

**Exam : Google Certified Professional – Cloud Architect (GCP)**

**Total questions: 229 questions**

*EXAM A: 141 questions*

*EXAM B : 88 questions*

**EBAY: SURE-SUCCESS**

## Testlet 1

### Company Overview

Mountkirk Games makes online, session-based, multiplayer games for the most popular mobile platforms.

### Company Background

Mountkirk Games builds all of their games with some server-side integration and has historically used cloud providers to lease physical servers. A few of their games were more popular than expected, and they had problems scaling their application servers, MySQL databases, and analytics tools. Mountkirk's 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.

### 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 customized 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 games 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

For this question, refer to the Mountkirk Games case study.

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**

#### QUESTION 2

For this question, refer to the Mountkirk Games case study.

Mountkirk Games has deployed their new backend on Google Cloud Platform (GCP). You want to create a thorough 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: D**

#### QUESTION 3

For this question, refer to the Mountkirk Games case study.

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: D**

#### QUESTION 4

For this question, refer to the Mountkirk Games case study.

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. Container 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: C**

#### QUESTION 5

For this question, refer to the Mountkirk Games case study

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:** A

#### **QUESTION 6**

For this question, refer to the Mountkirk Games case study.

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 Container Registry, Google Container Engine, Google HTTP(s) Load Balancer
- D. Google Cloud Functions, Google Cloud Pub/Sub, Google Cloud Deployment Manager

**Correct Answer:** D

## Testlet 2

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 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.

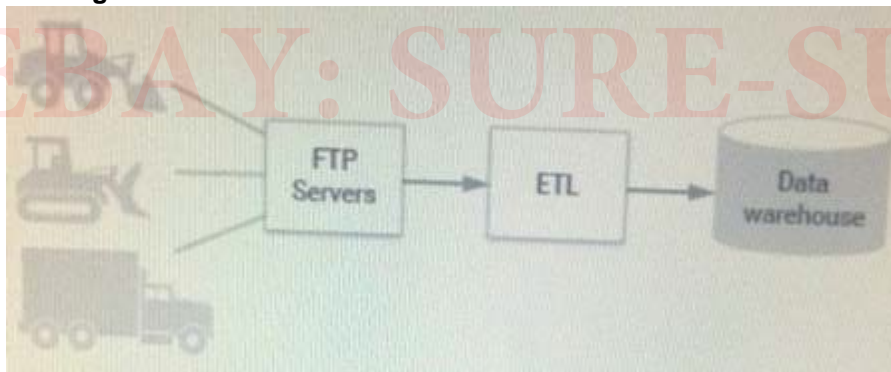
TerramEarth is proud of their ability to innovate on their core products and find new markets as their customers' needs change. For the past 20 years trends in the industry have been largely toward increasing productivity by using larger vehicles with a human operator.

### 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 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-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 IP 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 tower 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

For this question refer to the TerramEarth case study.

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: C**

#### QUESTION 2

For this question, refer to the TerramEarth case study.

TerramEarth has equipped unconnected 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: A**

#### QUESTION 3

For this question, refer to the TerramEarth case study.

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 regional bucket and use a Cloud Dataproc cluster ....

**Correct Answer: B**

#### QUESTION 4

For this question refer to the TerramEarth case study

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 your 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: D**

### QUESTION 5

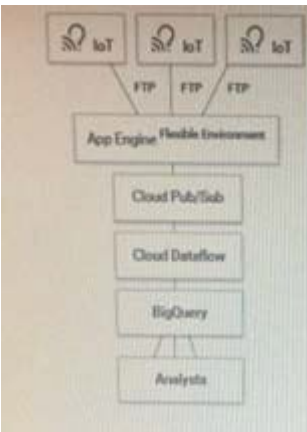
For this question, refer to the TerramEarth case study.

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.



C.



D.



**Correct Answer: D**

#### QUESTION 6

For this question, refer to the TerramEarth case study.

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: C**

#### QUESTION 7

For this question, refer to the TerramEarth case study.

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. 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: E**

#### **QUESTION 8**

For this question, refer to the TerramEarth case study.

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: B**

#### **QUESTION 9**

For this question, refer to the TerramEarth case study

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**

#### **QUESTION 10**

For this question, refer to the TerramEarth case study

You analyzed TerramEarth's business requirement to reduce downtime, and found that they can achieve a majority of time saving by reducing customers' 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: B**

### Testlet 3

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 32GB 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 application 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 prevents 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 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 and reduce costs.

#### **QUESTION 1**

For this question, refer to the JencoMart case study.

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 Container Engine (GKE) for the on-premises infrastructure and use GCP managed keys for the VMs.

**Correct Answer: A**

#### **QUESTION 2**

For this question, refer to the JencoMart case study.

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. 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: B**

#### **QUESTION 3**

For this question, refer to the JencoMart case study.

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: A**

#### QUESTION 4

For this question, refer to the JencoMart case study

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 3 answers

- 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:** ACD

#### QUESTION 5

For this question, refer to the JencoMart case study.

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?

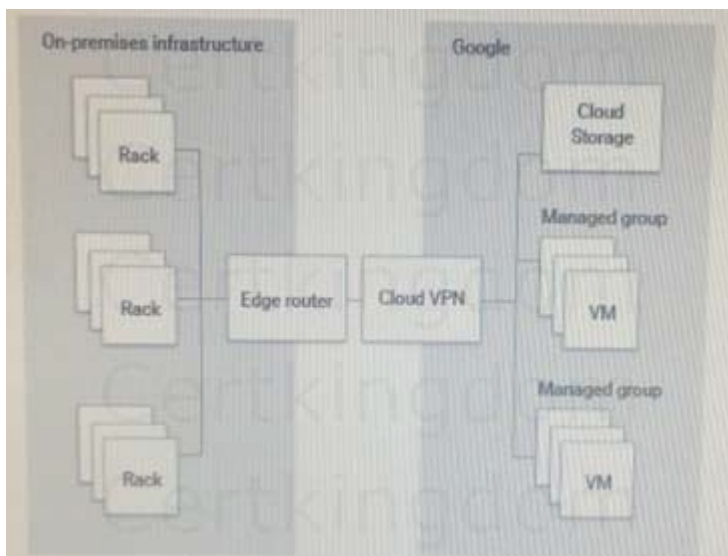
- A. Error rates for requests from Asia
- B. Latency difference between US and Asia
- C. Total visits, error rates, and latency from Asia
- D. Total visits and average latency for users in Asia
- E. The number of character sets present in the database

**Correct Answer:** B

#### QUESTION 6

For this question, refer to the JencoMart case study.

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 3 answers.)



- 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:** CDE

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## Testlet 4

### Topic 4, Dress4Win case study 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 freemium 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 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 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:
- ? Application servers:
- ? Storage appliances:
- ? Apache Hadoop/Spark servers:
- ? MQ servers:
- ? Miscellaneous servers: 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

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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**

For this question, refer to the Dress4Win case study.

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: C**

### **QUESTION 2**

Your company has decided to make a major revision of their API in order to create better experiences for their developers. They need to keep the old version of the API available and deployable, while allowing new customers and testers to try out the new API. They want to keep the same SSL and DNS records in place to serve both APIs. What should they do?

- A. Configure a new load balancer for the new version of the API.
- B. Reconfigure old clients to use a new endpoint for the new API.
- C. Have the old API forward traffic to the new API based on the path.
- D. Use separate backend pools for each API path behind the load balancer.

**Correct Answer: A**

### **QUESTION 3**

For this question, refer to the Dress4Win case study.

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**

### **QUESTION 4**

You have been asked to select the storage system for the click-data of your company's large portfolio of

websites. This data is streamed in from a custom website analytics package at a typical rate ,000 clicks per minute, with bursts of up to 8,500 clicks per second. It must be stored for future analysis by your data science and user experience teams. Which storage infrastructure should you choose?

- A. Google Cloud SQL
- B. Google Cloud Bigtable
- C. Google Cloud Storage
- D. Google cloud Datastore

**Correct Answer: D**

#### **QUESTION 5**

For this question, refer to the Dress4Win case study.

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**

#### **QUESTION 6**

Your customer is moving their corporate applications to Google Cloud Platform. The security team wants detailed visibility of all projects in the organization. You provision the Google Cloud Resource Manager and set up yourself as the org admin. What Google Cloud Identity and Access Management (Cloud IAM) roles should you give to the security team'?

- A. Org viewer, project owner
- B. Org viewer, project viewer
- C. Org admin, project browser
- D. Project owner, network admin

**Correct Answer: A**



## Question Set 1

### QUESTION 1

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 2 answers

- 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

### QUESTION 2

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.
- 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

### QUESTION 3

Your customer is moving an existing corporate application to Google Cloud Platform from an on-premises data center. The business owners require minimal user disruption. There are strict security team requirements for storing passwords.

What authentication strategy should they use?

- A. Use G Suite Password Sync to replicate passwords into Google.
- B. Federate authentication via SAML 2.0 to the existing Identity Provider.
- C. Provision users in Google using the Google Cloud Directory Sync tool.
- D. Ask users to set their Google password to match their corporate password.

**Correct Answer:** A

### QUESTION 4

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.
- 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**

#### QUESTION 5

For this question, refer to the Dress4Win case study.

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**

#### QUESTION 6

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**

#### QUESTION 7

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: D**

#### QUESTION 8

Your company's user-feedback portal comprises a standard LAMP stack replicated across two zones. It is deployed in the us-central1 region and uses autoscaled managed instance groups on all layers, except the database. Currently, only a small group of select customers have access to the portal. The portal meets a 99.99% availability SLA under these conditions. However next quarter, your company will be making the portal available to all users, including unauthenticated users. You need to develop a resiliency testing strategy to ensure the system maintains the SLA once they introduce additional user load. What should you do?

- A. Capture existing users input, and replay captured user load until autoscale is triggered on all layers. At the same time, terminate all resources in one of the zones.
- B. Create synthetic random user input, replay synthetic load until autoscale logic is triggered on at least one layer, and introduce "chaos" to the system by terminating random resources on both zones.
- C. Expose the new system to a larger group of users, and increase group ' size each day until autoscale logic is triggered on all layers. At the same time, terminate random resources on both zones.
- D. Capture existing users input, and replay captured user load until resource utilization crosses 80%. Also, derive estimated number of users based on existing users usage of the app, and deploy enough resources to handle 200% of expected load.

**Correct Answer: D**

#### QUESTION 9

For this question, refer to the Dress4Win case study.

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**

#### QUESTION 10

You set up an autoscaling instance group to serve web traffic for an upcoming launch. After configuring the instance group as a backend service to an HTTP(S) load balancer, you notice that virtual machine (VM) instances are being terminated and re-launched every minute. The instances do not have a public IP address. You have verified the appropriate web response is coming from each instance using the curl command. You want to ensure the backend is configured correctly. What should you do?

- A. Ensure that a firewall rule exists to allow source traffic on HTTP/HTTPS to reach the load balancer.
- B. Assign a public IP to each instance and configure a firewall rule to allow the load balancer to reach the instance public IP.
- C. Ensure that a firewall rule exists to allow load balancer health checks to reach the instances in the instance group.
- D. Create a tag on each instance with the name of the load balancer. Configure a firewall rule with the name of the load balancer as the source and the instance tag as the destination.

**Correct Answer: C**

#### QUESTION 11

The application reliability team at your company has added a debug feature to their backend service to send all server events to Google Cloud Storage for eventual analysis. The event records are at least 50 KB and at most 15 MB and are expected to peak at 3,000 events per second. You want to minimize data loss. Which process should you implement?

