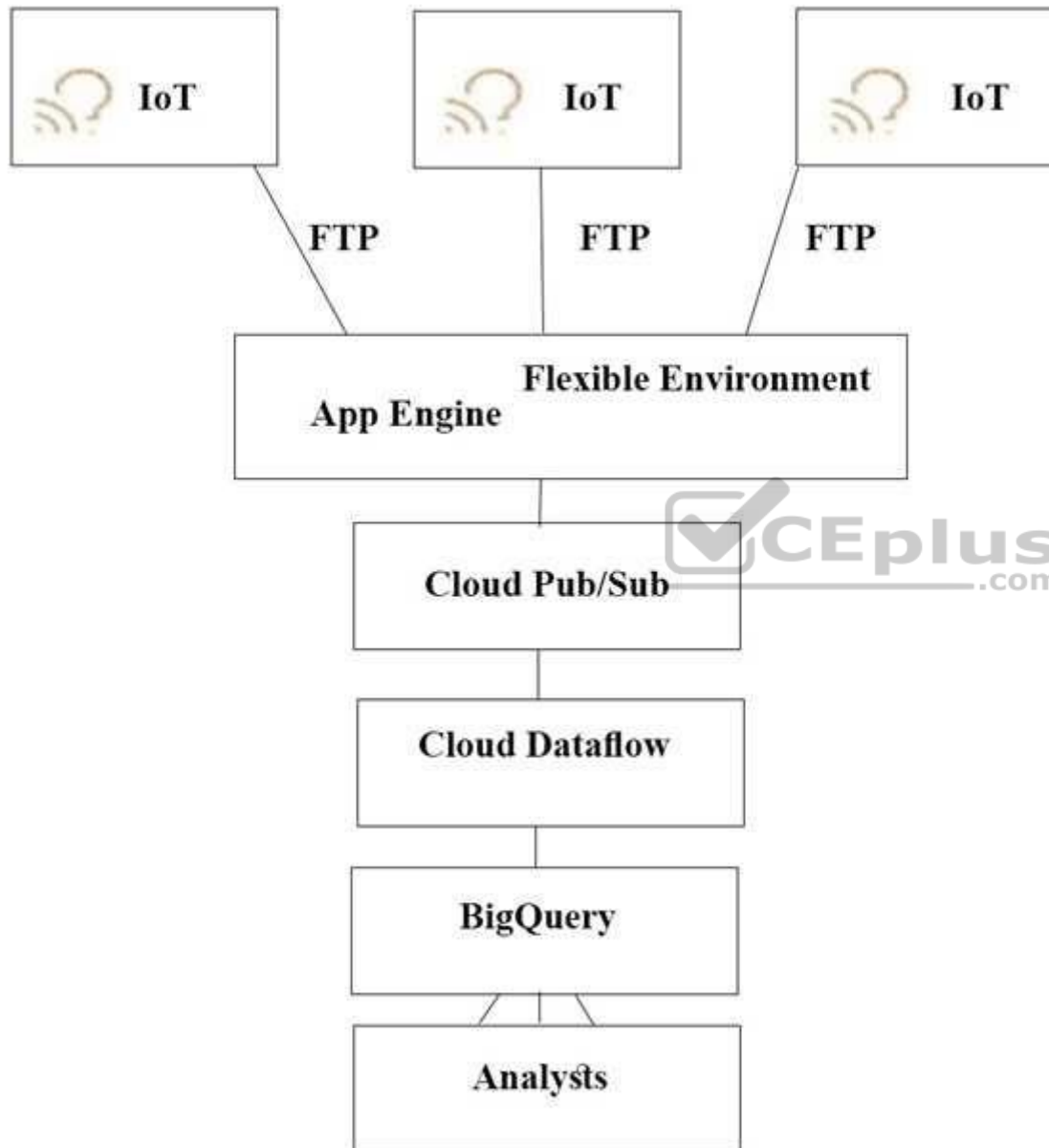
TerramEarth's CTO wants to use the raw data from connected vehicles to help identify approximately when a vehicle in the field will have a catastrophic failure. You want to allow analysts to centrally query the vehicle data.

Which architecture should you recommend?

A.

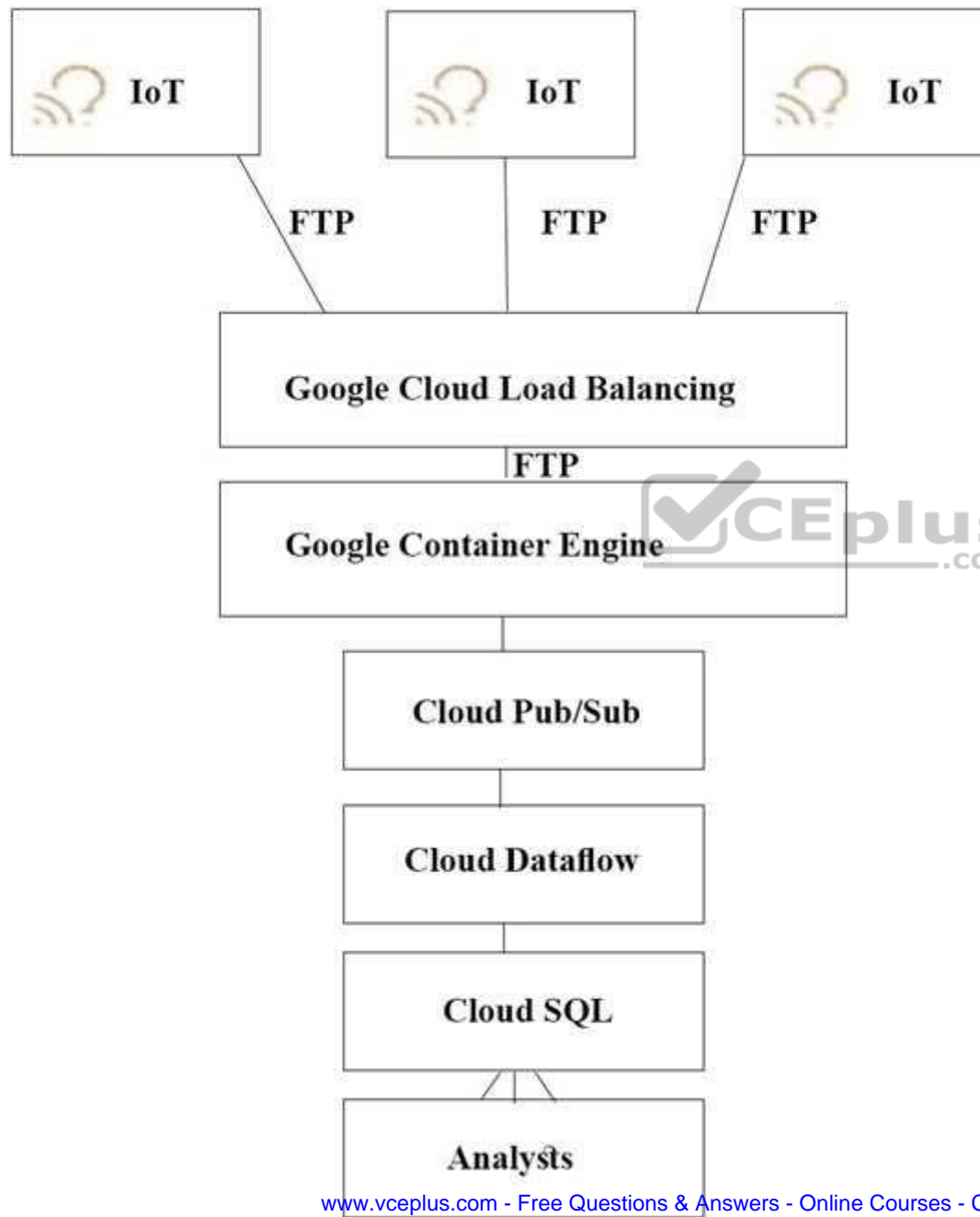


B.



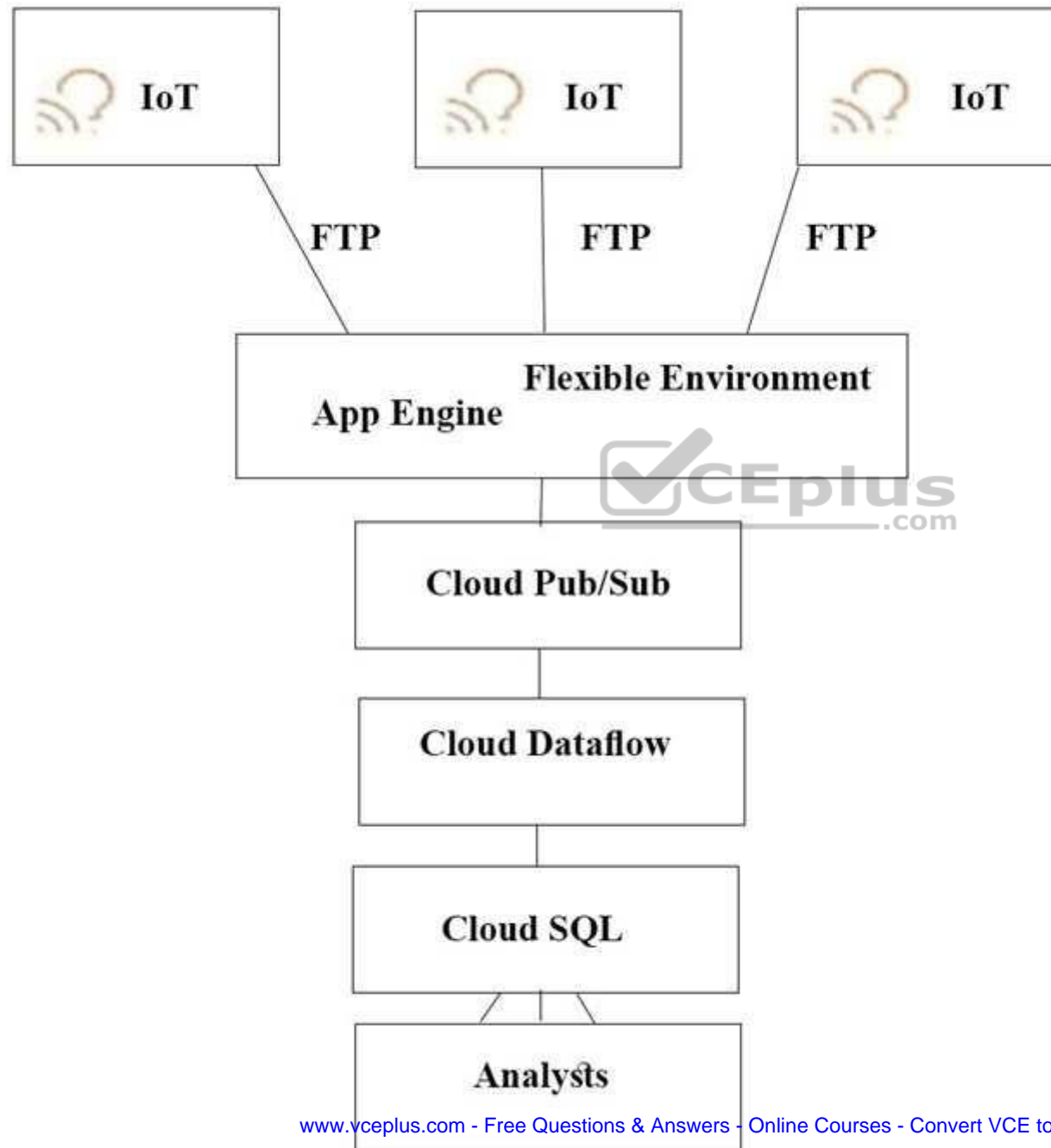
<https://vceplus.com/>

C.