- A.
  - Append metadata to file body.
  - Compress individual files.
  - Name files with serverName-Timestamp.
  - Create a new bucket if bucket is older than 1 hour and save individual files to the new bucket. Otherwise, save files to existing bucket

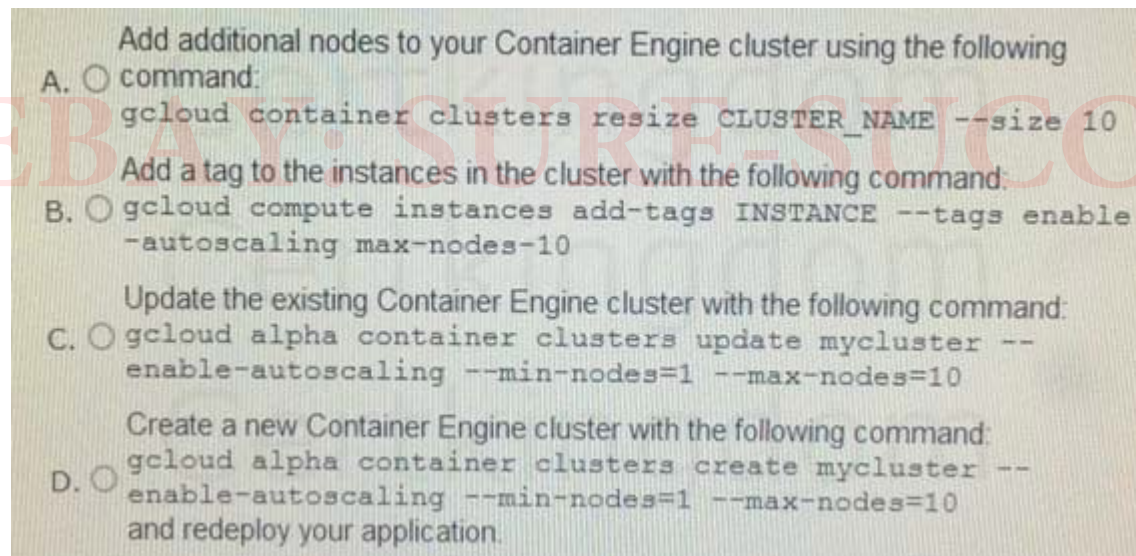
- B.
  - Batch every 10,000 events with a single manifest file for metadata.
  - Compress event files and manifest file into a single archive file.
  - Name files using serverName-EventSequence.
  - Create a new bucket if bucket is older than 1 day and save the single archive file to the new bucket. Otherwise, save the single archive file to existing bucket.
- C.
  - Compress individual files.
  - Name files with serverName-EventSequence.
  - Save files to one bucket
  - Set custom metadata headers for each object after saving.
- D.
  - Append metadata to file body.
  - Compress individual files.
  - Name files with a random prefix pattern.
  - Save files to one bucket

**Correct Answer:** A

### QUESTION 12

You want to enable your running Google Container Engine cluster to scale as demand for your application changes.

What should you do?



- A. Option A
- B. Option B
- C. Option C
- D. Option D

**Correct Answer:** A

### QUESTION 13

Your company's test suite is a custom C++ application that runs tests throughout each day on Linux virtual machines. The full test suite takes several hours to complete, running on a limited number of on premises servers reserved for testing. Your company wants to move the testing infrastructure to the cloud, to reduce the amount of time it takes to fully test a change to the system, while changing the tests as little as possible. Which cloud infrastructure should you recommend?

- A. Google Compute Engine unmanaged instance groups and Network Load Balancer
- B. Google Compute Engine managed instance groups with auto-scaling

- C. Google Cloud Dataproc to run Apache Hadoop jobs to process each test
- D. Google App Engine with Google Stackdriver for logging

**Correct Answer: C**

#### QUESTION 14

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 tier 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**

#### QUESTION 15

Auditors visit your teams every 12 months and ask to review all the Google Cloud Identity and Access Management (Cloud IAM) policy changes in the previous 12 months. You want to streamline and expedite the analysis and audit process. What should you do?

- A. Create custom Google Stackdriver alerts and send them to the auditor.
- B. Enable Logging export to Google BigQuery and use ACLs and views to scope the data shared with the auditor.
- C. Use cloud functions to transfer log entries to Google Cloud SQL and use ACLS and views to limit an auditor's view.
- D. Enable Google Cloud Storage (GCS) log export to audit logs into a GCS bucket and delegate access to the bucket.

**Correct Answer: B**

#### QUESTION 16

For this question, refer to the Dress4Win case study.

As part of their new application experience, Dress4Win 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**

#### QUESTION 17

The operations manager asks you for a list of recommended practices that she should consider when



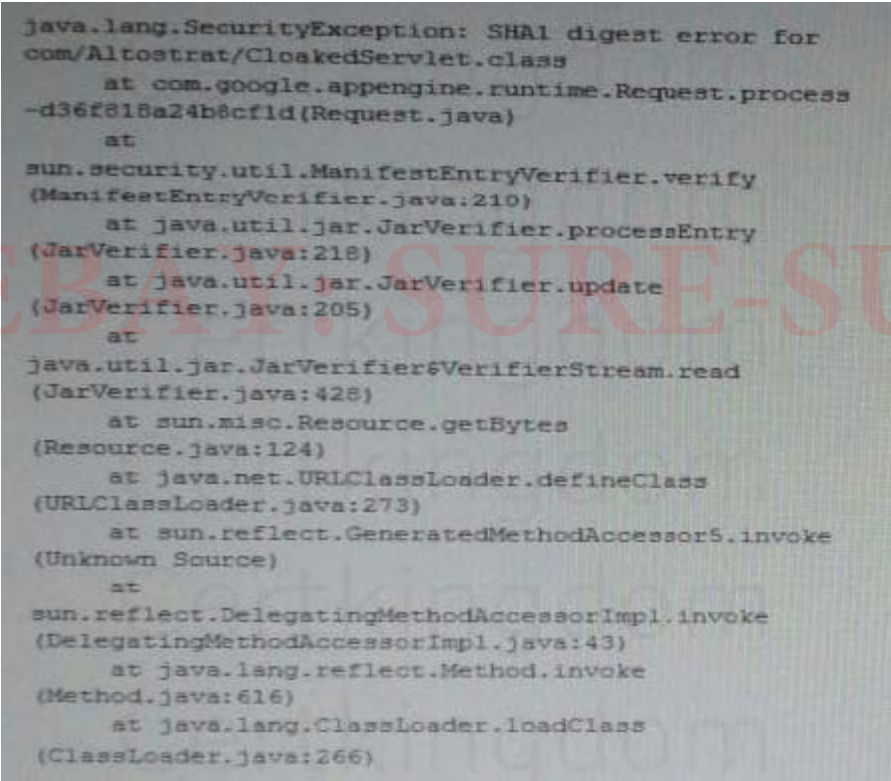
migrating a J2EE application to the cloud. Which three practices should you recommend? Choose 3 answers

- A. Port the application code to run on Google App Engine.
- B. Integrate Cloud Dataflow into the application to capture real-time metrics.
- C. Instrument the application with a monitoring tool like Stackdriver Debugger.
- D. Select an automation framework to reliably provision the cloud infrastructure.
- E. Deploy a continuous integration tool with automated testing in a staging environment.
- F. Migrate from MySQL to a managed NoSQL database like Google Cloud Datastore or Bigtable.

**Correct Answer:** BDF

#### QUESTION 18

You deploy your custom Java application to Google App Engine. It fails to deploy and gives you the following stack trace.



```
java.lang.SecurityException: SHA1 digest error for
com/Altostrat/CloakedServlet.class
    at com.google.appengine.runtime.Request.process
-d36f818a24b8cfd(Request.java)
    at
sun.security.util.ManifestEntryVerifier.verify
(ManifestEntryVerifier.java:210)
    at java.util.jar.JarVerifier.processEntry
(JarVerifier.java:218)
    at java.util.jar.JarVerifier.update
(JarVerifier.java:205)
    at
java.util.jar.JarVerifier$VerifierStream.read
(JarVerifier.java:428)
    at sun.misc.Resource.getBytes
(Resource.java:124)
    at java.net.URLClassLoader.defineClass
(URLClassLoader.java:273)
    at sun.reflect.GeneratedMethodAccessor5.invoke
(Unknown Source)
    at
sun.reflect.DelegatingMethodAccessorImpl.invoke
(DelegatingMethodAccessorImpl.java:43)
    at java.lang.reflect.Method.invoke
(Method.java:616)
    at java.lang.ClassLoader.loadClass
(ClassLoader.java:266)
```

What should you do?

- A. Upload missing JAR files and redeploy your application.
- B. Digitally sign all of your JAR files and redeploy your application

**Correct Answer:** B

#### QUESTION 19

For this question, refer to the Dress4Win case study.

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**

#### QUESTION 20

Your company's test suite is a custom C++ application that runs tests throughout each day on Linux virtual machines. The full test suite takes several hours to complete, running on a limited number of on premises servers reserved for testing. Your company wants to move the testing infrastructure to the cloud, to reduce the amount of time it takes to fully test a change to the system, while changing the tests as little as possible. Which cloud infrastructure should you recommend?

- A. Google Compute Engine unmanaged instance groups and Network Load Balancer
- B. Google Compute Engine managed instance groups with auto-scaling
- C. Google Cloud Dataproc to run Apache Hadoop jobs to process each test
- D. Google App Engine with Google stackdriver for logging

**Correct Answer: B**

#### QUESTION 21

Your company wants to try out the cloud with low risk. They want to archive approximately 100 TB of their log data to the cloud and test the analytics features available to them there, while also retaining that data as a long-term disaster recovery backup. Which two steps should they take? Choose 2 answers

- A. Load logs into Google BigQuery.
- B. Load logs into Google Cloud SQL.
- C. Import logs into Google Stackdriver.
- D. Insert logs into Google Cloud Bigtable.
- E. Upload log files into Google Cloud Storage.

**Correct Answer: AE**

#### QUESTION 22

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: C**

#### QUESTION 23

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 Container Engine

**Correct Answer:** D

#### QUESTION 24

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:** D

#### QUESTION 25

Your organization requires that metrics from all applications be retained for 5 years for future analysis in possible legal proceedings. Which approach should you use?

- A. Grant the security team access to the logs in each Project.
- B. Configure Stackdriver Monitoring for all Projects, and export to BigQuery.
- C. Configure Stackdriver Monitoring for all Projects with the default retention policies.
- D. Configure Stackdriver Monitoring for all Projects, and export to Google Cloud Storage.

**Correct Answer:** A

#### QUESTION 26

Your company places a high value on being responsive and meeting customer needs quickly. Their primary business objectives are release speed and agility. You want to reduce the chance of security errors being accidentally introduced.

Which two actions can you take? Choose 2 answers

- A. Ensure every code check-in is peer reviewed by a security SME.
- B. Use source code security analyzers as part of the CI/CD pipeline.
- C. Ensure you have stubs to unit test all interfaces between components.
- D. Enable code signing and a trusted binary repository integrated with your CI/CD pipeline.
- E. Run a vulnerability security scanner as part of your continuous-integration /continuous-delivery (CI/CD) pipeline.

**Correct Answer:** AC

#### QUESTION 27

During a high traffic portion of the day, one of your relational databases crashes, but the replica is never promoted to a master. You want to avoid this in the future. What should you do?

- A. Use a different database.
- B. Choose larger instances for your database.
- C. Create snapshots of your database more regularly.
- D. Implement routinely scheduled failovers of your databases.



**Correct Answer: D**

**QUESTION 28**

You are creating a solution to remove backup files older than 90 days from your backup Cloud Storage bucket. You want to optimize ongoing Cloud Storage spend. What should you do?

- A. Write a lifecycle management rule in XML and push it to the bucket with gsutil.
- B. Write a lifecycle management rule in JSON and push it to the bucket with gsutil.
- C. Schedule a cron script using gsutil ls -lr gs://backups/\*\* to find and remove items older than 90 days.
- D. Schedule a cron script using gsutil ls -l gs://backups/\*\* to find and remove items older than 90 days and schedule it with cron.

**Correct Answer: A**

**QUESTION 29**

A small number of API requests to your microservices-based application take a very long time. You know that each request to the API can traverse many services. You want to know which service takes the longest in those cases. What should you do?