D.



**Correct Answer:** A

**Section:** (none)

**Explanation**

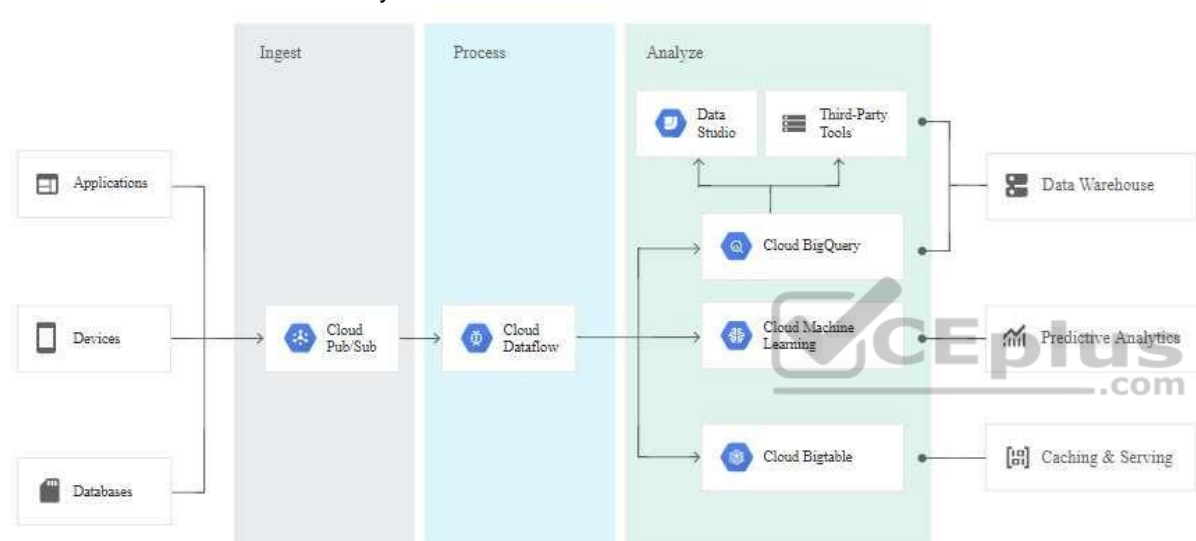
**Explanation/Reference:**

Explanation:

The push endpoint can be a load balancer.

A container cluster can be used.

Cloud Pub/Sub for Stream Analytics



Reference: <https://cloud.google.com/pubsub/>

<https://cloud.google.com/solutions/iot/>

<https://cloud.google.com/solutions/designing-connected-vehicle-platform>

[https://cloud.google.com/solutions/designing-connected-vehicle-platform#data\\_ingestion](https://cloud.google.com/solutions/designing-connected-vehicle-platform#data_ingestion)

<http://www.eweek.com/big-data-and-analytics/google-touts-value-of-cloud-iot-core-for-analyzing-connected-car-data>

<https://cloud.google.com/solutions/iot/>

## QUESTION 2

The TerramEarth development team wants to create an API to meet the company's business requirements. You want the development team to focus their development effort on business value versus creating a custom framework.



<https://vceplus.com/> Which method

should they use?

- A. Use Google App Engine with Google Cloud Endpoints. Focus on an API for dealers and partners
- B. Use Google App Engine with a JAX-RS Jersey Java-based framework. Focus on an API for the public
- C. Use Google App Engine with the Swagger (Open API Specification) framework. Focus on an API for the public
- D. Use Google Container Engine with a Django Python container. Focus on an API for the public
- E. Use Google Container Engine with a Tomcat container with the Swagger (Open API Specification) framework. Focus on an API for dealers and partners

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Develop, deploy, protect and monitor your APIs with Google Cloud Endpoints. Using an Open API Specification or one of our API frameworks, Cloud Endpoints gives you the tools you need for every phase of API development.

From scenario:

Business Requirements

Decrease unplanned vehicle downtime to less than 1 week, without increasing the cost of carrying surplus inventory

Support the dealer network with more data on how their customers use their equipment to better position new products and services

Have the ability to partner with different companies – especially with seed and fertilizer suppliers in the fast-growing agricultural business – to create compelling joint offerings for their customers.

Reference: <https://cloud.google.com/certification/guides/cloud-architect/casestudy-terramearth>

**QUESTION 3**

<https://vceplus.com/>

Your development team has created a structured API to retrieve vehicle data. They want to allow third parties to develop tools for dealerships that use this vehicle event data. You want to support delegated authorization against this data.

What should you do?

- A. Build or leverage an OAuth-compatible access control system
- B. Build SAML 2.0 SSO compatibility into your authentication system
- C. Restrict data access based on the source IP address of the partner systems
- D. Create secondary credentials for each dealer that can be given to the trusted third party

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Delegate application authorization with OAuth2

Cloud Platform APIs support OAuth 2.0, and scopes provide granular authorization over the methods that are supported. Cloud Platform supports both serviceaccount and user-account OAuth, also called three-legged OAuth.

Reference: [https://cloud.google.com/docs/enterprise/best-practices-for-enterprise-organizations#delegate\\_application\\_authorization\\_with\\_oauth2](https://cloud.google.com/docs/enterprise/best-practices-for-enterprise-organizations#delegate_application_authorization_with_oauth2)  
<https://cloud.google.com/appengine/docs/flexible/go/authorizing-apps>

#### QUESTION 4

TerramEarth plans to connect all 20 million vehicles in the field to the cloud. This increases the volume to 20 million 600 byte records a second for 40 TB an hour.

How should you design the data ingestion?

- A. Vehicles write data directly to GCS
- B. Vehicles write data directly to Google Cloud Pub/Sub
- C. Vehicles stream data directly to Google BigQuery
- D. Vehicles continue to write data using the existing system (FTP)

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 5**

You analyzed TerramEarth's business requirement to reduce downtime, and found that they can achieve a majority of time saving by reducing customer's wait time for parts. You decided to focus on reduction of the 3 weeks aggregate reporting time.

Which modifications to the company's processes should you recommend?

- A. Migrate from CSV to binary format, migrate from FTP to SFTP transport, and develop machine learning analysis of metrics
- B. Migrate from FTP to streaming transport, migrate from CSV to binary format, and develop machine learning analysis of metrics
- C. Increase fleet cellular connectivity to 80%, migrate from FTP to streaming transport, and develop machine learning analysis of metrics
- D. Migrate from FTP to SFTP transport, develop machine learning analysis of metrics, and increase dealer local inventory by a fixed factor

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

The Avro binary format is the preferred format for loading compressed data. Avro data is faster to load because the data can be read in parallel, even when the data blocks are compressed.

Cloud Storage supports streaming transfers with the gsutil tool or boto library, based on HTTP chunked transfer encoding. Streaming data lets you stream data to and from your Cloud Storage account as soon as it becomes available without requiring that the data be first saved to a separate file. Streaming transfers are useful if you have a process that generates data and you do not want to buffer it locally before uploading it, or if you want to send the result from a computational pipeline directly into Cloud Storage.

Reference: <https://cloud.google.com/storage/docs/streaming> <https://cloud.google.com/bigquery/docs/loading-data>

**QUESTION 6**

Which of TerramEarth's legacy enterprise processes will experience significant change as a result of increased Google Cloud Platform adoption?

- A. Opex/capex allocation, LAN changes, capacity planning
- B. Capacity planning, TCO calculations, opex/capex allocation
- C. Capacity planning, utilization measurement, data center expansion
- D. Data Center expansion, TCO calculations, utilization measurement

**Correct Answer: B**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

### QUESTION 7

To speed up data retrieval, more vehicles will be upgraded to cellular connections and be able to transmit data to the ETL process. The current FTP process is error-prone and restarts the data transfer from the start of the file when connections fail, which happens often. You want to improve the reliability of the solution and minimize data transfer time on the cellular connections.

What should you do?

- A. Use one Google Container Engine cluster of FTP servers. Save the data to a Multi-Regional bucket. Run the ETL process using data in the bucket
- B. Use multiple Google Container Engine clusters running FTP servers located in different regions. Save the data to Multi-Regional buckets in US, EU, and Asia. Run the ETL process using the data in the bucket
- C. Directly transfer the files to different Google Cloud Multi-Regional Storage bucket locations in US, EU, and Asia using Google APIs over HTTP(S). Run the ETL process using the data in the bucket
- D. Directly transfer the files to a different Google Cloud Regional Storage bucket location in US, EU, and Asia using Google APIs over HTTP(S). Run the ETL process to retrieve the data from each Regional bucket

**Correct Answer: D**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

### QUESTION 8

TerramEarth's 20 million vehicles are scattered around the world. Based on the vehicle's location, its telemetry data is stored in a Google Cloud Storage (GCS) regional bucket (US, Europe, or Asia). The CTO has asked you to run a report on the raw telemetry data to determine why vehicles are breaking down after 100 K miles. You want to run this job on all the data.

What is the most cost-effective way to run this job?

- A. Move all the data into 1 zone, then launch a Cloud Dataproc cluster to run the job
- B. Move all the data into 1 region, then launch a Google Cloud Dataproc cluster to run the job
- C. Launch a cluster in each region to preprocess and compress the raw data, then move the data into a multi-region bucket and use a Dataproc cluster to finish the job

- D. Launch a cluster in each region to preprocess and compress the raw data, then move the data into a region bucket and use a Cloud Dataproc cluster to finish the job

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 9

TerramEarth has equipped all connected trucks with servers and sensors to collect telemetry data. Next year they want to use the data to train machine learning models. They want to store this data in the cloud while reducing costs.

What should they do?

- A. Have the vehicle's computer compress the data in hourly snapshots, and store it in a Google Cloud Storage (GCS) Nearline bucket
- B. Push the telemetry data in real-time to a streaming dataflow job that compresses the data, and store it in Google BigQuery
- C. Push the telemetry data in real-time to a streaming dataflow job that compresses the data, and store it in Cloud Bigtable
- D. Have the vehicle's computer compress the data in hourly snapshots, and store it in a GCS Coldline bucket

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Storage is the best choice for data that you plan to access at most once a year, due to its slightly lower availability, 90-day minimum storage duration, costs for data access, and higher per-operation costs. For example:

Cold Data Storage - Infrequently accessed data, such as data stored for legal or regulatory reasons, can be stored at low cost as Coldline Storage, and be available when you need it.

Disaster recovery - In the event of a disaster recovery event, recovery time is key. Cloud Storage provides low latency access to data stored as Coldline Storage.

Reference: <https://cloud.google.com/storage/docs/storage-classes>

#### QUESTION 10

Your agricultural division is experimenting with fully autonomous vehicles. You want your architecture to promote strong security during vehicle operation.

Which two architectures should you consider? (Choose two.)

- A. Treat every micro service call between modules on the vehicle as untrusted.
- B. Require IPv6 for connectivity to ensure a secure address space.
- C. Use a trusted platform module (TPM) and verify firmware and binaries on boot.
- D. Use a functional programming language to isolate code execution cycles.
- E. Use multiple connectivity subsystems for redundancy.
- F. Enclose the vehicle's drive electronics in a Faraday cage to isolate chips.

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 11

Operational parameters such as oil pressure are adjustable on each of TerramEarth's vehicles to increase their efficiency, depending on their environmental conditions. Your primary goal is to increase the operating efficiency of all 20 million cellular and unconnected vehicles in the field.

How can you accomplish this goal?

- A. Have you engineers inspect the data for patterns, and then create an algorithm with rules that make operational adjustments automatically
- B. Capture all operating data, train machine learning models that identify ideal operations, and run locally to make operational adjustments automatically
- C. Implement a Google Cloud Dataflow streaming job with a sliding window, and use Google Cloud Messaging (GCM) to make operational adjustments automatically
- D. Capture all operating data, train machine learning models that identify ideal operations, and host in Google Cloud Machine Learning (ML) Platform to make operational adjustments automatically

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**TerramEarth, B**

**Testlet 1**

### Company Overview

TerramEarth manufactures heavy equipment for the mining and agricultural industries. About 80% of their business is from mining and 20% from agriculture. They currently have over 500 dealers and service centers in 100 countries. Their mission is to build products that make their customers more productive.



### **Solution Concept**

There are 20 million TerramEarth vehicles in operation that collect 120 fields of data per second. Data is stored locally on the vehicle and can be accessed for analysis when a vehicle is serviced. The data is downloaded via a maintenance port. This same port can be used to adjust operational parameters, allowing the vehicles to be upgraded in the field with new computing modules.

Approximately 200,000 vehicles are connected to a cellular network, allowing TerramEarth to collect data directly. At a rate of 120 fields of data per second, with 22 hours of operation per day, TerramEarth collects a total of about 9 TB/day from these connected vehicles.

### **Existing Technical Environment**

TerramEarth's existing architecture is composed of Linux and Windows-based systems that reside in a single U.S. west coast based data center. These systems gzip CSV files from the field and upload via FTP, and place the data in their data warehouse. Because this process takes time, aggregated reports are based on data that is 3 weeks old.

With this data, TerramEarth has been able to preemptively stock replacement parts and reduce unplanned downtime of their vehicles by 60%. However, because the data is stale, some customers are without their vehicles for up to 4 weeks while they wait for replacement parts.

### **Business Requirements**

- Decrease unplanned vehicle downtime to less than 1 week
- Support the dealer network with more data on how their customers use their equipment to better position new products and services
- Have the ability to partner with different companies – especially with seed and fertilizer suppliers in the fast-growing agricultural business – to create compelling joint offerings for their customers

### **Technical Requirements**

- Expand beyond a single datacenter to decrease latency to the American midwest and east coast
- Create a backup strategy
- Increase security of data transfer from equipment to the datacenter
  - Improve data in the data warehouse
  - Use customer and equipment data to anticipate customer needs

### **Application 1: Data ingest**

A custom Python application reads uploaded datafiles from a single server, writes to the data warehouse.

Compute:

- Windows Server 2008 R2
- 16 CPUs
- 128 GB of RAM
- 10 TB local HDD storage

### **Application 2: Reporting**

An off the shelf application that business analysts use to run a daily report to see what equipment needs repair. Only 2 analysts of a team of 10 (5 west coast, 5 east coast) can connect to the reporting application at a time.

Compute:

- Off the shelf application. License tied to number of physical CPUs
- Windows Server 2008 R2
- 16 CPUs
- 32 GB of RAM - 500 GB HDD

Data warehouse:

- A single PostgreSQL server
- RedHat Linux
- 64 CPUs
- 128 GB of RAM
- 4x 6TB HDD in RAID 0

### Executive Statement

Our competitive advantage has always been in our manufacturing process, with our ability to build better vehicles for lower cost than our competitors. However, new products with different approaches are constantly being developed, and I'm concerned that we lack the skills to undergo the next wave of transformations in our industry. My goals are to build our skills while addressing immediate market needs through incremental innovations.

### QUESTION 1

For this question, refer to the TerramEarth case study. To be compliant with European GDPR regulation, TerramEarth is required to delete data generated from its European customers after a period of 36 months when it contains personal data. In the new architecture, this data will be stored in both Cloud Storage and BigQuery. What should you do?

- A. Create a BigQuery table for the European data, and set the table retention period to 36 months. For Cloud Storage, use gsutil to enable lifecycle management using a DELETE action with an Age condition of 36 months.
- B. Create a BigQuery table for the European data, and set the table retention period to 36 months. For Cloud Storage, use gsutil to create a SetStorageClass to NONE action when with an Age condition of 36 months.
- C. Create a BigQuery time-partitioned table for the European data, and set the partition expiration period to 36 months. For Cloud Storage, use gsutil to enable lifecycle management using a DELETE action with an Age condition of 36 months.
- D. Create a BigQuery time-partitioned table for the European data, and set the partition expiration period to 36 months. For Cloud Storage, use gsutil to create a SetStorageClass to NONE action with an Age condition of 36 months.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

## **QUESTION 2**

For this question, refer to the TerramEarth case study. TerramEarth has decided to store data files in Cloud Storage. You need to configure Cloud Storage lifecycle rule to store 1 year of data and minimize file storage cost. Which two actions should you take?

- A. Create a Cloud Storage lifecycle rule with Age: "30", Storage Class: "Standard", and Action: "Set to Coldline", and create a second GCS life-cycle rule with Age: "365", Storage Class: "Coldline", and Action: "Delete".
- B. Create a Cloud Storage lifecycle rule with Age: "30", Storage Class: "Coldline", and Action: "Set to Nearline", and create a second GCS life-cycle rule with Age: "91", Storage Class: "Coldline", and Action: "Set to Nearline".
- C. Create a Cloud Storage lifecycle rule with Age: "90", Storage Class: "Standard", and Action: "Set to Nearline", and create a second GCS life-cycle rule with Age: "91", Storage Class: "Nearline", and Action: "Set to Coldline".
- D. Create a Cloud Storage lifecycle rule with Age: "30", Storage Class: "Standard", and Action: "Set to Coldline", and create a second GCS life-cycle rule with Age: "365", Storage Class: "Nearline", and Action: "Delete".

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**



## **QUESTION 3**

For this question, refer to the TerramEarth case study. You need to implement a reliable, scalable GCP solution for the data warehouse for your company, TerramEarth.

Considering the TerramEarth business and technical requirements, what should you do?

- A. Replace the existing data warehouse with BigQuery. Use table partitioning.
- B. Replace the existing data warehouse with a Compute Engine instance with 96 CPUs.
- C. Replace the existing data warehouse with BigQuery. Use federated data sources.
- D. Replace the existing data warehouse with a Compute Engine instance with 96 CPUs. Add an additional Compute Engine preemptible instance with 32 CPUs.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 4**

For this question, refer to the TerramEarth case study. A new architecture that writes all incoming data to BigQuery has been introduced. You notice that the data is dirty, and want to ensure data quality on an automated daily basis while managing cost.

What should you do?

- A. Set up a streaming Cloud Dataflow job, receiving data by the ingestion process. Clean the data in a Cloud Dataflow pipeline.
- B. Create a Cloud Function that reads data from BigQuery and cleans it. Trigger the Cloud Function from a Compute Engine instance.
- C. Create a SQL statement on the data in BigQuery, and save it as a view. Run the view daily, and save the result to a new table.
- D. Use Cloud Dataprep and configure the BigQuery tables as the source. Schedule a daily job to clean the data.

**Correct Answer: D**

**Section: (none)**

**Explanation**

**Explanation/Reference:**



#### **QUESTION 5**

For this question, refer to the TerramEarth case study. Considering the technical requirements, how should you reduce the unplanned vehicle downtime in GCP?

- A. Use BigQuery as the data warehouse. Connect all vehicles to the network and stream data into BigQuery using Cloud Pub/Sub and Cloud Dataflow. Use Google Data Studio for analysis and reporting.
- B. Use BigQuery as the data warehouse. Connect all vehicles to the network and upload gzip files to a Multi-Regional Cloud Storage bucket using gcloud. Use Google Data Studio for analysis and reporting.
- C. Use Cloud Dataproc Hive as the data warehouse. Upload gzip files to a Multi-Regional Cloud Storage bucket. Upload this data into BigQuery using gcloud. Use Google Data Studio for analysis and reporting.
- D. Use Cloud Dataproc Hive as the data warehouse. Directly stream data into partitioned Hive tables. Use Pig scripts to analyze data.

**Correct Answer: A**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

#### **QUESTION 6**

For this question, refer to the TerramEarth case study. You are asked to design a new architecture for the ingestion of the data of the 200,000 vehicles that are connected to a cellular network. You want to follow Google-recommended practices.

Considering the technical requirements, which components should you use for the ingestion of the data?

- A. Google Kubernetes Engine with an SSL Ingress
- B. Cloud IoT Core with public/private key pairs
- C. Compute Engine with project-wide SSH keys
- D. Compute Engine with specific SSH keys

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



## Dress4Win, A

### Testlet 1

#### Company Overview

Dress4Win is a web-based company that helps their users organize and manage their personal wardrobe using a website and mobile application. The company also cultivates an active social network that connects their users with designers and retailers. They monetize their services through advertising, e-commerce, referrals, and a premium app model.