- A. Set timeouts on your application so that you can fail requests faster.
- B. Send custom metrics for each of your requests to Stackdriver Monitoring.
- C. Use Stackdriver Monitoring to look for insights that show when your API latencies are high.
- D. Instrument your application with Stackdriver Trace in order to break down the request latencies at each microservice.

**Correct Answer: C**

**QUESTION 30**

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 instances in a different project in the US-East region. What steps must you take?

- A. Use the Linux dd and netcat command 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 disk from the image file, and use it to 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 for the root disk.

**Correct Answer: D**

**QUESTION 31**

You have created several preemptible Linux virtual machine instances using Google Compute Engine. You want to properly shut down your application before the virtual machines are preempted. What should you do?

- A. Create a shutdown script named k99.shutdown in the /etc/rc.6.d/ directory.
- B. Create a shutdown script registered as a xinetd service in Linux and configure a Stackdriver endpoint check to call the service.
- C. Create a shutdown script and use it as the value for a new metadata entry with the key shutdown-script in the Cloud Platform Console when you create the new virtual machine instance.
- D. Create a shutdown script, registered as a xinetd service in Linux, and use the gcloud compute instances add-metadata command to specify the service URL as the value for a new metadata entry with the key

shutdown-script-url

**Correct Answer:** A

**QUESTION 32**

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:** B

**QUESTION 33**

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:** B

**QUESTION 34**

Your company plans to migrate a multi-petabyte data set to the cloud. The data set must be available 24hrs a day. Your business analysts have experience only with using a SQL interface. How should you store the data to optimize it for ease of analysis?

- A. Load data into Google BigQuery.
- B. Insert data into Google Cloud SQL.
- C. Put flat files into Google Cloud Storage.
- D. Stream data into Google Cloud Datastore.

**Correct Answer:** C

**QUESTION 35**

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:** D

**QUESTION 36**

For this question, refer to the Dress4Win case study.

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: C**

**QUESTION 37**

For this question, refer to the Dress4Win case study.

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 engineers 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**

**QUESTION 38**

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 3 answers

- 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 are 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: ACF**

**QUESTION 39**

You need to reduce the number of unplanned rollbacks of erroneous production deployments in your company's web hosting platform. Improvement to the QA/Test processes accomplished an 80% reduction. Which additional two approaches can you take to further reduce the rollbacks? Choose 2 answers

- A. Introduce a green-blue deployment model.
- B. Replace the QA environment with canary releases.

- C. Fragment the monolithic platform into microservices.
- D. Reduce the platform's dependency on relational database systems.
- E. Replace the platform's relational database systems with a NoSQL database.

**Correct Answer:** DE

#### QUESTION 40

Your company has decided to build a backup replica of their on-premises user authentication PostgreSQL database on Google Cloud Platform. The database is 4 TB, and large updates are frequent. Replication requires private address space communication. Which networking approach should you use?

- A. Google Cloud Dedicated Interconnect
- B. Google Cloud VPN connected to the data center network
- C. A NAT and TLS translation gateway installed on-premises
- D. A Google Compute Engine instance with a VPN server installed connected to the data center network

**Correct Answer:** D

#### QUESTION 41

Your company just finished a rapid lift and shift to Google Compute Engine for your compute needs. You have another 9 months to design and deploy a more cloud-native solution. Specifically, you want a system that is no-ops and auto- scaling. Which two compute products should you choose? Choose 2 answers

- A. Compute Engine with containers
- B. Google Container Engine with containers
- C. Google App Engine Standard Environment
- D. Compute Engine with custom instance types
- E. Compute Engine with managed instance groups

**Correct Answer:** AD

#### QUESTION 42

Your marketing department wants to send out a promotional email campaign. The development team wants to minimize direct operation management. They project a wide range of possible customer responses, from 100 to 500,000 click- throughs per day. The link leads to a simple website that explains the promotion and collects user information and preferences. Which infrastructure should you recommend?

- A. Use Google App Engine to serve the website and Google Cloud Datastore to store user data.
- B. Use a Google Container Engine cluster to serve the website and store data to persistent disk.
- C. Use a managed instance group to serve the website and Google Cloud Bigtable to store user data.
- D. Use a single compute Engine virtual machine (VM) to host a web server, backed by Google Cloud SQL.

**Correct Answer:** D

#### QUESTION 43

For this question, refer to the Dress4Win case study.

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:** D

#### QUESTION 44

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 2 answers.

- 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:** AD

#### QUESTION 45

An application development team believes their current logging tool will not meet their needs for their new cloud-based product. They want a better tool to capture errors and help them analyze their historical log data. You want to help them find a solution that meets their needs, what should you do?

- A. Direct them to download and install the Google StackDriver logging agent.
- B. Send them a list of online resources about logging best practices.
- C. Help them define their requirements and assess viable logging tools.
- D. Help them upgrade their current tool to take advantage of any new features.

**Correct Answer:** D

#### QUESTION 46

One of the developers on your team deployed their application in Google Container Engine with the Dockerfile below.

They report that their application deployments are taking too long.

```
FROM ubuntu:16.04
COPY . /src
RUN apt-get update && apt-get install -y python python-pip
RUN pip install -r requirements.txt
```

You want to optimize this Dockerfile for faster deployment times without adversely affecting the app's functionality.

Which two actions should you take? Choose 2 answers.

- A. Remove Python after running pip.
- B. Remove dependencies from requirements.txt.
- C. Use a slimmed-down base image like Alpine Linux.
- D. Use larger machine types for your Google Container Engine node pools.

E. Copy the source after the package dependencies (Python and pip) are installed.

**Correct Answer:** AE

#### QUESTION 47

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:** A

#### QUESTION 48

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 live-processing 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

#### QUESTION 49

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?

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

**Correct Answer:** C

#### QUESTION 50

Your development team has installed a new Linux kernel module on the batch servers in Google Compute Engine (GCE) virtual machines (VMs) to speed up the nightly batch process. Two days after the installation, 50% of the batch servers failed the nightly batch run. You want to collect details on the failure to pass back to the development team. Which three actions should you take? Choose 3 answers

- A. Use Stackdriver Logging to search for the module log entries.
- B. Read the debug GCE Activity log using the API or Cloud Console.
- C. Use gcloud or Cloud Console to connect to the serial console and observe the logs.
- D. Identify whether a live migration event of the failed server occurred, using in the activity log.
- E. Adjust the Google Stackdriver timeline to match the failure time, and observe the batch server metrics.
- F. Export a debug VM into an image, and run the image on a local server where kernel log messages will be displayed on the native screen.

**Correct Answer:** ACE

### QUESTION 51

A news feed web service has the following code running on Google App Engine. During peak load, users report that they can see news articles they already viewed. What is the most likely cause of this problem?

```
import news
from flask import Flask, redirect, request
from flask.ext.api import status
from google.appengine.api import users

app = Flask(__name__)
sessions = {}

@app.route("/")
def homepage():
    user = users.get_current_user()
    if not user:
        return "Invalid login",
        status.HTTP_401_UNAUTHORIZED
    if user not in sessions:
        sessions[user] = { "viewed": [] }

    news_articles = news.get_new_news(user,
        sessions[user]["viewed"])
    sessions[user]["viewed"] += [n["id"] for n
        in news_articles]

    return news.render(news_articles)

if __name__ == "__main__":
    app.run()
```

- A. The session variable is local to just a single instance.
- B. The session variable is being overwritten in Cloud Datastore.
- C. The URL of the API needs to be modified to prevent caching.
- D. The HTTP Expires header needs to be set to -1 to stop caching.

**Correct Answer:** A

### QUESTION 52

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. 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**

**QUESTION 53**

A lead software engineer tells you that his new application design uses websockets and HTTP sessions that are not distributed across the web servers. You want to help him ensure his application will run properly on Google Cloud Platform. What should you do?

- A. Help the engineer to convert his websocket code to use HTTP streaming.
- B. Review the encryption requirements for websocket connections with the security team.
- C. Meet with the cloud operations team and the engineer to discuss load balancer options.
- D. Help the engineer redesign the application to use a distributed user session service that does not rely on websockets and HTTP sessions.

**Correct Answer: A**

**QUESTION 54**

Which of the following services provides real-time messaging?

- A. Cloud Pub/Sub
- B. Big Query
- C. App Engine
- D. Datastore

**Correct Answer: A**

**QUESTION 55**

Which of the following tasks would Nearline Storage be well suited for?

- A. A mounted Linux file system
- B. Image assets for a high traffic website
- C. Frequently read files
- D. Infrequently read data backups

**Correct Answer: D**

**QUESTION 56**

Which of the following products will allow you to administer your projects through a browser based command-line?

- A. Cloud Datastore
- B. Cloud Command-line
- C. Cloud Terminal
- D. Cloud Shell

**Correct Answer: D**

**QUESTION 57**

Cloud SQL is based on which database engine?

- A. Microsoft SQL Server
- B. MySQL
- C. Oracle
- D. Informix



**Correct Answer: B**

**QUESTION 58**

Which of the following products will allow you to perform live debugging without stopping your application?

- A. App Engine Active Debugger (AEAD)
- B. Stackdriver Debugger
- C. Code Inspector
- D. Pause IT

**Correct Answer: B**

**QUESTION 59**

Which of these options is not a valid Cloud Storage class?

- A. Glacier Storage
- B. Nearline Storage
- C. Coldline Storage
- D. Regional Storage

**Correct Answer: A**

**QUESTION 60**

Regarding Cloud Storage, which option allows any user to access to a Cloud Storage resource for a limited time, using a specific URL?

- A. Open Buckets
- B. Temporary Resources
- C. Signed URLs
- D. Temporary URLs

**Correct Answer: C**

**QUESTION 61**

Of the options given, which is a NoSQL database?

- A. Cloud Datastore
- B. Cloud SQL
- C. All of the given options
- D. Cloud Storage

**Correct Answer: A**

**QUESTION 62**

Container Engine allows orchestration of what type of containers?

- A. Blue Whale
- B. LXC
- C. BSD Jails
- D. Docker

**Correct Answer: D**

**QUESTION 63**

Regarding Cloud IAM, what type of role(s) are available?

- A. Basic roles and Compiled roles
- B. Primitive roles and Predefined roles
- C. Simple roles
- D. Basic roles and Curated roles

**Correct Answer:** B

**QUESTION 64**

Which of the follow products will allow you to host a static website?

- A. Cloud SDK
- B. Cloud Endpoints
- C. Cloud Storage
- D. Cloud Datastore

**Correct Answer:** C

**QUESTION 65**

Container Engine is built on which open source system?

- A. Swarm
- B. Kubernetes
- C. Docker Orchastrate
- D. Mesos

**Correct Answer:** B

**QUESTION 66**

Cloud Source Repositories provide a hosted version of which version control system?

- A. Git
- B. RCS
- C. SVN
- D. Mercurial

**Correct Answer:** A

**QUESTION 67**

Which of the following is an analytics data warehouse?

- A. Cloud SQL
- B. Big Query
- C. Datastore
- D. Cloud Storage

**Correct Answer:** B

**QUESTION 68**

Which service offers the ability to create and run virtual machines?

- A. Google Virtualization Engine
- B. Compute Containers
- C. VM Engine
- D. Compute Engine

**Correct Answer:** D

**QUESTION 69**

Which of the following is not helpful for mitigating the impact of an unexpected failure or reboot?

- A. Use persistent disks
- B. Configure tags and labels
- C. Use startup scripts to re-configure the system as needed
- D. Back up your data

**Correct Answer:** B

**QUESTION 70**

Single sign-on (SSO) with G Suite is based on\_\_\_\_\_?

- A. SAML2
- B. JWT
- C. Service accounts
- D. JSON

**Correct Answer:** A

**QUESTION 71**

Which tool allows you to sync data in your Google domain with Active Directory?

- A. Google Cloud Directory Sync (GCDS)
- B. Google Active Directory (GAD)
- C. Google Domain Sync Service
- D. Google LDAP Sync

**Correct Answer:** A

**QUESTION 72**

Regarding Cloud Storage: which of the following allows for time-limited access to buckets and objects without a Google account?

- A. Signed URLs
- B. gsutil
- C. Single sign-on
- D. Temporary Storage Accounts

**Correct Answer:** A

**QUESTION 73**

Which of the following is a virtual machine instance that can be terminated by Compute Engine without warning?

- A. A preemptible VM

- B. A shared-core VM
- C. A high-cpu VM
- D. A standard VM

**Correct Answer:** A

#### **QUESTION 74**

Regarding Compute Engine: What is a managed instance group?

- A. A managed instance group combines existing instances of different configurations into one manageable group
- B. A managed instance group uses an instance template to create identical instances
- C. A managed instance group creates a firewall around instances
- D. A managed instance group is a set of servers used exclusively for batch processing

**Correct Answer:** B

#### **QUESTION 75**

What type of firewall rule(s) does Google Cloud's networking support?

- A. deny
- B. allow, deny & filtered
- C. allow
- D. allow & deny

**Correct Answer:** D

#### **QUESTION 76**

How are subnetworks different than the legacy networks?

- A. They're the same, only the branding is different
- B. Each subnetwork controls the IP address range used for instances that are allocated to that subnetwork
- C. With subnetworks IP address allocation occurs at the global network level
- D. Legacy networks are the preferred way to create networks

**Correct Answer:** B

#### **QUESTION 77**

Which of the following is not a valid metric for triggering autoscaling?

- A. Google Cloud Pub/Sub queuing
- B. Average CPU utilization
- C. Stackdriver Monitoring metrics
- D. App Engine Task Queues

**Correct Answer:** D

#### **QUESTION 78**

Which of the following features makes applying firewall settings easier?

- A. Service accounts
- B. Tags
- C. Metadata

D. Labels

**Correct Answer: B**

**QUESTION 79**

What option does Cloud SQL offer to help with high availability?

- A. Point-in-time recovery
- B. The AlwaysOn setting
- C. Snapshots
- D. Failover replicas

**Correct Answer: D**

**QUESTION 80**

Regarding Compute Engine: when executing a startup script on a Linux server which user does the instance execute the script as?

- A. ubuntu
- B. The Google provided "gceinstance" user
- C. Whatever user you specify in the console
- D. root

**Correct Answer: D**

**QUESTION 81**

Which of the follow methods will not cause a shutdown script to be executed?

- A. When an instance shuts down through a request to the guest operating system
- B. A preemptible instance being terminated
- C. An instances.reset API call
- D. Shutting down via the cloud console

**Correct Answer: C**

**QUESTION 82**

Which type of account would you use in code when you want to interact with Google Cloud services?

- A. Google group
- B. Service account
- C. Code account
- D. Google account

**Correct Answer: B**

**QUESTION 83**

Which of the following is not an IAM best practice?

- A. Use primitive roles by default
- B. Treat each component of your application as a separate trust boundary
- C. Grant roles at the smallest scope needed
- D. Restrict who has access to create and manage service accounts in your project

**Correct Answer:** A

**QUESTION 84**

Which of the following would not reduce your recovery time in the event of a disaster?

- A. Make it as easy as possible to adjust the DNS record to cut over to your warm standby server.
- B. Replace your warm standby server with a hot standby server.
- C. Use a highly preconfigured machine image for deploying new instances.
- D. Replace your active/active hybrid production environment (on-premises and GCP) with a warm standby server.

**Correct Answer:** D

**QUESTION 85**

Which of the following is not a best practice for mitigating Denial of Service attacks on your Google Cloud infrastructure?

- A. Block SYN floods using Cloud Router
- B. Isolate your internal traffic from the external world
- C. Scale to absorb the attack
- D. Reduce the attack surface for your GCE deployment

**Correct Answer:** A

**QUESTION 86**

Which is the fastest instance storage option that will still be available when an instance is stopped?

- A. Local SSD
- B. Standard Persistent Disk
- C. SSD Persistent Disk
- D. RAM disk

**Correct Answer:** C

**QUESTION 87**

Which of these statements about Microsoft licenses is true?

- A. You can migrate your existing Microsoft application licenses to Compute Engine instances, but not your Microsoft Windows licenses.
- B. You can migrate your existing Microsoft Windows and Microsoft application licenses to Compute Engine instances.
- C. You cannot migrate your existing Microsoft Windows or Microsoft application licenses to Compute Engine instances.
- D. You can migrate your existing Microsoft Windows licenses to Compute Engine instances, but not your Microsoft application licenses.

**Correct Answer:** A

**QUESTION 88**

Which database services support standard SQL queries?

- A. Cloud Bigtable and Cloud SQL
- B. Cloud Spanner and Cloud SQL
- C. Cloud SQL and Cloud Datastore

D. Cloud SQL

**Correct Answer: B**

**QUESTION 89**

Which statement about IP addresses is false?

- A. You are charged for a static external IP address for every hour it is in use.
- B. You are not charged for ephemeral IP addresses.
- C. Google Cloud Engine supports only IPv4 addresses, not IPv6.
- D. You are charged for a static external IP address when it is assigned but unused.

**Correct Answer: D**

**QUESTION 90**

Which Google Cloud Platform service requires the least management because it takes care of the underlying infrastructure for you?

- A. Container Engine
- B. Cloud Engine
- C. App Engine
- D. Docker containers running on Cloud Engine

**Correct Answer: C**

**QUESTION 91**

To ensure that your application will handle the load even if an entire zone fails, what should you do?

- A. Don't select the "Multizone" option when creating your managed instance group.
- B. Spread your managed instance group over two zones and overprovision by 100%.
- C. Create a regional unmanaged instance group and spread your instances across multiple zones.
- D. Overprovision your regional managed instance group by at least 50%.

**Correct Answer: D**

**QUESTION 92**

If you do not grant a user named Bob permission to access a Cloud Storage bucket, but then use an ACL to grant access to an object inside that bucket to Bob, what will happen?

- A. Bob will be able to access all of the objects inside the bucket because he was granted access to at least one object in the bucket.
- B. Bob will be able to access the object because bucket and object ACLs are independent of each other.
- C. Bob will not be able to access the object because he does not have access to the bucket.
- D. It is not possible to grant access to an object when it is inside a bucket for which a user does not have access.

**Correct Answer: B**

**QUESTION 93**

To set up a virtual private network between your office network and Google Cloud Platform and have the routes automatically updated when the network topology changes, what is the minimal number of each type of component you need to implement?

- A. 2 Cloud VPN Gateways and 1 Peer Gateway

- B. 1 Cloud VPN Gateway, 1 Peer Gateway, and 1 Cloud Router
- C. 2 Peer Gateways and 1 Cloud Router
- D. 2 Cloud VPN Gateways and 1 Cloud Router

**Correct Answer:** B

#### **QUESTION 94**

Which of the following statements about encryption on GCP is not true?

- A. Google Cloud Platform encrypts customer data stored at rest by default.
- B. Each encryption key is itself encrypted with a set of master keys.
- C. If you want to manage your own encryption keys for data on Google Cloud Storage, the only option is Customer-Managed Encryption Keys (CMEK) using Cloud KMS.
- D. Data in Google Cloud Platform is broken into subfile chunks for storage, and each chunk is encrypted at the storage level with an individual encryption key.

**Correct Answer:** C

#### **QUESTION 95**

Which database service requires that you configure a failover replica to make it highly available?

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

**Correct Answer:** B

#### **QUESTION 96**

Which of these is not a principle you should apply when setting roles and permissions?

- A. Whenever possible, assign roles to groups instead of to individuals.
- B. Grant users the appropriate permissions to facilitate least privilege
- C. Whenever possible, assign primitive roles rather than predefined roles.
- D. Audit all policy changes by checking the Cloud Audit Logs.

**Correct Answer:** C

#### **QUESTION 97**

Which of these is not a recommended method of authenticating an application with a Google Cloud service?

- A. Use the gcloud and/or gsutil commands.
- B. Request an OAuth2 access token and use it directly.
- C. Embed the service account's credentials in the application's source code.
- D. Use one of the Google Cloud Client Libraries.

**Correct Answer:** C

#### **QUESTION 98**

What are two different features that fully isolate groups of VM instances?

- A. Firewall rules and subnetworks
- B. Networks and subnetworks



- C. Subnetworks and projects
- D. Projects and networks

**Correct Answer:** D

#### QUESTION 99

Suppose you have a web server that is working properly, but you can't connect to its instance VM over SSH. Which of these troubleshooting methods can you use without disrupting production traffic? (Select 3 answers.)

- A. Create a snapshot of the disk and use it to create a new disk; then attach the new disk to a new instance
- B. Use netcat to try to connect to port 22
- C. Access the serial console output
- D. Create a startup script to collect information.

**Correct Answer:** ABC

#### QUESTION 100

To configure Stackdriver to monitor a web server and let you know if it goes down, what steps do you need to take? (Select 2 answers.)

- A. Install the Stackdriver Logging Agent on the web server
- B. Create an alerting policy
- C. Install the Stackdriver Monitoring Agent on the web server
- D. Create an uptime check

**Correct Answer:** BD

#### QUESTION 101

Which of these tools can you use to copy data from AWS S3 to Cloud Storage? (Select 2 answers.)

- A. Cloud Storage Transfer Service
- B. S3 Storage Transfer Service
- C. Cloud Storage Console
- D. gsutil

**Correct Answer:** AD

#### QUESTION 102

What are two of the actions you can take to troubleshoot a virtual machine instance that won't start up at all? (Select 2 answers.)

- A. Increase the CPU and memory on the instance by changing the machine type.
- B. Validate that your disk has a valid file system.
- C. Examine your virtual machine instance's serial port output.
- D. Connect to your virtual machine instance using SSH.

**Correct Answer:** BC

#### QUESTION 103

Which statements about application load testing are true? (Select 2 answers.)

- A. You should test at the maximum load that you expect to encounter.
- B. You should test at 50% more than the maximum load that you expect to encounter.

- C. It is not necessary to test sudden increases in traffic since GCP scales seamlessly.
- D. Your load tests should include testing sudden increases in traffic.

**Correct Answer:** AD

#### **QUESTION 104**

Which of these statements about resilience testing are true? (Select 2 answers.)

- A. In a resilience test, your application should keep running with little or no downtime.
- B. To test the resilience of an autoscaling instance group, you can terminate a random instance within that group.
- C. In order for an application to survive instance failures, it should not be stateless.
- D. Resilience testing is the same as disaster recovery testing.

**Correct Answer:** AB

#### **QUESTION 105**

Which combination of Stackdriver services will alert you about errors generated by your applications and help you locate the root cause in the code?

- A. Monitoring, Trace, and Debugger
- B. Monitoring and Error Reporting
- C. Debugger and Error Reporting
- D. Alerts and Debugger

**Correct Answer:** C

#### **QUESTION 106**

If you have configured Stackdriver Logging to export logs to BigQuery, but logs entries are not getting exported to BigQuery, what is the most likely cause?

- A. The Cloud Data Transfer Service has not been enabled.
- B. There isn't a firewall rule allowing traffic between Stackdriver and BigQuery.
- C. Stackdriver Logging does not have permission to write to the BigQuery dataset.
- D. The size of the Stackdriver log entries being exported exceeds the maximum capacity of the BigQuery dataset.

**Correct Answer:** C

#### **QUESTION 107**

You can use Stackdriver to monitor virtual machines on which cloud platforms?

- A. Google Cloud Platform, Microsoft Azure
- B. Google Cloud Platform
- C. Google Cloud Platform, Microsoft Azure, Amazon Web Services
- D. Google Cloud Platform, Amazon Web Services

**Correct Answer:** D

#### **QUESTION 108**

To minimize the risk of someone changing your log files to hide their activities, which of the following principles would help? (Select 3 answers.)

- A. Restrict usage of the owner role for projects and log buckets.

- B. Require two people to inspect the logs.
- C. Implement object versioning on the log-buckets.
- D. Encrypt the logs using Cloud KMS.

**Correct Answer:** ABC

#### QUESTION 109

If network traffic between one Google Compute Engine instance and another instance is being dropped, what is the most likely cause?