#### Company Background

Dress4Win's application has grown from a few servers in the founder's garage to several hundred servers and appliances in a collocated data center. However, the capacity of their infrastructure is now insufficient for the application's rapid growth. Because of this growth and the company's desire to innovate faster, Dress4Win is committing to a full migration to a public cloud.

#### Solution Concept

For the first phase of their migration to the cloud, Dress4Win is considering moving their development and test environments. They are also considering building a disaster recovery site, because their current infrastructure is at a single location. They are not sure which components of their architecture they can migrate as is and which components they need to change before migrating them.

#### Existing Technical Environment

The Dress4Win application is served out of a single data center location.

- Databases:
  - MySQL - user data, inventory, static data
  - Redis - metadata, social graph, caching
  - Tomcat - Java micro-services
  - Nginx - static content
  - Apache Beam - Batch processing
  - iSCSI for VM hosts
  - Fiber channel SAN - MySQL databases
  - NAS - image storage, logs, backups
  - Real-time trending calculations
  - Messaging
  - Social notifications
  - Events
- Miscellaneous servers:
  - Jenkins, monitoring, bastion hosts, security scanners

#### Business Requirements

- Build a reliable and reproducible environment with scaled parity of production.

- Improve security by defining and adhering to a set of security and Identity and Access Management (IAM) best practices for cloud. ▪
- Improve business agility and speed of innovation through rapid provisioning of new resources.
- Analyze and optimize architecture for performance in the cloud. ▪
- Migrate fully to the cloud if all other requirements are met.

### Technical Requirements

- Evaluate and choose an automation framework for provisioning resources in cloud.
- Support failover of the production environment to cloud during an emergency.
- Identify production services that can migrate to cloud to save capacity.
- Use managed services whenever possible.
- Encrypt data on the wire and at rest.
- Support multiple VPN connections between the production data center and cloud environment.

### CEO Statement

Our investors are concerned about our ability to scale and contain costs with our current infrastructure. They are also concerned that a new competitor could use a public cloud platform to offset their up-front investment and freeing them to focus on developing better features.

### CTO Statement

We have invested heavily in the current infrastructure, but much of the equipment is approaching the end of its useful life. We are consistently waiting weeks for new gear to be racked before we can start new projects. Our traffic patterns are highest in the mornings and weekend evenings; during other times, 80% of our capacity is sitting idle.

### CFO Statement

Our capital expenditure is now exceeding our quarterly projections. Migrating to the cloud will likely cause an initial increase in spending, but we expect to fully transition before our next hardware refresh cycle. Our total cost of ownership (TCO) analysis over the next 5 years puts a cloud strategy between 30 to 50% lower than our current model.

### QUESTION 1

The Dress4Win security team has disabled external SSH access into production virtual machines (VMs) on Google Cloud Platform (GCP).

The operations team needs to remotely manage the VMs, build and push Docker containers, and manage Google Cloud Storage objects.

What can they do?

- A. Grant the operations engineer access to use Google Cloud Shell.
- B. Configure a VPN connection to GCP to allow SSH access to the cloud VMs.
- C. Develop a new access request process that grants temporary SSH access to cloud VMs when an operations engineer needs to perform a task.
- D. Have the development team build an API service that allows the operations team to execute specific remote procedure calls to accomplish their tasks.

**Correct Answer: A**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

## **QUESTION 2**

At Dress4Win, an operations engineer wants to create a low-cost solution to remotely archive copies of database backup files. The database files are compressed tar files stored in their current data center. How should he proceed?

- A. Create a cron script using gsutil to copy the files to a Coldline Storage bucket.
- B. Create a cron script using gsutil to copy the files to a Regional Storage bucket.
- C. Create a Cloud Storage Transfer Service Job to copy the files to a Coldline Storage bucket.
- D. Create a Cloud Storage Transfer Service job to copy the files to a Regional Storage bucket.

**Correct Answer: A**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

Follow these rules of thumb when deciding whether to use gsutil or Storage Transfer Service:

- \* When transferring data from an on-premises location, use gsutil.
- \* When transferring data from another cloud storage provider, use Storage Transfer Service.
- \* Otherwise, evaluate both tools with respect to your specific scenario.

Use this guidance as a starting point.

The specific details of your transfer scenario will also help you determine which tool is more appropriate.

## **QUESTION 3**

Dress4Win has asked you to recommend machine types they should deploy their application servers to.

How should you proceed?

- A. Perform a mapping of the on-premises physical hardware cores and RAM to the nearest machine types in the cloud.
- B. Recommend that Dress4Win deploy application servers to machine types that offer the highest RAM to CPU ratio available.
- C. Recommend that Dress4Win deploy into production with the smallest instances available, monitor them over time, and scale the machine type up until the desired performance is reached.



- D. Identify the number of virtual cores and RAM associated with the application server virtual machines align them to a custom machine type in the cloud, monitor performance, and scale the machine types up until the desired performance is reached.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 4

As part of Dress4Win's plans to migrate to the cloud, they want to be able to set up a managed logging and monitoring system so they can handle spikes in their traffic load.

They want to ensure that:

- \* The infrastructure can be notified when it needs to scale up and down to handle the ebb and flow of usage throughout the day
- \* Their administrators are notified automatically when their application reports errors.
- \* They can filter their aggregated logs down in order to debug one piece of the application across many hosts

Which Google StackDriver features should they use?

- A. Logging, Alerts, Insights, Debug
- B. Monitoring, Trace, Debug, Logging
- C. Monitoring, Logging, Alerts, Error Reporting
- D. Monitoring, Logging, Debug, Error Report

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 5

Dress4Win would like to become familiar with deploying applications to the cloud by successfully deploying some applications quickly, as is. They have asked for your recommendation.

What should you advise?

- A. Identify self-contained applications with external dependencies as a first move to the cloud.

- B. Identify enterprise applications with internal dependencies and recommend these as a first move to the cloud.
- C. Suggest moving their in-house databases to the cloud and continue serving requests to on-premise applications.
- D. Recommend moving their message queuing servers to the cloud and continue handling requests to on-premise applications.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 6

Dress4Win has asked you for advice on how to migrate their on-premises MySQL deployment to the cloud. They want to minimize downtime and performance impact to their on-premises solution during the migration.

Which approach should you recommend?

- A. Create a dump of the on-premises MySQL master server, and then shut it down, upload it to the cloud environment, and load into a new MySQL cluster.
- B. Setup a MySQL replica server/slave in the cloud environment, and configure it for asynchronous replication from the MySQL master server on-premises until cutover.
- C. Create a new MySQL cluster in the cloud, configure applications to begin writing to both on premises and cloud MySQL masters, and destroy the original cluster at cutover.
- D. Create a dump of the MySQL replica server into the cloud environment, load it into: Google Cloud Datastore, and configure applications to read/write to Cloud Datastore at cutover.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 7

Dress4Win has configured a new uptime check with Google Stackdriver for several of their legacy services. The Stackdriver dashboard is not reporting the services as healthy.

What should they do?

- A. Install the Stackdriver agent on all of the legacy web servers.

- B. In the Cloud Platform Console download the list of the uptime servers' IP addresses and create an inbound firewall rule
- C. Configure their load balancer to pass through the User-Agent HTTP header when the value matches GoogleStackdriverMonitoring-UptimeChecks (<https://cloud.google.com/monitoring>)
- D. Configure their legacy web servers to allow requests that contain user-Agent HTTP header when the value matches GoogleStackdriverMonitoring-UptimeChecks (<https://cloud.google.com/monitoring>)

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 8

As part of their new application experience, Dress4Wm allows customers to upload images of themselves. The customer has exclusive control over who may view these images.

Customers should be able to upload images with minimal latency and also be shown their images quickly on the main application page when they log in.

Which configuration should Dress4Win use?

- A. Store image files in a Google Cloud Storage bucket. Use Google Cloud Datastore to maintain metadata that maps each customer's ID and their image files.
- B. Store image files in a Google Cloud Storage bucket. Add custom metadata to the uploaded images in Cloud Storage that contains the customer's unique ID.
- C. Use a distributed file system to store customers' images. As storage needs increase, add more persistent disks and/or nodes. Assign each customer a unique ID, which sets each file's owner attribute, ensuring privacy of images.
- D. Use a distributed file system to store customers' images. As storage needs increase, add more persistent disks and/or nodes. Use a Google Cloud SQL database to maintain metadata that maps each customer's ID to their image files.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 9

Dress4Win has end-to-end tests covering 100% of their endpoints.

They want to ensure that the move to the cloud does not introduce any new bugs.

Which additional testing methods should the developers employ to prevent an outage?

- A. They should enable Google Stackdriver Debugger on the application code to show errors in the code.
- B. They should add additional unit tests and production scale load tests on their cloud staging environment.
- C. They should run the end-to-end tests in the cloud staging environment to determine if the code is working as intended.
- D. They should add canary tests so developers can measure how much of an impact the new release causes to latency.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 10

You want to ensure Dress4Win's sales and tax records remain available for infrequent viewing by auditors for at least 10 years.

Cost optimization is your top priority.

Which cloud services should you choose?

- A. Google Cloud Storage Coldline to store the data, and gsutil to access the data.
- B. Google Cloud Storage Nearline to store the data, and gsutil to access the data.
- C. Google Bigtable with US or EU as location to store the data, and gcloud to access the data.
- D. BigQuery to store the data, and a web server cluster in a managed instance group to access the data. Google Cloud SQL mirrored across two distinct regions to store the data, and a Redis cluster in a managed instance group to access the data.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: <https://cloud.google.com/storage/docs/storage-classes>

#### QUESTION 11

The current Dress4Win system architecture has high latency to some customers because it is located in one data center.

As of a future evaluation and optimizing for performance in the cloud, Dressss4Win wants to distribute its system architecture to multiple locations when Google cloud platform.

Which approach should they use?

- A. Use regional managed instance groups and a global load balancer to increase performance because the regional managed instance group can grow instances in each region separately based on traffic.
- B. Use a global load balancer with a set of virtual machines that forward the requests to a closer group of virtual machines managed by your operations team.
- C. Use regional managed instance groups and a global load balancer to increase reliability by providing automatic failover between zones in different regions.
- D. Use a global load balancer with a set of virtual machines that forward the requests to a closer group of virtual machines as part of a separate managed instance groups.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**



## Dress4Win, B

### Testlet 1

#### Company Overview

Dress4Win is a web-based company that helps their users organize and manage their personal wardrobe using a web app and mobile application. The company also cultivates an active social network that connects their users with designers and retailers. They monetize their services through advertising, e-commerce, referrals, and a freemium app model. The application has grown from a few servers in the founder's garage to several hundred servers and appliances in a colocated data center. However, the capacity of their infrastructure is now insufficient for the application's rapid growth. Because of this growth and the company's desire to innovate faster, Dress4Win is committing to a full migration to a public cloud.