- A. The instances are on a network with low bandwidth.
- B. The TCP keep-alive setting is too short.
- C. The instances are on a default network with no additional firewall rules.
- D. A firewall rule was deleted.

**Correct Answer:** D

#### QUESTION 110

Which of the following practices can help you develop more secure software? (Select 3 answers.)

- A. Penetration tests
- B. Integrating static code analysis tools into your CI/CD pipeline
- C. Encrypting your source code
- D. Peer review of code

**Correct Answer:** ABD

#### QUESTION 111

Which two places hold information you can use to monitor the effects of a Cloud Storage lifecycle policy on specific objects? (Select 2 answers.)

- A. Cloud Storage Lifecycle Monitoring
- B. Expiration time metadata
- C. Access logs
- D. Lifecycle config file

**Correct Answer:** BC

#### QUESTION 112

If you have object versioning enabled on a multi-regional bucket, what will the following lifecycle config file do?

```
{
  "lifecycle": {
    "rule": [ {
      "action": { "type": "Delete" },
      "condition": {
        "age": 30,
        "isLive": true } },
      { "action": {
        "type": "SetStorageClass",
        "storageClass": "COLDLINE" },
        "condition": {
          "age": 365,
          "matchesStorageClass": ["MULTI_REGIONAL"] } } ] } }
```

- A. Archive objects older than 30 days (the second rule doesn't do anything)

- B. Delete objects older than 30 days (the second rule doesn't do anything)
- C. Archive objects older than 30 days and move objects to Coldline Storage after 365 days
- D. Delete objects older than 30 days and move objects to Coldline Storage after 365 days

**Correct Answer:** C

### QUESTION 113

Which of the following statements about Stackdriver Trace are true? (Select 2 answers.)

- A. Stackdriver Trace tracks the performance of the virtual machines running the application.
- B. Stackdriver Trace tracks the latency of incoming requests.
- C. Applications in App Engine automatically submit traces to Stackdriver Trace. Applications outside of App Engine need to use the Trace SDK or Trace API.
- D. To make an application work with Stackdriver Trace, you need to add instrumentation code using the Trace SDK or Trace API, even if the application is in App Engine.

**Correct Answer:** BC

## **EXAM B: 88 questions**

### **Topic 1 - Testlet 1**

#### Question #1 *Topic 1*

Your company is planning to perform a lift and shift migration of their Linux RHEL 6.5+ virtual machines. The virtual machines are running in an on-premises VMware environment. You want to migrate them to Compute Engine following Google-recommended practices. What should you do?

- A. 1. Define a migration plan based on the list of the applications and their dependencies. 2. Migrate all virtual machines into Compute Engine individually with Migrate for Compute Engine.
- B. 1. Perform an assessment of virtual machines running in the current VMware environment. 2. Create images of all disks. Import disks on Compute Engine. 3. Create standard virtual machines where the boot disks are the ones you have imported.
- C. 1. Perform an assessment of virtual machines running in the current VMware environment. 2. Define a migration plan, prepare a Migrate for Compute Engine migration RunBook, and execute the migration.
- D. 1. Perform an assessment of virtual machines running in the current VMware environment. 2. Install a third-party agent on all selected virtual machines. 3. Migrate all virtual machines into Compute Engine.

**Correct Answer:** C

The framework illustrated in the preceding diagram has four phases:

✎ Assess. In this phase, you assess your source environment, assess the workloads that you want to migrate to Google Cloud, and assess which VMs support each workload.

✎ Plan. In this phase, you create the basic infrastructure for Migrate for Compute Engine, such as provisioning the resource hierarchy and setting up network access.

✎ Deploy. In this phase, you migrate the VMs from the source environment to Compute Engine.

✎ Optimize. In this phase, you begin to take advantage of the cloud technologies and capabilities.

Reference:

<https://cloud.google.com/architecture/migrating-vm#migrate-for-compute-engine-getting-started>

### Question #2 *Topic 1*

You need to deploy an application to Google Cloud. The application receives traffic via TCP and reads and writes data to the filesystem. The application does not support horizontal scaling. The application process requires full control over the data on the file system because concurrent access causes corruption. The business is willing to accept a downtime when an incident occurs, but the application must be available 24/7 to support their business operations. You need to design the architecture of this application on Google Cloud. What should you do?

- A. Use a managed instance group with instances in multiple zones, use Cloud Filestore, and use an HTTP load balancer in front of the instances.
- B. Use a managed instance group with instances in multiple zones, use Cloud Filestore, and use a network load balancer in front of the instances.
- C. Use an unmanaged instance group with an active and standby instance in different zones, use a regional persistent disk, and use an HTTP load balancer in front of the instances.
- D. Use an unmanaged instance group with an active and standby instance in different zones, use a regional persistent disk, and use a network load balancer in front of the instances.

**Correct Answer: D**

Reference:

<https://cloud.google.com/compute/docs/instance-groups>

### Question #3 *Topic 1*

Your company has an application running on multiple Compute Engine instances. You need to ensure that the application can communicate with an on-premises service that requires high throughput via internal IPs, while minimizing latency. What should you do?

- A. Use OpenVPN to configure a VPN tunnel between the on-premises environment and Google Cloud.
- B. Configure a direct peering connection between the on-premises environment and Google Cloud.
- C. Use Cloud VPN to configure a VPN tunnel between the on-premises environment and Google Cloud.
- D. Configure a Cloud Dedicated Interconnect connection between the on-premises environment and Google Cloud.

**Correct Answer: C**

Reference -

<https://cloud.google.com/architecture/setting-up-private-access-to-cloud-apis-through-vpn-tunnels>

### Question #4 *Topic 1*

You are managing an application deployed on Cloud Run for Anthos, and you need to define a strategy for deploying new versions of the application. You want to evaluate the new code with a subset of production traffic to decide whether to proceed with the rollout. What should you do?

- A. Deploy a new revision to Cloud Run with the new version. Configure traffic percentage between revisions.
- B. Deploy a new service to Cloud Run with the new version. Add a Cloud Load Balancing instance in front of both services.

- C. In the Google Cloud Console page for Cloud Run, set up continuous deployment using Cloud Build for the development branch. As part of the Cloud Build trigger, configure the substitution variable TRAFFIC\_PERCENTAGE with the percentage of traffic you want directed to a new version.
- D. In the Google Cloud Console, configure Traffic Director with a new Service that points to the new version of the application on Cloud Run. Configure Traffic Director to send a small percentage of traffic to the new version of the application.

**Correct Answer: C**

#### Question #5 Topic 1

You are monitoring Google Kubernetes Engine (GKE) clusters in a Cloud Monitoring workspace. As a Site Reliability Engineer (SRE), you need to triage incidents quickly. What should you do?

- A. Navigate the predefined dashboards in the Cloud Monitoring workspace, and then add metrics and create alert policies.
- B. Navigate the predefined dashboards in the Cloud Monitoring workspace, create custom metrics, and install alerting software on a Compute Engine instance.
- C. Write a shell script that gathers metrics from GKE nodes, publish these metrics to a Pub/Sub topic, export the data to BigQuery, and make a Data Studio dashboard.
- D. Create a custom dashboard in the Cloud Monitoring workspace for each incident, and then add metrics and create alert policies.

**Correct Answer: D**

Reference:

<https://cloud.google.com/monitoring/charts/dashboards>

#### Question #6 Topic 1

You need to deploy a stateful workload on Google Cloud. The workload can scale horizontally, but each instance needs to read and write to the same POSIX filesystem. At high load, the stateful workload needs to support up to 100 MB/s of writes. What should you do?

- A. Use a persistent disk for each instance.
- B. Use a regional persistent disk for each instance.
- C. Create a Cloud Filestore instance and mount it in each instance.
- D. Create a Cloud Storage bucket and mount it in each instance using gcsfuse.

**Correct Answer: D**

Reference:

<https://cloud.google.com/storage/docs/gcs-fuse>

#### Question #7 Topic 1

Your company has an application deployed on Anthos clusters (formerly Anthos GKE) that is running multiple microservices. The cluster has both Anthos Service Mesh and Anthos Config Management configured. End users inform you that the application is responding very slowly. You want to identify the microservice that is causing the delay. What should you do?

- A. Use the Service Mesh visualization in the Cloud Console to inspect the telemetry between the microservices.
- B. Use Anthos Config Management to create a ClusterSelector selecting the relevant cluster. On the Google Cloud Console page for Google Kubernetes Engine, view the Workloads and filter on the cluster. Inspect the configurations of the filtered workloads.
- C. Use Anthos Config Management to create a namespaceSelector selecting the relevant cluster namespace. On the Google Cloud Console page for Google Kubernetes Engine, visit the workloads and filter on the namespace. Inspect the configurations of the filtered workloads.
- D. Reinstall istio using the default istio profile in order to collect request latency. Evaluate the telemetry between the microservices in the Cloud Console.

**Correct Answer: A**

Question #8 Topic 1

You are working at a financial institution that stores mortgage loan approval documents on Cloud Storage. Any change to these approval documents must be uploaded as a separate approval file, so you want to ensure that these documents cannot be deleted or overwritten for the next 5 years. What should you do?

- A. Create a retention policy on the bucket for the duration of 5 years. Create a lock on the retention policy.
- B. Create the bucket with uniform bucket-level access, and grant a service account the role of Object Writer. Use the service account to upload new files.
- C. Use a customer-managed key for the encryption of the bucket. Rotate the key after 5 years.
- D. Create the bucket with fine-grained access control, and grant a service account the role of Object Writer. Use the service account to upload new files.

**Correct Answer: A**

Reference:

<https://cloud.google.com/storage/docs/using-bucket-lock>

Question #9 Topic 1

Your team will start developing a new application using microservices architecture on Kubernetes Engine. As part of the development lifecycle, any code change that has been pushed to the remote develop branch on your GitHub repository should be built and tested automatically. When the build and test are successful, the relevant microservice will be deployed automatically in the development environment. You want to ensure that all code deployed in the development environment follows this process. What should you do?

- A. Have each developer install a pre-commit hook on their workstation that tests the code and builds the container when committing on the development branch. After a successful commit, have the developer deploy the newly built container image on the development cluster.
- B. Install a post-commit hook on the remote git repository that tests the code and builds the container when code is pushed to the development branch. After a successful commit, have the developer deploy the newly built container image on the development cluster.



- C. Create a Cloud Build trigger based on the development branch that tests the code, builds the container, and stores it in Container Registry. Create a deployment pipeline that watches for new images and deploys the new image on the development cluster. Ensure only the deployment tool has access to deploy new versions.
- D. Create a Cloud Build trigger based on the development branch to build a new container image and store it in Container Registry. Rely on Vulnerability Scanning to ensure the code tests succeed. As the final step of the Cloud Build process, deploy the new container image on the development cluster. Ensure only Cloud Build has access to deploy new versions.

**Correct Answer: A**

#### Question #10 *Topic 1*

Your operations team has asked you to help diagnose a performance issue in a production application that runs on Compute Engine. The application is dropping requests that reach it when under heavy load. The process list for affected instances shows a single application process that is consuming all available CPU, and autoscaling has reached the upper limit of instances. There is no abnormal load on any other related systems, including the database. You want to allow production traffic to be served again as quickly as possible. Which action should you recommend?

- A. Change the autoscaling metric to agent.googleapis.com/memory/percent\_used.
- B. Restart the affected instances on a staggered schedule.
- C. SSH to each instance and restart the application process.
- D. Increase the maximum number of instances in the autoscaling group.

**Correct Answer: A**

Reference:

<https://cloud.google.com/blog/products/sap-google-cloud/best-practices-for-sap-app-server-autoscaling-on-google-cloud>

#### Question #11 *Topic 1*

You are implementing the infrastructure for a web service on Google Cloud. The web service needs to receive and store the data from 500,000 requests per second. The data will be queried later in real time, based on exact matches of a known set of attributes. There will be periods where the web service will not receive any requests. The business wants to keep costs low. Which web service platform and database should you use for the application?

- A. Cloud Run and BigQuery
- B. Cloud Run and Cloud Bigtable
- C. A Compute Engine autoscaling managed instance group and BigQuery
- D. A Compute Engine autoscaling managed instance group and Cloud Bigtable

**Correct Answer: D**

#### Question #12 *Topic 1*

You are developing an application using different microservices that should remain internal to the



cluster. You want to be able to configure each microservice with a specific number of replicas. You also want to be able to address a specific microservice from any other microservice in a uniform way, regardless of the number of replicas the microservice scales to. You need to implement this solution on Google Kubernetes Engine. What should you do?

- A. Deploy each microservice as a Deployment. Expose the Deployment in the cluster using a Service, and use the Service DNS name to address it from other microservices within the cluster.
- B. Deploy each microservice as a Deployment. Expose the Deployment in the cluster using an Ingress, and use the Ingress IP address to address the Deployment from other microservices within the cluster.
- C. Deploy each microservice as a Pod. Expose the Pod in the cluster using a Service, and use the Service DNS name to address the microservice from other microservices within the cluster.
- D. Deploy each microservice as a Pod. Expose the Pod in the cluster using an Ingress, and use the Ingress IP address name to address the Pod from other microservices within the cluster.

**Correct Answer: A**

Question #13 *Topic 1*

Your company has a networking team and a development team. The development team runs applications on Compute Engine instances that contain sensitive data. The development team requires administrative permissions for Compute Engine. Your company requires all network resources to be managed by the networking team. The development team does not want the networking team to have access to the sensitive data on the instances. What should you do?

- A. 1. Create a project with a standalone VPC and assign the Network Admin role to the networking team. 2. Create a second project with a standalone VPC and assign the Compute Admin role to the development team. 3. Use Cloud VPN to join the two VPCs.
- B. 1. Create a project with a standalone Virtual Private Cloud (VPC), assign the Network Admin role to the networking team, and assign the Compute Admin role to the development team.
- C. 1. Create a project with a Shared VPC and assign the Network Admin role to the networking team. 2. Create a second project without a VPC, configure it as a Shared VPC service project, and assign the Compute Admin role to the development team.
- D. 1. Create a project with a standalone VPC and assign the Network Admin role to the networking team. 2. Create a second project with a standalone VPC and assign the Compute Admin role to the development team. 3. Use VPC Peering to join the two VPCs.

**Correct Answer: C**

Reference:

<https://cloud.google.com/vpc/docs/shared-vpc>

Question #14 *Topic 1*

Your company wants you to build a highly reliable web application with a few public APIs as the backend. You don't expect a lot of user traffic, but traffic could spike occasionally. You want to leverage Cloud Load Balancing, and the solution must be cost-effective for users. What should you do?

- A. Store static content such as HTML and images in Cloud CDN. Host the APIs on App Engine and store the user data in Cloud SQL.
- B. Store static content such as HTML and images in a Cloud Storage bucket. Host the APIs on a zonal Google Kubernetes Engine cluster with worker nodes in multiple zones, and save the user data in Cloud Spanner.
- C. Store static content such as HTML and images in Cloud CDN. Use Cloud Run to host the APIs and save the user data in Cloud SQL.
- D. Store static content such as HTML and images in a Cloud Storage bucket. Use Cloud Functions to host the APIs and save the user data in Firestore.

**Correct Answer: B**

Question #15 *Topic 1*

Your company sends all Google Cloud logs to Cloud Logging. Your security team wants to monitor the logs. You want to ensure that the security team can react quickly if an anomaly such as an unwanted firewall change or server breach is detected. You want to follow Google-recommended practices. What should you do?

- A. Schedule a cron job with Cloud Scheduler. The scheduled job queries the logs every minute for the relevant events.
- B. Export logs to BigQuery, and trigger a query in BigQuery to process the log data for the relevant events.
- C. Export logs to a Pub/Sub topic, and trigger Cloud Function with the relevant log events.
- D. Export logs to a Cloud Storage bucket, and trigger Cloud Run with the relevant log events.

**Correct Answer: C**

Question #16 *Topic 1*

You have deployed several instances on Compute Engine. As a security requirement, instances cannot have a public IP address. There is no VPN connection between Google Cloud and your office, and you need to connect via SSH into a specific machine without violating the security requirements. What should you do?

- A. Configure Cloud NAT on the subnet where the instance is hosted. Create an SSH connection to the Cloud NAT IP address to reach the instance.
- B. Add all instances to an unmanaged instance group. Configure TCP Proxy Load Balancing with the instance group as a backend. Connect to the instance using the TCP Proxy IP.
- C. Configure Identity-Aware Proxy (IAP) for the instance and ensure that you have the role of IAP-secured Tunnel User. Use the gcloud command line tool to ssh into the instance.
- D. Create a bastion host in the network to SSH into the bastion host from your office location. From the bastion host, SSH into the desired instance.

**Correct Answer: D**

Reference:

<https://cloud.google.com/solutions/connecting-securely>

Question #17 *Topic 1*

Your company is using Google Cloud. You have two folders under the Organization: Finance and Shopping. The members of the development team are in a Google Group. The development team group has been assigned the Project Owner role on the Organization. You want to prevent the development team from creating resources in projects in the Finance folder. What should you do?

- A. Assign the development team group the Project Viewer role on the Finance folder, and assign the development team group the Project Owner role on the Shopping folder.
- B. Assign the development team group only the Project Viewer role on the Finance folder.
- C. Assign the development team group the Project Owner role on the Shopping folder, and remove the development team group Project Owner role from the Organization.
- D. Assign the development team group only the Project Owner role on the Shopping folder.

**Correct Answer: C**

Reference:

<https://cloud.google.com/resource-manager/docs/creating-managing-folders>

Question #18 *Topic 1*

You are developing your microservices application on Google Kubernetes Engine. During testing, you want to validate the behavior of your application in case a specific microservice should suddenly crash. What should you do?

- A. Add a taint to one of the nodes of the Kubernetes cluster. For the specific microservice, configure a pod anti-affinity label that has the name of the tainted node as a value.
- B. Use Istio's fault injection on the particular microservice whose faulty behavior you want to simulate.
- C. Destroy one of the nodes of the Kubernetes cluster to observe the behavior.
- D. Configure Istio's traffic management features to steer the traffic away from a crashing microservice.

**Correct Answer: C**

Question #19 *Topic 1*

Your company is developing a new application that will allow globally distributed users to upload pictures and share them with other selected users. The application will support millions of concurrent users. You want to allow developers to focus on just building code without having to create and maintain the underlying infrastructure. Which service should you use to deploy the application?

- A. App Engine
- B. Cloud Endpoints
- C. Compute Engine
- D. Google Kubernetes Engine

**Correct Answer: A**

Reference:

<https://cloud.google.com/terms/services>

Question #20 *Topic 1*

Your company provides a recommendation engine for retail customers. You are providing retail customers with an API where they can submit a user ID and the API returns a list of recommendations for that user. You are responsible for the API lifecycle and want to ensure stability for your customers in case the API makes backward-incompatible changes. You want to follow Google-recommended practices. What should you do?

- A. Create a distribution list of all customers to inform them of an upcoming backward-incompatible change at least one month before replacing the old API with the new API.
- B. Create an automated process to generate API documentation, and update the public API documentation as part of the CI/CD process when deploying an update to the API.
- C. Use a versioning strategy for the APIs that increases the version number on every backward-incompatible change.
- D. Use a versioning strategy for the APIs that adds the suffix `DEPRECATED` to the current API version number on every backward-incompatible change. Use the current version number for the new API.

**Correct Answer: A**

Question #21 *Topic 1*

Your company has developed a monolithic, 3-tier application to allow external users to upload and share files. The solution cannot be easily enhanced and lacks reliability. The development team would like to re-architect the application to adopt microservices and a fully managed service approach, but they need to convince their leadership that the effort is worthwhile. Which advantage(s) should they highlight to leadership?

- A. The new approach will be significantly less costly, make it easier to manage the underlying infrastructure, and automatically manage the CI/CD pipelines.
- B. The monolithic solution can be converted to a container with Docker. The generated container can then be deployed into a Kubernetes cluster.
- C. The new approach will make it easier to decouple infrastructure from application, develop and release new features, manage the underlying infrastructure, manage CI/CD pipelines and perform A/B testing, and scale the solution if necessary.
- D. The process can be automated with Migrate for Compute Engine.



**Correct Answer: C**

Question #22 *Topic 1*

Your team is developing a web application that will be deployed on Google Kubernetes Engine (GKE). Your CTO expects a successful launch and you need to ensure your application can handle

the expected load of tens of thousands of users. You want to test the current deployment to ensure the latency of your application stays below a certain threshold. What should you do?

- A. Use a load testing tool to simulate the expected number of concurrent users and total requests to your application, and inspect the results.
- B. Enable autoscaling on the GKE cluster and enable horizontal pod autoscaling on your application deployments. Send curl requests to your application, and validate if the auto scaling works.
- C. Replicate the application over multiple GKE clusters in every Google Cloud region. Configure a global HTTP(S) load balancer to expose the different clusters over a single global IP address.
- D. Use Cloud Debugger in the development environment to understand the latency between the different microservices.



**Correct Answer: B**

## Topic 2 - Testlet 1

Question #1 Topic 2

### Introductory Info 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 [a€greena€](#) 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** 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.

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**

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 Topic 2

**Introductory Info** Company Overview -

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Expand services into Asia

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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.

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#### 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** 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

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 browser-based 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 Topic 2

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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** 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**

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 *Topic 2*

### **Introductory Info** 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** 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**

From scenario:

Business Requirements include: Expand services into Asia

Technical Requirements include: Decrease latency in Asia

Question #5 *Topic 2*

### **Introductory Info** 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
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- Single-homed in US West
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- Backed up every 12 hours
- 100% uptime service level agreement (SLA)
- Authenticates all users

### Compute -

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- 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 -

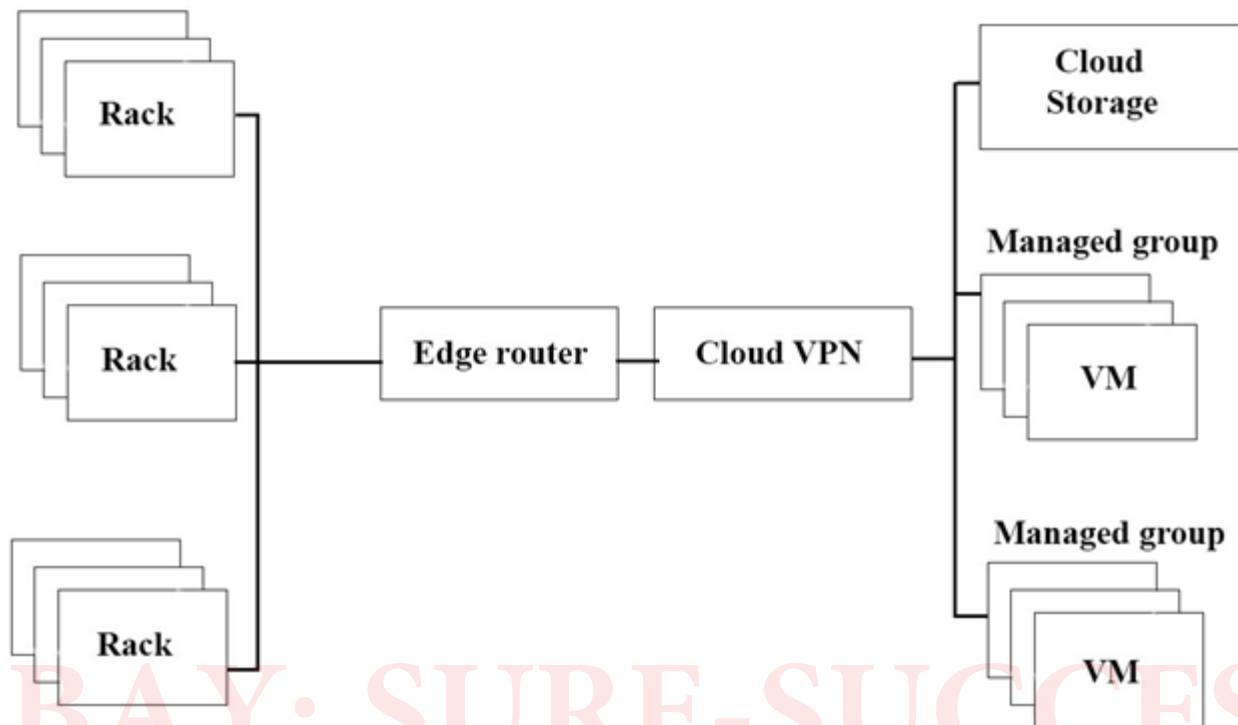
Since its founding, JencoMart has invested heavily in our data services infrastructure. However, because of changing market trends, we need to outsource our infrastructure to ensure our long-term success. This model will allow us to respond to increasing customer demand during peak periods and reduce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