#### Solution Concept

For the first phase of their migration to the cloud, Dress4Win is moving their development and test environments. They are also building a disaster recovery site, because their current infrastructure is at a single location. They are not sure which components of their architecture they can migrate as is and which components they need to change before migrating them.

#### Existing Technical Environment

The Dress4Win application is served out of a single data center location. All servers run Ubuntu LTS v16.04.

##### Databases:

- MySQL. 1 server for user data, inventory, static data:
  - MySQL 5.8
  - 8 core CPUs
  - 128 GB of RAM
  - 2x 5 TB HDD (RAID 1)
- Redis 3 server cluster for metadata, social graph, caching. Each server is:
  - Redis 3.2
  - 4 core CPUs - 32GB of RAM

##### Compute:

- 40 Web Application servers providing micro-services based APIs and static content.
  - Tomcat - Java
  - Nginx
  - 4 core CPUs
  - 32 GB of RAM

- 20 Apache Hadoop/Spark servers:
  - Data analysis
  - Real-time trending calculations
  - 8 core CPUs
  - 128 GB of RAM
  - 4x 5 TB HDD (RAID 1)
- 3 RabbitMQ servers for messaging, social notifications, and events:
  - 8 core CPUs
  - 32GB of RAM
- Miscellaneous servers:
  - Jenkins, monitoring, bastion hosts, security scanners
  - 8 core CPUs - 32GB of RAM

Storage appliances: ▪

iSCSI for VM hosts

- Fiber channel SAN – MySQL databases
- 1 PB total storage; 400 TB available ▪ NAS – image storage, logs, backups
- 100 TB total storage; 35 TB available

### **Business Requirements**

- Build a reliable and reproducible environment with scaled parity of production.
- Improve security by defining and adhering to a set of security and Identity and Access Management (IAM) best practices for cloud.
- Improve business agility and speed of innovation through rapid provisioning of new resources. ▪ Analyze and optimize architecture for performance in the cloud.

### **Technical Requirements**

- Easily create non-production environments in the cloud.
- Implement an automation framework for provisioning resources in cloud.
- Implement a continuous deployment process for deploying applications to the on-premises datacenter or cloud.
- Support failover of the production environment to cloud during an emergency. ▪ Encrypt data on the wire and at rest.
- Support multiple private connections between the production data center and cloud environment.

### **Executive Statement**

Our investors are concerned about our ability to scale and contain costs with our current infrastructure. They are also concerned that a competitor could use a public cloud platform to offset their up-front investment and free them to focus on developing better features. Our traffic patterns are highest in the mornings and weekend evenings; during other times, 80% of our capacity is sitting idle.

Our capital expenditure is now exceeding our quarterly projections. Migrating to the cloud will likely cause an initial increase in spending, but we expect to fully transition before our next hardware refresh cycle. Our total cost of ownership (TCO) analysis over the next 5 years for a public cloud strategy achieves a cost reduction between 30% and 50% over our current model.

### QUESTION 1

For this question, refer to the Dress4Win case study. Dress4Win is expected to grow to 10 times its size in 1 year with a corresponding growth in data and traffic that mirrors the existing patterns of usage. The CIO has set the target of migrating production infrastructure to the cloud within the next 6 months. How will you configure the solution to scale for this growth without making major application changes and still maximize the ROI?

- A. Migrate the web application layer to App Engine, and MySQL to Cloud Datastore, and NAS to Cloud Storage. Deploy RabbitMQ, and deploy Hadoop servers using Deployment Manager.
- B. Migrate RabbitMQ to Cloud Pub/Sub, Hadoop to BigQuery, and NAS to Compute Engine with Persistent Disk storage. Deploy Tomcat, and deploy Nginx using Deployment Manager.
- C. Implement managed instance groups for Tomcat and Nginx. Migrate MySQL to Cloud SQL, RabbitMQ to Cloud Pub/Sub, Hadoop to Cloud Dataproc, and NAS to Compute Engine with Persistent Disk storage.
- D. Implement managed instance groups for the Tomcat and Nginx. Migrate MySQL to Cloud SQL, RabbitMQ to Cloud Pub/Sub, Hadoop to Cloud Dataproc, and NAS to Cloud Storage.

**Correct Answer:** D

**Section:** (none)

**Explanation**



**Explanation/Reference:**

### QUESTION 2

For this question, refer to the Dress4Win case study. Considering the given business requirements, how would you automate the deployment of web and transactional data layers?

- A. Deploy Nginx and Tomcat using Cloud Deployment Manager to Compute Engine. Deploy a Cloud SQL server to replace MySQL. Deploy Jenkins using Cloud Deployment Manager.
- B. Deploy Nginx and Tomcat using Cloud Launcher. Deploy a MySQL server using Cloud Launcher. Deploy Jenkins to Compute Engine using Cloud Deployment Manager scripts.
- C. Migrate Nginx and Tomcat to App Engine. Deploy a Cloud Datastore server to replace the MySQL server in a high-availability configuration. Deploy Jenkins to Compute Engine using Cloud Launcher.
- D. Migrate Nginx and Tomcat to App Engine. Deploy a MySQL server using Cloud Launcher. Deploy Jenkins to Compute Engine using Cloud Launcher.

**Correct Answer:** A



**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 3**

For this question, refer to the Dress4Win case study. Which of the compute services should be migrated as-is and would still be an optimized architecture for performance in the cloud?

- A. Web applications deployed using App Engine standard environment
- B. RabbitMQ deployed using an unmanaged instance group
- C. Hadoop/Spark deployed using Cloud Dataproc Regional in High Availability mode
- D. Jenkins, monitoring, bastion hosts, security scanners services deployed on custom machine types

**Correct Answer: A**

**Section: (none)**

**Explanation**

**Explanation/Reference:**



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**QUESTION 4**

For this question, refer to the Dress4Win case study. To be legally compliant during an audit, Dress4Win must be able to give insights in all administrative actions that modify the configuration or metadata of resources on Google Cloud.

What should you do?

- A. Use Stackdriver Trace to create a Trace list analysis.
- B. Use Stackdriver Monitoring to create a dashboard on the project's activity.
- C. Enable Cloud Identity-Aware Proxy in all projects, and add the group of Administrators as a member.

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D. Use the Activity page in the GCP Console and Stackdriver Logging to provide the required insight.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 5

For this question, refer to the Dress4Win case study. You are responsible for the security of data stored in Cloud Storage for your company, Dress4Win. You have already created a set of Google Groups and assigned the appropriate users to those groups. You should use Google best practices and implement the simplest design to meet the requirements.

Considering Dress4Win's business and technical requirements, what should you do?

- A. Assign custom IAM roles to the Google Groups you created in order to enforce security requirements. Encrypt data with a customer-supplied encryption key when storing files in Cloud Storage.
- B. Assign custom IAM roles to the Google Groups you created in order to enforce security requirements. Enable default storage encryption before storing files in Cloud Storage.
- C. Assign predefined IAM roles to the Google Groups you created in order to enforce security requirements. Utilize Google's default encryption at rest when storing files in Cloud Storage.
- D. Assign predefined IAM roles to the Google Groups you created in order to enforce security requirements. Ensure that the default Cloud KMS key is set before storing files in Cloud Storage.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 6

For this question, refer to the Dress4Win case study. You want to ensure that your on-premises architecture meets business requirements before you migrate your solution.

What change in the on-premises architecture should you make?

- A. Replace RabbitMQ with Google Pub/Sub.
- B. Downgrade MySQL to v5.7, which is supported by Cloud SQL for MySQL.

- C. Resize compute resources to match predefined Compute Engine machine types.
- D. Containerize the micro-services and host them in Google Kubernetes Engine.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**



## Mix Questions

### Question Set 1

#### QUESTION 1

A recent audit revealed that a new network was created in your GCP project. In this network, a GCE instance has an SSH port open to the world. You want to discover this network's origin.

What should you do?

- A. Search for Create VM entry in the Stackdriver alerting console
- B. Navigate to the Activity page in the Home section. Set category to Data Access and search for Create VM entry
- C. In the Logging section of the console, specify GCE Network as the logging section. Search for the Create Insert entry
- D. Connect to the GCE instance using project SSH keys. Identify previous logins in system logs, and match these with the project owners list

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Incorrect Answers:

A: To use the Stackdriver alerting console we must first set up alerting policies.

B: Data access logs only contain read-only operations.

Audit logs help you determine who did what, where, and when.

Cloud Audit Logging returns two types of logs:

- Admin activity logs
- Data access logs: Contains log entries for operations that perform read-only operations do not modify any data, such as get, list, and aggregated list methods.

#### QUESTION 2

You want to make a copy of a production Linux virtual machine in the US-Central region. You want to manage and replace the copy easily if there are changes on the production virtual machine. You will deploy the copy as a new instance in a different project in the US-East region.

What steps must you take?

- A. Use the Linux dd and netcat commands to copy and stream the root disk contents to a new virtual machine instance in the US-East region.

- B. Create a snapshot of the root disk and select the snapshot as the root disk when you create a new virtual machine instance in the US-East region.
- C. Create an image file from the root disk with Linux dd command, create a new virtual machine instance in the US-East region
- D. Create a snapshot of the root disk, create an image file in Google Cloud Storage from the snapshot, and create a new virtual machine instance in the US-East region using the image file the root disk.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 3

Your company runs several databases on a single MySQL instance. They need to take backups of a specific database at regular intervals. The backup activity needs to complete as quickly as possible and cannot be allowed to impact disk performance.

How should you configure the storage?

- A. Configure a cron job to use the gcloud tool to take regular backups using persistent disk snapshots.
- B. Mount a Local SSD volume as the backup location. After the backup is complete, use gsutil to move the backup to Google Cloud Storage.
- C. Use gcsfuse to mount a Google Cloud Storage bucket as a volume directly on the instance and write backups to the mounted location using mysqldump.
- D. Mount additional persistent disk volumes onto each virtual machine (VM) instance in a RAID10 array and use LVM to create snapshots to send to Cloud Storage

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 4

You are helping the QA team to roll out a new load-testing tool to test the scalability of your primary cloud services that run on Google Compute Engine with Cloud Bigtable.

Which three requirements should they include? (Choose three.)

- A. Ensure that the load tests validate the performance of Cloud Bigtable
- B. Create a separate Google Cloud project to use for the load-testing environment

- C. Schedule the load-testing tool to regularly run against the production environment
- D. Ensure all third-party systems your services use is capable of handling high load
- E. Instrument the production services to record every transaction for replay by the load-testing tool
- F. Instrument the load-testing tool and the target services with detailed logging and metrics collection

**Correct Answer:** ABF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 5

One of your primary business objectives is being able to trust the data stored in your application. You want to log all changes to the application data.

How can you design your logging system to verify authenticity of your logs?

- A. Write the log concurrently in the cloud and on premises
- B. Use a SQL database and limit who can modify the log table
- C. Digitally sign each timestamp and log entry and store the signature
- D. Create a JSON dump of each log entry and store it in Google Cloud Storage

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 6

To reduce costs, the Director of Engineering has required all developers to move their development infrastructure resources from on-premises virtual machines (VMs) to Google Cloud Platform. These resources go through multiple start/stop events during the day and require state to persist. You have been asked to design the process of running a development environment in Google Cloud while providing cost visibility to the finance department.

Which two steps should you take? (Choose two.)

- A. Use the -no-auto-delete flag on all persistent disks and stop the VM
- B. Use the -auto-delete flag on all persistent disks and terminate the VM

- C. Apply VM CPU utilization label and include it in the BigQuery billing export
- D. Use Google BigQuery billing export and labels to associate cost to groups
- E. Store all state into local SSD, snapshot the persistent disks, and terminate the VM
- F. Store all state in Google Cloud Storage, snapshot the persistent disks, and terminate the VM

**Correct Answer:** AD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 7

Your company wants to track whether someone is present in a meeting room reserved for a scheduled meeting. There are 1000 meeting rooms across 5 offices on 3 continents. Each room is equipped with a motion sensor that reports its status every second. The data from the motion detector includes only a sensor ID and several different discrete items of information. Analysts will use this data, together with information about account owners and office locations.

Which database type should you use?

- A. Flat file
- B. NoSQL
- C. Relational
- D. Blobstore



**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Relational databases were not designed to cope with the scale and agility challenges that face modern applications, nor were they built to take advantage of the commodity storage and processing power available today. NoSQL fits well for:

- Developers are working with applications that create massive volumes of new, rapidly changing data types — structured, semi-structured, unstructured and polymorphic data.

Incorrect Answers:

D: The Blobstore API allows your application to serve data objects, called blobs, that are much larger than the size allowed for objects in the Datastore service. Blobs are useful for serving large files, such as video or image files, and for allowing users to upload large data files. Reference:

<https://www.mongodb.com/nosql-explained>

#### QUESTION 8

You write a Python script to connect to Google BigQuery from a Google Compute Engine virtual machine. The script is printing errors that it cannot connect to BigQuery.

What should you do to fix the script?

- A. Install the latest BigQuery API client library for Python
- B. Run your script on a new virtual machine with the BigQuery access scope enabled
- C. Create a new service account with BigQuery access and execute your script with that user
- D. Install the bq component for gcloud with the command `gcloud components install bq`.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### QUESTION 9

Your company has successfully migrated to the cloud and wants to analyze their data stream to optimize operations. They do not have any existing code for this analysis, so they are exploring all their options. These options include a mix of batch and stream processing, as they are running some hourly jobs and liveprocessing some data as it comes in.

Which technology should they use for this?

- A. Google Cloud Dataproc
- B. Google Cloud Dataflow
- C. Google Container Engine with Bigtable
- D. Google Compute Engine with Google BigQuery

**Correct Answer:** B

**Section:** (none)

**Explanation**



**Explanation/Reference:**

Explanation:

Cloud Dataflow is a fully-managed service for transforming and enriching data in stream (real time) and batch (historical) modes with equal reliability and expressiveness -- no more complex workarounds or compromises needed.

Reference: <https://cloud.google.com/dataflow/>

**QUESTION 10**

Your customer is receiving reports that their recently updated Google App Engine application is taking approximately 30 seconds to load for some of their users. This behavior was not reported before the update.

What strategy should you take?

- A. Work with your ISP to diagnose the problem
- B. Open a support ticket to ask for network capture and flow data to diagnose the problem, then roll back your application
- C. Roll back to an earlier known good release initially, then use Stackdriver Trace and Logging to diagnose the problem in a development/test/staging environment
- D. Roll back to an earlier known good release, then push the release again at a quieter period to investigate. Then use Stackdriver Trace and Logging to diagnose the problem

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Stackdriver Logging allows you to store, search, analyze, monitor, and alert on log data and events from Google Cloud Platform and Amazon Web Services (AWS). Our API also allows ingestion of any custom log data from any source. Stackdriver Logging is a fully managed service that performs at scale and can ingest application and system log data from thousands of VMs. Even better, you can analyze all that log data in real time. Reference:

<https://cloud.google.com/logging/>

**QUESTION 11**

A production database virtual machine on Google Compute Engine has an ext4-formatted persistent disk for data files. The database is about to run out of storage space.

How can you remediate the problem with the least amount of downtime?

- A. In the Cloud Platform Console, increase the size of the persistent disk and use the `resize2fs` command in Linux.



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- B. Shut down the virtual machine, use the Cloud Platform Console to increase the persistent disk size, then restart the virtual machine
- C. In the Cloud Platform Console, increase the size of the persistent disk and verify the new space is ready to use with the fdisk command in Linux
- D. In the Cloud Platform Console, create a new persistent disk attached to the virtual machine, format and mount it, and configure the database service to move the files to the new disk
- E. In the Cloud Platform Console, create a snapshot of the persistent disk restore the snapshot to a new larger disk, unmount the old disk, mount the new disk and restart the database service

**Correct Answer:** A

**Section:** (none)

**Explanation**



**Explanation/Reference:**

Explanation:

On Linux instances, connect to your instance and manually resize your partitions and file systems to use the additional disk space that you added.

Extend the file system on the disk or the partition to use the added space. If you grew a partition on your disk, specify the partition. If your disk does not have a partition table, specify only the disk ID.

sudo resize2fs /dev/[DISK\_ID][PARTITION\_NUMBER] where [DISK\_ID] is the device name and [PARTITION\_NUMBER] is the partition number for the device where you are resizing the file system. Reference: <https://cloud.google.com/compute/docs/disks/add-persistent-disk>

## QUESTION 12

Your application needs to process credit card transactions. You want the smallest scope of Payment Card Industry (PCI) compliance without compromising the ability to analyze transactional data and trends relating to which payment methods are used.

How should you design your architecture?

- A. Create a tokenizer service and store only tokenized data
- B. Create separate projects that only process credit card data

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- C. Create separate subnetworks and isolate the components that process credit card data
- D. Streamline the audit discovery phase by labeling all of the virtual machines (VMs) that process PCI data
- E. Enable Logging export to Google BigQuery and use ACLs and views to scope the data shared with the auditor

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference:

<https://www.sans.org/reading-room/whitepapers/compliance/ways-reduce-pci-dss-audit-scope-tokenizing-cardholder-data-33194>

### QUESTION 13

Your company is forecasting a sharp increase in the number and size of Apache Spark and Hadoop jobs being run on your local datacenter. You want to utilize the cloud to help you scale this upcoming demand with the least amount of operations work and code change.

Which product should you use?

- A. Google Cloud Dataflow
- B. Google Cloud Dataproc
- C. Google Compute Engine
- D. Google Kubernetes Engine



**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Google Cloud Dataproc is a fast, easy-to-use, low-cost and fully managed service that lets you run the Apache Spark and Apache Hadoop ecosystem on Google Cloud Platform. Cloud Dataproc provisions big or small clusters rapidly, supports many popular job types, and is integrated with other Google Cloud Platform services, such as Google Cloud Storage and Stackdriver Logging, thus helping you reduce TCO. Reference:

<https://cloud.google.com/dataproc/docs/resources/faq>

### QUESTION 14

The database administration team has asked you to help them improve the performance of their new database server running on Google Compute Engine. The database is for importing and normalizing their performance statistics and is built with MySQL running on Debian Linux. They have an n1-standard-8 virtual machine with 80 GB of SSD persistent disk.

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What should they change to get better performance from this system?

- A. Increase the virtual machine's memory to 64 GB
- B. Create a new virtual machine running PostgreSQL
- C. Dynamically resize the SSD persistent disk to 500 GB
- D. Migrate their performance metrics warehouse to BigQuery
- E. Modify all of their batch jobs to use bulk inserts into the database

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 15

You want to optimize the performance of an accurate, real-time, weather-charting application. The data comes from 50,000 sensors sending 10 readings a second, in the format of a timestamp and sensor reading.

Where should you store the data?

- A. Google BigQuery
- B. Google Cloud SQL
- C. Google Cloud Bigtable
- D. Google Cloud Storage

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Google Cloud Bigtable is a scalable, fully-managed NoSQL wide-column database that is suitable for both real-time access and analytics workloads.

Good for:

- Low-latency read/write access
- High-throughput analytics

- Native time series support
- Common workloads: ▪ IoT, finance, adtech
- Personalization, recommendations ▪ Monitoring
  - Geospatial datasets
  - Graphs

Reference: <https://cloud.google.com/storage-options/>

#### QUESTION 16

Your solution is producing performance bugs in production that you did not see in staging and test environments. You want to adjust your test and deployment procedures to avoid this problem in the future.

What should you do?

- A. Deploy fewer changes to production
- B. Deploy smaller changes to production
- C. Increase the load on your test and staging environments
- D. Deploy changes to a small subset of users before rolling out to production

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 17

You are designing a large distributed application with 30 microservices. Each of your distributed microservices needs to connect to a database back-end. You want to store the credentials securely.

Where should you store the credentials?

- A. In the source code
- B. In an environment variable
- C. In a secret management system
- D. In a config file that has restricted access through ACLs

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: <https://cloud.google.com/kms/docs/secret-management>

#### QUESTION 18

A lead engineer wrote a custom tool that deploys virtual machines in the legacy data center. He wants to migrate the custom tool to the new cloud environment. You want to advocate for the adoption of Google Cloud Deployment Manager.

What are two business risks of migrating to Cloud Deployment Manager? (Choose two.)

- A. Cloud Deployment Manager uses Python
- B. Cloud Deployment Manager APIs could be deprecated in the future
- C. Cloud Deployment Manager is unfamiliar to the company's engineers
- D. Cloud Deployment Manager requires a Google APIs service account to run
- E. Cloud Deployment Manager can be used to permanently delete cloud resources
- F. Cloud Deployment Manager only supports automation of Google Cloud resources

**Correct Answer:** BF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

#### QUESTION 19

A development manager is building a new application. He asks you to review his requirements and identify what cloud technologies he can use to meet them. The application must:

1. Be based on open-source technology for cloud portability
2. Dynamically scale compute capacity based on demand
3. Support continuous software delivery
4. Run multiple segregated copies of the same application stack
5. Deploy application bundles using dynamic templates
6. Route network traffic to specific services based on URL

Which combination of technologies will meet all of his requirements?