#### **Question**



## On-premises infrastructure

## Google



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**

Question #6 Topic 2

### Introductory Info 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 -

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- Single-homed in US West
- No redundancy
- Backed up every 12 hours
- 100% uptime service level agreement (SLA)
- Authenticates all users

### Compute -

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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  $\lambda$ green $\lambda$ € 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** 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**

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>

**Topic 3 - Testlet 2**

Question #1 Topic 3

**Introductory Info** 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 as 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

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

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 Topic 3

### Introductory Info 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 as 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

1. Dynamically scale up or down based on game activity
2. Connect to a managed NoSQL database service
3. Run customized 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
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### CEO Statement -

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### 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** 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 λ€" for example, high, medium, and low



### Correct Answer: A

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 Topic 3

#### Introductory Info 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 λ€™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 λ€" 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** 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**

### Question #4 Topic 3

#### **Introductory Info** 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 as 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

1. Dynamically scale up or down based on game activity

2. Connect to a managed NoSQL database service

3. Run customized 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

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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** 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

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

Question #5 Topic 3

### Introductory Info Company Overview -

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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

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

#### Requirements for Game Analytics Platform

1. Dynamically scale up or down based on game activity
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### CEO Statement -

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### 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** 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**

Question #6 *Topic 3*

**Introductory Info** 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 -**

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**Technical Requirements -**

Requirements for Game Backend Platform

1. Dynamically scale up or down based on game activity

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Requirements for Game Analytics Platform

1. Dynamically scale up or down based on game activity

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#### CTO Statement -

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#### 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** 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

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/>

#### Topic 4 - Testlet 3

##### Question #1 Topic 4

#### Introductory Info 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 as 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** 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**

#### Question #2 Topic 4

##### **Introductory Info** 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** 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**

Question #3 *Topic 4*

**Introductory Info** 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 as 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** 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

Question #4 *Topic 4*

**Introductory Info** 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 as 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** 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**

Question #5 Topic 4

**Introductory Info** 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 -

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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** 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**

#### Question #6 Topic 4

##### Introductory Info 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 as 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** 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**

### Question #7 Topic 4

#### **Introductory Info** 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 as 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** 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**

## Topic 5 - Testlet 4

Question #1 *Topic 5*

### **Introductory Info** Company overview -

Mountkirk Games makes online, session-based, multiplayer games for mobile platforms. They have recently started expanding to other platforms after successfully migrating their on-premises environments to Google Cloud.

Their most recent endeavor is to create a retro-style first-person shooter (FPS) game that allows hundreds of simultaneous players to join a geo-specific digital arena from multiple platforms and locations. A real-time digital banner will display a global leaderboard of all the top players across every active arena.

### Solution concept -

Mountkirk Games is building a new multiplayer game that they expect to be very popular. They plan to deploy the game's backend on Google Kubernetes Engine so they can scale rapidly and use Google's global load balancer to route players to the closest regional game arenas. In order to keep the global leader board in sync, they plan to use a multi-region Spanner cluster.

### Existing technical environment -

The existing environment was recently migrated to Google Cloud, and five games came across using lift-and-shift virtual machine migrations, with a few minor exceptions. Each new game exists in an isolated Google Cloud project nested below a folder that maintains most of the permissions and network policies. Legacy games with low traffic have been consolidated into a single project. There are also separate environments for development and testing.

### Business requirements -

Support multiple gaming platforms.  
Support multiple regions.  
Support rapid iteration of game features.  
Minimize latency.  
Optimize for dynamic scaling.  
Use managed services and pooled resources.  
Minimize costs.

### Technical requirements -

Dynamically scale based on game activity.  
Publish scoring data on a near real-time global leaderboard.  
Store game activity logs in structured files for future analysis.  
Use GPU processing to render graphics server-side for multi-platform support.  
Support eventual migration of legacy games to this new platform.

### Executive statement -

Our last game was the first time we used Google Cloud, and it was a tremendous success. We were able to analyze player behavior and game telemetry in ways that we never could before. This success allowed us to bet on a full migration to the cloud and to start building all-new games using cloud-native design principles.

Our new game is our most ambitious to date and will open up doors for us to support more gaming

platforms beyond mobile. Latency is our top priority, although cost management is the next most important challenge. As with our first cloud-based game, we have grown to expect the cloud to enable advanced analytics capabilities so we can rapidly iterate on our deployments of bug fixes and new functionality. **Question** You need to optimize batch file transfers into Cloud Storage for Mountkirk Games's new Google Cloud solution. The batch files contain game statistics that need to be staged in Cloud Storage and be processed by an extract transform load (ETL) tool. What should you do?

- A. Use gsutil to batch move files in sequence.
- B. Use gsutil to batch copy the files in parallel.
- C. Use gsutil to extract the files as the first part of ETL.
- D. Use gsutil to load the files as the last part of ETL.



**Correct Answer: B**

Reference:

<https://cloud.google.com/storage/docs/gsutil/commands/cp>

Question #2 Topic 5

**Introductory Info** Company overview -

Mountkirk Games makes online, session-based, multiplayer games for mobile platforms. They have recently started expanding to other platforms after successfully migrating their on-premises environments to Google Cloud.

Their most recent endeavor is to create a retro-style first-person shooter (FPS) game that allows hundreds of simultaneous players to join a geo-specific digital arena from multiple platforms and locations. A real-time digital banner will display a global leaderboard of all the top players across every active arena.

**Solution concept -**

Mountkirk Games is building a new multiplayer game that they expect to be very popular. They plan to deploy the game's backend on Google Kubernetes Engine so they can scale rapidly and use Google's global load balancer to route players to the closest regional game arenas. In order to keep the global leader board in sync, they plan to use a multi-region Spanner cluster.

**Existing technical environment -**

The existing environment was recently migrated to Google Cloud, and five games came across using lift-and-shift virtual machine migrations, with a few minor exceptions. Each new game exists in an isolated Google Cloud project nested below a folder that maintains most of the permissions and network policies. Legacy games with low traffic have been consolidated into a single project. There are also separate environments for development and testing.

**Business requirements -**

- Support multiple gaming platforms.
- Support multiple regions.
- Support rapid iteration of game features.
- Minimize latency.
- Optimize for dynamic scaling.
- Use managed services and pooled resources.
- Minimize costs.

**Technical requirements -**

Dynamically scale based on game activity.

Publish scoring data on a near real-time global leaderboard.

Store game activity logs in structured files for future analysis.

Use GPU processing to render graphics server-side for multi-platform support.

Support eventual migration of legacy games to this new platform.

Executive statement -

Our last game was the first time we used Google Cloud, and it was a tremendous success. We were able to analyze player behavior and game telemetry in ways that we never could before. This success allowed us to bet on a full migration to the cloud and to start building all-new games using cloud-native design principles.

Our new game is our most ambitious to date and will open up doors for us to support more gaming platforms beyond mobile. Latency is our top priority, although cost management is the next most important challenge. As with our first cloud-based game, we have grown to expect the cloud to enable advanced analytics capabilities so we can rapidly iterate on our deployments of bug fixes and new functionality.**Question**You are implementing Firestore for Mountkirk Games. Mountkirk Games wants to give a new game programmatic access to a legacy game's Firestore database. Access should be as restricted as possible. What should you do?

- A. Create a service account (SA) in the legacy game's Google Cloud project, add a second SA in the new game's IAM page, and then give the Organization Admin role to both SAs.
- B. Create a service account (SA) in the legacy game's Google Cloud project, give the SA the Organization Admin role, and then give it the Firebase Admin role in both projects.
- C. Create a service account (SA) in the legacy game's Google Cloud project, add this SA in the new game's IAM page, and then give it the Firebase Admin role in both projects.
- D. Create a service account (SA) in the legacy game's Google Cloud project, give it the Firebase Admin role, and then migrate the new game to the legacy game's project.



**Correct Answer: C**

Question #3 *Topic 5*

**Introductory Info**Company overview -

Mountkirk Games makes online, session-based, multiplayer games for mobile platforms. They have recently started expanding to other platforms after successfully migrating their on-premises environments to Google Cloud.

Their most recent endeavor is to create a retro-style first-person shooter (FPS) game that allows hundreds of simultaneous players to join a geo-specific digital arena from multiple platforms and locations. A real-time digital banner will display a global leaderboard of all the top players across every active arena.

Solution concept -

Mountkirk Games is building a new multiplayer game that they expect to be very popular. They plan to deploy the game's backend on Google Kubernetes Engine so they can scale rapidly and use Google's global load balancer to route players to the closest regional game arenas. In order to keep the global leader board in sync, they plan to use a multi-region Spanner cluster.

Existing technical environment -

The existing environment was recently migrated to Google Cloud, and five games came across

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using lift-and-shift virtual machine migrations, with a few minor exceptions. Each new game exists in an isolated Google Cloud project nested below a folder that maintains most of the permissions and network policies. Legacy games with low traffic have been consolidated into a single project. There are also separate environments for development and testing.

Business requirements -

- Support multiple gaming platforms.
- Support multiple regions.
- Support rapid iteration of game features.
- Minimize latency.
- Optimize for dynamic scaling.
- Use managed services and pooled resources.
- Minimize costs.

Technical requirements -

- Dynamically scale based on game activity.
- Publish scoring data on a near real-time global leaderboard.
- Store game activity logs in structured files for future analysis.
- Use GPU processing to render graphics server-side for multi-platform support.
- Support eventual migration of legacy games to this new platform.

Executive statement -

Our last game was the first time we used Google Cloud, and it was a tremendous success. We were able to analyze player behavior and game telemetry in ways that we never could before. This success allowed us to bet on a full migration to the cloud and to start building all-new games using cloud-native design principles.

Our new game is our most ambitious to date and will open up doors for us to support more gaming platforms beyond mobile. Latency is our top priority, although cost management is the next most important challenge. As with our first cloud-based game, we have grown to expect the cloud to enable advanced analytics capabilities so we can rapidly iterate on our deployments of bug fixes and new functionality. **Question** Mountkirk Games wants to limit the physical location of resources to their operating Google Cloud regions. What should you do?

- A. Configure an organizational policy which constrains where resources can be deployed.
- B. Configure IAM conditions to limit what resources can be configured.
- C. Configure the quotas for resources in the regions not being used to 0.
- D. Configure a custom alert in Cloud Monitoring so you can disable resources as they are created in other regions.



**Correct Answer: C**

Question #4 *Topic 5*

**Introductory Info** Company overview -

Mountkirk Games makes online, session-based, multiplayer games for mobile platforms. They have recently started expanding to other platforms after successfully migrating their on-premises environments to Google Cloud.

Their most recent endeavor is to create a retro-style first-person shooter (FPS) game that allows hundreds of simultaneous players to join a geo-specific digital arena from multiple platforms and locations. A real-time digital banner will display a global leaderboard of all the top players across



every active arena.

#### Solution concept -

Mountkirk Games is building a new multiplayer game that they expect to be very popular. They plan to deploy the game's backend on Google Kubernetes Engine so they can scale rapidly and use Google's global load balancer to route players to the closest regional game arenas. In order to keep the global leader board in sync, they plan to use a multi-region Spanner cluster.