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- A. Google Kubernetes Engine, Jenkins, and Helm
- B. Google Kubernetes Engine and Cloud Load Balancing
- C. Google Kubernetes Engine and Cloud Deployment Manager
- D. Google Kubernetes Engine, Jenkins, and Cloud Load Balancing

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Jenkins is an open-source automation server that lets you flexibly orchestrate your build, test, and deployment pipelines. Kubernetes Engine is a hosted version of Kubernetes, a powerful cluster manager and orchestration system for containers.

When you need to set up a continuous delivery (CD) pipeline, deploying Jenkins on Kubernetes Engine provides important benefits over a standard VM-based deployment

Incorrect Answers:

A: Helm is a tool for managing Kubernetes charts. Charts are packages of pre-configured Kubernetes resources.

Use Helm to:

- Find and use popular software packaged as Kubernetes charts
- Share your own applications as Kubernetes charts
- Create reproducible builds of your Kubernetes applications
- Intelligently manage your Kubernetes manifest files
- Manage releases of Helm packages

Reference: <https://cloud.google.com/solutions/jenkins-on-kubernetes-engine>

## QUESTION 20

Your organization has a 3-tier web application deployed in the same network on Google Cloud Platform. Each tier (web, API, and database) scales independently of the others. Network traffic should flow through the web to the API tier and then on to the database tier. Traffic should not flow between the web and the database tier.

How should you configure the network?

- A. Add each tier to a different subnetwork
- B. Set up software based firewalls on individual VMs
- C. Add tags to each tier and set up routes to allow the desired traffic flow

D. Add tags to each tier and set up firewall rules to allow the desired traffic flow

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Google Cloud Platform(GCP) enforces firewall rules through rules and tags. GCP rules and tags can be defined once and used across all regions.

Reference: <https://cloud.google.com/docs/compare/openstack/> <https://aws.amazon.com/it/blogs/aws/building-three-tier-architectures-with-security-groups/>

### QUESTION 21

You created a pipeline that can deploy your source code changes to your infrastructure in instance groups for self-healing. One of the changes negatively affects your key performance indicator. You are not sure how to fix it, and investigation could take up to a week.

What should you do?

- A. Log in to a server, and iterate on the fix locally
- B. Revert the source code change, and rerun the deployment pipeline
- C. Log into the servers with the bad code change, and swap in the previous code
- D. Change the instance group template to the previous one, and delete all instances

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 22

Your customer support tool logs all email and chat conversations to Cloud Bigtable for retention and analysis. What is the recommended approach for sanitizing this data of personally identifiable information or payment card information before initial storage?

- A. Hash all data using SHA256
- B. Encrypt all data using elliptic curve cryptography
- C. De-identify the data with the Cloud Data Loss Prevention API
- D. Use regular expressions to find and redact phone numbers, email addresses, and credit card numbers



**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: [https://cloud.google.com/solutions/pci-dss-compliance-in-gcp#using\\_data\\_loss\\_prevention\\_api\\_to\\_sanitize\\_data](https://cloud.google.com/solutions/pci-dss-compliance-in-gcp#using_data_loss_prevention_api_to_sanitize_data)

#### QUESTION 23

You are analyzing and defining business processes to support your startup's trial usage of GCP, and you don't yet know what consumer demand for your product will be. Your manager requires you to minimize GCP service costs and adhere to Google best practices. What should you do?

- A. Utilize free tier and sustained use discounts. Provision a staff position for service cost management.
- B. Utilize free tier and sustained use discounts. Provide training to the team about service cost management.
- C. Utilize free tier and committed use discounts. Provision a staff position for service cost management.
- D. Utilize free tier and committed use discounts. Provide training to the team about service cost management.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### QUESTION 24

You are migrating your on-premises solution to Google Cloud in several phases. You will use Cloud VPN to maintain a connection between your on-premises systems and Google Cloud until the migration is completed. You want to make sure all your on-premise systems remain reachable during this period. How should you organize your networking in Google Cloud?

- A. Use the same IP range on Google Cloud as you use on-premises
- B. Use the same IP range on Google Cloud as you use on-premises for your primary IP range and use a secondary range that does not overlap with the range you use on-premises
- C. Use an IP range on Google Cloud that does not overlap with the range you use on-premises
- D. Use an IP range on Google Cloud that does not overlap with the range you use on-premises for your primary IP range and use a secondary range with the same IP range as you use on-premises

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 25**

You are deploying an application on App Engine that needs to integrate with an on-premises database. For security purposes, your on-premises database must not be accessible through the public internet. What should you do?

- A. Deploy your application on App Engine standard environment and use App Engine firewall rules to limit access to the open on-premises database.
- B. Deploy your application on App Engine standard environment and use Cloud VPN to limit access to the on-premises database.
- C. Deploy your application on App Engine flexible environment and use App Engine firewall rules to limit access to the on-premises database.
- D. Deploy your application on App Engine flexible environment and use Cloud VPN to limit access to the on-premises database.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 26**

You are working in a highly secured environment where public Internet access from the Compute Engine VMs is not allowed. You do not yet have a VPN connection to access an on-premises file server. You need to install specific software on a Compute Engine instance. How should you install the software?

- A. Upload the required installation files to Cloud Storage. Configure the VM on a subnet with a Private Google Access subnet. Assign only an internal IP address to the VM. Download the installation files to the VM using gsutil.
- B. Upload the required installation files to Cloud Storage and use firewall rules to block all traffic except the IP address range for Cloud Storage. Download the files to the VM using gsutil.
- C. Upload the required installation files to Cloud Source Repositories. Configure the VM on a subnet with a Private Google Access subnet. Assign only an internal IP address to the VM. Download the installation files to the VM using gcloud.
- D. Upload the required installation files to Cloud Source Repositories and use firewall rules to block all traffic except the IP address range for Cloud Source Repositories. Download the files to the VM using gsutil.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 27**

Your company is moving 75 TB of data into Google Cloud. You want to use Cloud Storage and follow Google-recommended practices. What should you do?

- A. Move your data onto a Transfer Appliance. Use a Transfer Appliance Rehydrator to decrypt the data into Cloud Storage.
- B. Move your data onto a Transfer Appliance. Use Cloud Dataprep to decrypt the data into Cloud Storage.
- C. Install gsutil on each server that contains data. Use resumable transfers to upload the data into Cloud Storage.
- D. Install gsutil on each server containing data. Use streaming transfers to upload the data into Cloud Storage.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 28**

You have an application deployed on Google Kubernetes Engine using a Deployment named echo-deployment. The deployment is exposed using a Service called echo-service. You need to perform an update to the application with minimal downtime to the application. What should you do?

- A. Use `kubectl set image deployment/echo-deployment <new-image>`
- B. Use the rolling update functionality of the Instance Group behind the Kubernetes cluster
- C. Update the deployment yaml file with the new container image. Use `kubectl delete deployment/echo-deployment` and `kubectl create -f <yaml-file>`
- D. Update the service yaml file with the new container image. Use `kubectl delete service/echo-service` and `kubectl create -f <yaml-file>`

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 29**

You have developed an application using Cloud ML Engine that recognizes famous paintings from uploaded images. You want to test the application and allow specific people to upload images for the next 24 hours. Not all users have a Google Account. How should you have users upload images?

- A. Have users upload the images to Cloud Storage. Protect the bucket with a password that expires after 24 hours.

- B. Have users upload the images to Cloud Storage using a signed URL that expires after 24 hours.
- C. Create an App Engine web application where users can upload images. Configure App Engine to disable the application after 24 hours. Authenticate users via Cloud Identity.
- D. Create an App Engine web application where users can upload images for the next 24 hours. Authenticate users via Cloud Identity.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 30

The development team has provided you with a Kubernetes Deployment file. You have no infrastructure yet and need to deploy the application. What should you do?

- A. Use gcloud to create a Kubernetes cluster. Use Deployment Manager to create the deployment.
- B. Use gcloud to create a Kubernetes cluster. Use kubectl to create the deployment.
- C. Use kubectl to create a Kubernetes cluster. Use Deployment Manager to create the deployment.
- D. Use kubectl to create a Kubernetes cluster. Use kubectl to create the deployment.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 31

You need to evaluate your team readiness for a new GCP project. You must perform the evaluation and create a skills gap plan which incorporates the business goal of cost optimization. Your team has deployed two GCP projects successfully to date. What should you do?

- A. Allocate budget for team training. Set a deadline for the new GCP project.
- B. Allocate budget for team training. Create a roadmap for your team to achieve Google Cloud certification based on job role.
- C. Allocate budget to hire skilled external consultants. Set a deadline for the new GCP project.
- D. Allocate budget to hire skilled external consultants. Create a roadmap for your team to achieve Google Cloud certification based on job role.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 32

You need to upload files from your on-premises environment to Cloud Storage. You want the files to be encrypted on Cloud Storage using customer-supplied encryption keys. What should you do?

- A. Supply the encryption key in a .boto configuration file. Use gsutil to upload the files.
- B. Supply the encryption key using gcloud config. Use gsutil to upload the files to that bucket.
- C. Use gsutil to upload the files, and use the flag --encryption-key to supply the encryption key.
- D. Use gsutil to create a bucket, and use the flag --encryption-key to supply the encryption key. Use gsutil to upload the files to that bucket.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 33

Your customer wants to capture multiple GBs of aggregate real-time key performance indicators (KPIs) from their game servers running on Google Cloud Platform and monitor the KPIs with low latency. How should they capture the KPIs?

- A. Store time-series data from the game servers in Google Bigtable, and view it using Google Data Studio.
- B. Output custom metrics to Stackdriver from the game servers, and create a Dashboard in Stackdriver Monitoring Console to view them.
- C. Schedule BigQuery load jobs to ingest analytics files uploaded to Cloud Storage every ten minutes, and visualize the results in Google Data Studio.
- D. Insert the KPIs into Cloud Datastore entities, and run ad hoc analysis and visualizations of them in Cloud Datalab.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: <https://cloud.google.com/solutions/data-lifecycle-cloud-platform>

### QUESTION 34

You have a Python web application with many dependencies that requires 0.1 CPU cores and 128 MB of memory to operate in production. You want to monitor and maximize machine utilization. You also want to reliably deploy new versions of the application. Which set of steps should you take?

- A. Perform the following:
  - 1. Create a managed instance group with f1-micro type machines.
  - 2. Use a startup script to clone the repository, check out the production branch, install the dependencies, and start the Python app.
  - 3. Restart the instances to automatically deploy new production releases.
- B. Perform the following:
  - 1. Create a managed instance group with n1-standard-1 type machines.
  - 2. Build a Compute Engine image from the production branch that contains all of the dependencies and automatically starts the Python app.
  - 3. Rebuild the Compute Engine image, and update the instance template to deploy new production releases.
- C. Perform the following:
  - 1. Create a Google Kubernetes Engine (GKE) cluster with n1-standard-1 type machines.
  - 2. Build a Docker image from the production branch with all of the dependencies, and tag it with the version number.
  - 3. Create a Kubernetes Deployment with the imagePullPolicy set to 'IfNotPresent' in the staging namespace, and then promote it to the production namespace after testing.
- D. Perform the following:
  - 1. Create a GKE cluster with n1-standard-4 type machines.
  - 2. Build a Docker image from the master branch with all of the dependencies, and tag it with 'latest'.
  - 3. Create a Kubernetes Deployment in the default namespace with the imagePullPolicy set to 'Always'. Restart the pods to automatically deploy new production releases.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 35

You are running a cluster on Kubernetes Engine (GKE) to serve a web application. Users are reporting that a specific part of the application is not responding anymore. You notice that all pods of your deployment keep restarting after 2 seconds. The application writes logs to standard output. You want to inspect the logs to find the cause of the issue. Which approach can you take?

- A. Review the Stackdriver logs for each Compute Engine instance that is serving as a node in the cluster.
- B. Review the Stackdriver logs for the specific GKE container that is serving the unresponsive part of the application.
- C. Connect to the cluster using gcloud credentials and connect to a container in one of the pods to read the logs.
- D. Review the Serial Port logs for each Compute Engine instance that is serving as a node in the cluster.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 36

Your web application has several VM instances running within a VPC. You want to restrict communications between instances to only the paths and ports you authorize, but you don't want to rely on static IP addresses or subnets because the app can autoscale. How should you restrict communications?

- A. Use separate VPCs to restrict traffic
- B. Use firewall rules based on network tags attached to the compute instances
- C. Use Cloud DNS and only allow connections from authorized hostnames
- D. Use service accounts and configure the web application to authorize particular service accounts to have access

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 37

You are using Cloud SQL as the database backend for a large CRM deployment. You want to scale as usage increases and ensure that you don't run out of storage, maintain 75% CPU usage cores, and keep replication lag below 60 seconds. What are the correct steps to meet your requirements?

- A.
  1. Enable automatic storage increase for the instance.
  2. Create a Stackdriver alert when CPU usage exceeds 75%, and change the instance type to reduce CPU usage.
  3. Create a Stackdriver alert for replication lag, and shard the database to reduce replication time.
- B.
  1. Enable automatic storage increase for the instance.
  2. Change the instance type to a 32-core machine type to keep CPU usage below 75%.
  3. Create a Stackdriver alert for replication lag, and deploy memcache to reduce load on the master.
- C.
  1. Create a Stackdriver alert when storage exceeds 75%, and increase the available storage on the instance to create more space.
  2. Deploy memcache to reduce CPU load.
  3. Change the instance type to a 32-core machine type to reduce replication lag.
- D.
  1. Create a Stackdriver alert when storage exceeds 75%, and increase the available storage on the instance to create more space.
  2. Deploy memcache to reduce CPU load.
  3. Create a Stackdriver alert for replication lag, and change the instance type to a 32-core machine type to reduce replication lag.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 38

You are tasked with building an online analytical processing (OLAP) marketing analytics and reporting tool. This requires a relational database that can operate on hundreds of terabytes of data. What is the Google-recommended tool for such applications?

- A. Cloud Spanner, because it is globally distributed
- B. Cloud SQL, because it is a fully managed relational database
- C. Cloud Firestore, because it offers real-time synchronization across devices
- D. BigQuery, because it is designed for large-scale processing of tabular data

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: <https://cloud.google.com/files/BigQueryTechnicalWP.pdf>

#### QUESTION 39

Your company pushes batches of sensitive transaction data from its application server VMs to Cloud Pub/Sub for processing and storage. What is the Google-recommended way for your application to authenticate to the required Google Cloud services?

- A. Ensure that VM service accounts are granted the appropriate Cloud Pub/Sub IAM roles.
- B. Ensure that VM service accounts do not have access to Cloud Pub/Sub, and use VM access scopes to grant the appropriate Cloud Pub/Sub IAM roles.
- C. Generate an OAuth2 access token for accessing Cloud Pub/Sub, encrypt it, and store it in Cloud Storage for access from each VM.
- D. Create a gateway to Cloud Pub/Sub using a Cloud Function, and grant the Cloud Function service account the appropriate Cloud Pub/Sub IAM roles.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 40



Your BigQuery project has several users. For audit purposes, you need to see how many queries each user ran in the last month. What should you do?

- A. Connect Google Data Studio to BigQuery. Create a dimension for the users and a metric for the amount of queries per user.
- B. In the BigQuery interface, execute a query on the JOBS table to get the required information.
- C. Use 'bq show' to list all jobs. Per job, use 'bq ls' to list job information and get the required information.
- D. Use Cloud Audit Logging to view Cloud Audit Logs, and create a filter on the query operation to get the required information.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 41

You want to automate the creation of a managed instance group. The VMs have many OS package dependencies. You want to minimize the startup time for new VMs in the instance group.

What should you do?

- A. Use Terraform to create the managed instance group and a startup script to install the OS package dependencies.
- B. Create a custom VM image with all OS package dependencies. Use Deployment Manager to create the managed instance group with the VM image.
- C. Use Puppet to create the managed instance group and install the OS package dependencies.
- D. Use Deployment Manager to create the managed instance group and Ansible to install the OS package dependencies.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 42

You have been engaged by your client to lead the migration of their application infrastructure to GCP. One of their current problems is that the on-premises high performance SAN is requiring frequent and expensive upgrades to keep up with the variety of workloads that are identified as follows: 20 TB of log archives retained for legal reasons; 500 GB of VM boot/data volumes and templates; 500 GB of image thumbnails; 200 GB of customer session state data that allows customers to restart sessions even if off-line for several days.

Which of the following best reflects your recommendations for a cost-effective storage allocation?

- A. Local SSD for customer session state data. Lifecycle-managed Cloud Storage for log archives, thumbnails, and VM boot/data volumes.
- B. Memcache backed by Cloud Datastore for the customer session state data. Lifecycle-managed Cloud Storage for log archives, thumbnails, and VM boot/data volumes.
- C. Memcache backed by Cloud SQL for customer session state data. Assorted local SSD-backed instances for VM boot/data volumes. Cloud Storage for log archives and thumbnails.
- D. Memcache backed by Persistent Disk SSD storage for customer session state data. Assorted local SSD-backed instances for VM boot/data volumes. Cloud Storage for log archives and thumbnails.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 43

Your architecture calls for the centralized collection of all admin activity and VM system logs within your project.

How should you collect these logs from both VMs and services?

- A. All admin and VM system logs are automatically collected by Stackdriver.
- B. Stackdriver automatically collects admin activity logs for most services. The Stackdriver Logging agent must be installed on each instance to collect system logs.
- C. Launch a custom syslogd compute instance and configure your GCP project and VMs to forward all logs to it.
- D. Install the Stackdriver Logging agent on a single compute instance and let it collect all audit and access logs for your environment.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 44

A development team at your company has created a dockerized HTTPS web application. You need to deploy the application on Google Kubernetes Engine (GKE) and make sure that the application scales automatically.

How should you deploy to GKE?

- A. Use the Horizontal Pod Autoscaler and enable cluster autoscaling. Use an Ingress resource to load-balance the HTTPS traffic.
- B. Use the Horizontal Pod Autoscaler and enable cluster autoscaling on the Kubernetes cluster. Use a Service resource of type LoadBalancer to load-balance the HTTPS traffic.
- C. Enable autoscaling on the Compute Engine instance group. Use an Ingress resource to load-balance the HTTPS traffic.
- D. Enable autoscaling on the Compute Engine instance group. Use a Service resource of type LoadBalancer to load-balance the HTTPS traffic.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: <https://cloud.google.com/kubernetes-engine/docs/how-to/cluster-autoscaler>

#### QUESTION 45

You have an application that makes HTTP requests to Cloud Storage. Occasionally the requests fail with HTTP status codes of 5xx and 429.

How should you handle these types of errors?

- A. Use gRPC instead of HTTP for better performance.
- B. Implement retry logic using a truncated exponential backoff strategy.
- C. Make sure the Cloud Storage bucket is multi-regional for geo-redundancy.
- D. Monitor <https://status.cloud.google.com/feed.atom> and only make requests if Cloud Storage is not reporting an incident.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: [https://cloud.google.com/storage/docs/json\\_api/v1/status-codes](https://cloud.google.com/storage/docs/json_api/v1/status-codes)

#### QUESTION 46

You need to develop procedures to test a disaster plan for a mission-critical application. You want to use Google-recommended practices and native capabilities within GCP.

What should you do?

- A. Use Deployment Manager to automate service provisioning. Use Activity Logs to monitor and debug your tests.

- B. Use Deployment Manager to automate service provisioning. Use Stackdriver to monitor and debug your tests.
- C. Use gcloud scripts to automate service provisioning. Use Activity Logs to monitor and debug your tests.
- D. Use gcloud scripts to automate service provisioning. Use Stackdriver to monitor and debug your tests.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 47

Your company acquired a healthcare startup and must retain its customers' medical information for up to 4 more years, depending on when it was created. Your corporate policy is to securely retain this data, and then delete it as soon as regulations allow.

Which approach should you take?

- A. Store the data in Google Drive and manually delete records as they expire.
- B. Anonymize the data using the Cloud Data Loss Prevention API and store it indefinitely.
- C. Store the data in Cloud Storage and use lifecycle management to delete files when they expire.
- D. Store the data in Cloud Storage and run a nightly batch script that deletes all expired data.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 48

Your company is building a new architecture to support its data-centric business focus. You are responsible for setting up the network. Your company's mobile and web-facing applications will be deployed on-premises, and all data analysis will be conducted in GCP. The plan is to process and load 7 years of archived .csv files totaling 900 TB of data and then continue loading 10 TB of data daily. You currently have an existing 100-MB internet connection.

What actions will meet your company's needs?

- A. Compress and upload both archived files and files uploaded daily using the `gsutil -m` option.
- B. Lease a Transfer Appliance, upload archived files to it, and send it to Google to transfer archived data to Cloud Storage. Establish a connection with Google using a Dedicated Interconnect or Direct Peering connection and use it to upload files daily.

- C. Lease a Transfer Appliance, upload archived files to it, and send it to Google to transfer archived data to Cloud Storage. Establish one Cloud VPN Tunnel to VPC networks over the public internet, and compress and upload files daily using the `gsutil -m` option.
- D. Lease a Transfer Appliance, upload archived files to it, and send it to Google to transfer archived data to Cloud Storage. Establish a Cloud VPN Tunnel to VPC networks over the public internet, and compress and upload files daily.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