#### Existing technical environment -

The existing environment was recently migrated to Google Cloud, and five games came across using lift-and-shift virtual machine migrations, with a few minor exceptions. Each new game exists in an isolated Google Cloud project nested below a folder that maintains most of the permissions and network policies. Legacy games with low traffic have been consolidated into a single project. There are also separate environments for development and testing.

#### Business requirements -

Support multiple gaming platforms.  
Support multiple regions.  
Support rapid iteration of game features.  
Minimize latency.  
Optimize for dynamic scaling.  
Use managed services and pooled resources.  
Minimize costs.

#### Technical requirements -

Dynamically scale based on game activity.  
Publish scoring data on a near real-time global leaderboard.  
Store game activity logs in structured files for future analysis.  
Use GPU processing to render graphics server-side for multi-platform support.  
Support eventual migration of legacy games to this new platform.

#### Executive statement -

Our last game was the first time we used Google Cloud, and it was a tremendous success. We were able to analyze player behavior and game telemetry in ways that we never could before. This success allowed us to bet on a full migration to the cloud and to start building all-new games using cloud-native design principles.

Our new game is our most ambitious to date and will open up doors for us to support more gaming platforms beyond mobile. Latency is our top priority, although cost management is the next most important challenge. As with our first cloud-based game, we have grown to expect the cloud to enable advanced analytics capabilities so we can rapidly iterate on our deployments of bug fixes and new functionality. **Question** You need to implement a network ingress for a new game that meets the defined business and technical requirements. Mountkirk Games wants each regional game instance to be located in multiple Google Cloud regions. What should you do?

- A. Configure a global load balancer connected to a managed instance group running Compute Engine instances.
- B. Configure kubemci with a global load balancer and Google Kubernetes Engine.
- C. Configure a global load balancer with Google Kubernetes Engine.
- D. Configure Ingress for Anthos with a global load balancer and Google Kubernetes Engine.



**Correct Answer: A**

Question #5 *Topic 5*

**Introductory Info** Company overview -

Mountkirk Games makes online, session-based, multiplayer games for mobile platforms. They have recently started expanding to other platforms after successfully migrating their on-premises environments to Google Cloud.

Their most recent endeavor is to create a retro-style first-person shooter (FPS) game that allows hundreds of simultaneous players to join a geo-specific digital arena from multiple platforms and locations. A real-time digital banner will display a global leaderboard of all the top players across every active arena.

Solution concept -

Mountkirk Games is building a new multiplayer game that they expect to be very popular. They plan to deploy the game's backend on Google Kubernetes Engine so they can scale rapidly and use Google's global load balancer to route players to the closest regional game arenas. In order to keep the global leader board in sync, they plan to use a multi-region Spanner cluster.

Existing technical environment -

The existing environment was recently migrated to Google Cloud, and five games came across using lift-and-shift virtual machine migrations, with a few minor exceptions. Each new game exists in an isolated Google Cloud project nested below a folder that maintains most of the permissions and network policies. Legacy games with low traffic have been consolidated into a single project. There are also separate environments for development and testing.

Business requirements -

- Support multiple gaming platforms.
- Support multiple regions.
- Support rapid iteration of game features.
- Minimize latency.
- Optimize for dynamic scaling.
- Use managed services and pooled resources.
- Minimize costs.

Technical requirements -

- Dynamically scale based on game activity.
- Publish scoring data on a near real-time global leaderboard.
- Store game activity logs in structured files for future analysis.
- Use GPU processing to render graphics server-side for multi-platform support.
- Support eventual migration of legacy games to this new platform.

Executive statement -

Our last game was the first time we used Google Cloud, and it was a tremendous success. We were able to analyze player behavior and game telemetry in ways that we never could before. This success allowed us to bet on a full migration to the cloud and to start building all-new games using cloud-native design principles.

Our new game is our most ambitious to date and will open up doors for us to support more gaming platforms beyond mobile. Latency is our top priority, although cost management is the next most important challenge. As with our first cloud-based game, we have grown to expect the cloud to enable advanced analytics capabilities so we can rapidly iterate on our deployments of bug fixes

and new functionality. **Question** Your development teams release new versions of games running on Google Kubernetes Engine (GKE) daily. You want to create service level indicators (SLIs) to evaluate the quality of the new versions from the user's perspective. What should you do?

- A. Create CPU Utilization and Request Latency as service level indicators.
- B. Create GKE CPU Utilization and Memory Utilization as service level indicators.
- C. Create Request Latency and Error Rate as service level indicators.
- D. Create Server Uptime and Error Rate as service level indicators.



**Correct Answer: A**

Question #6 *Topic 5*

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Solution concept -

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- A. Configure Workload Identity and service accounts to be used by the application platform.
- B. Use Kubernetes Secrets, which are obfuscated by default. Configure these Secrets to be used by the application platform.
- C. Configure Kubernetes Secrets to store the secret, enable Application-Layer Secrets Encryption, and use Cloud Key Management Service (Cloud KMS) to manage the encryption keys. Configure these Secrets to be used by the application platform.
- D. Configure HashiCorp Vault on Compute Engine, and use customer managed encryption keys and Cloud Key Management Service (Cloud KMS) to manage the encryption keys. Configure these Secrets to be used by the application platform.



**Correct Answer:** A

Question #7 Topic 5

**Introductory Info** Company overview -

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- A. Upload your mobile app to the Firebase Test Lab, and test the mobile app on Android and iOS devices.
- B. Create Android and iOS VMs on Google Cloud, install the mobile app on the VMs, and test the mobile app.
- C. Create Android and iOS containers on Google Kubernetes Engine (GKE), install the mobile app on the containers, and test the mobile app.
- D. Upload your mobile app with different configurations to Firebase Hosting and test each configuration.



**Correct Answer: C**

## Topic 6 - Testlet 5

Question #1 *Topic 6*

**Introductory Info** 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 -

Ebay:sure-success

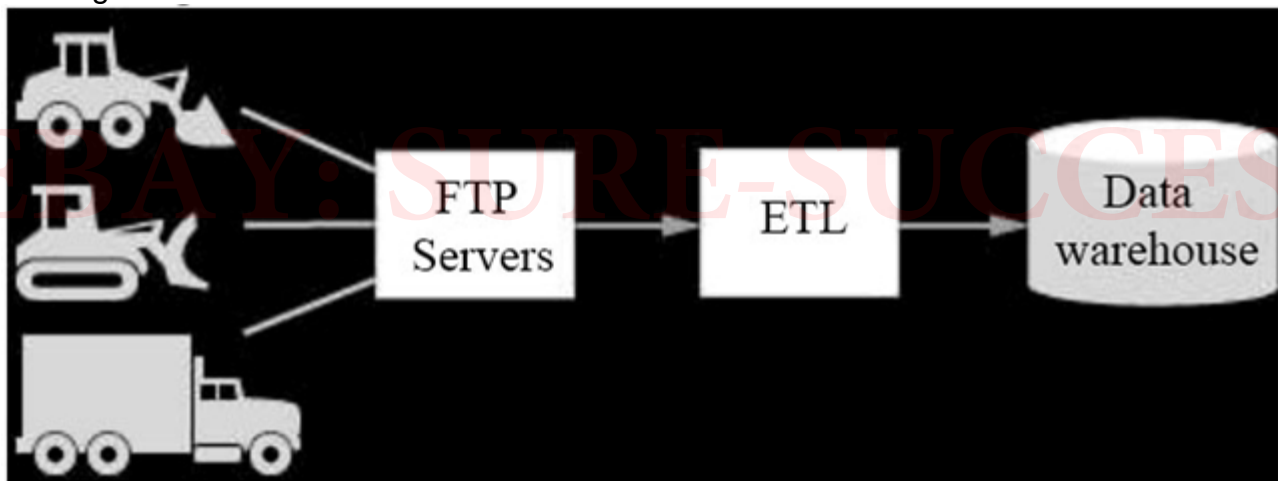
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TerramEarth is proud of their ability to innovate on their core products and find new markets as their customers' needs change. For the past 20 years, trends in the industry have been largely toward increasing productivity by using larger vehicles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

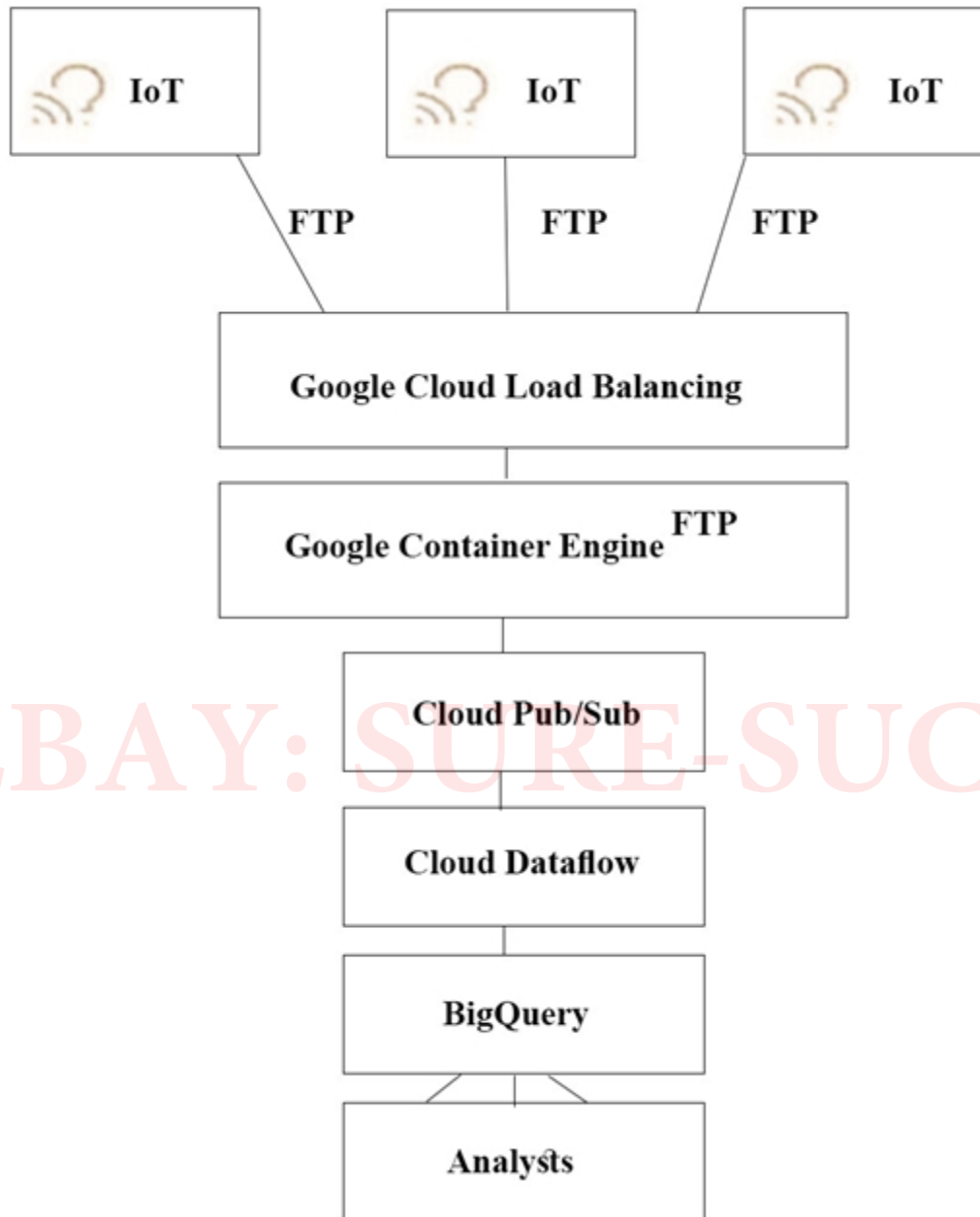
You want to allow analysts to centrally query the vehicle data.

Which architecture should you recommend?

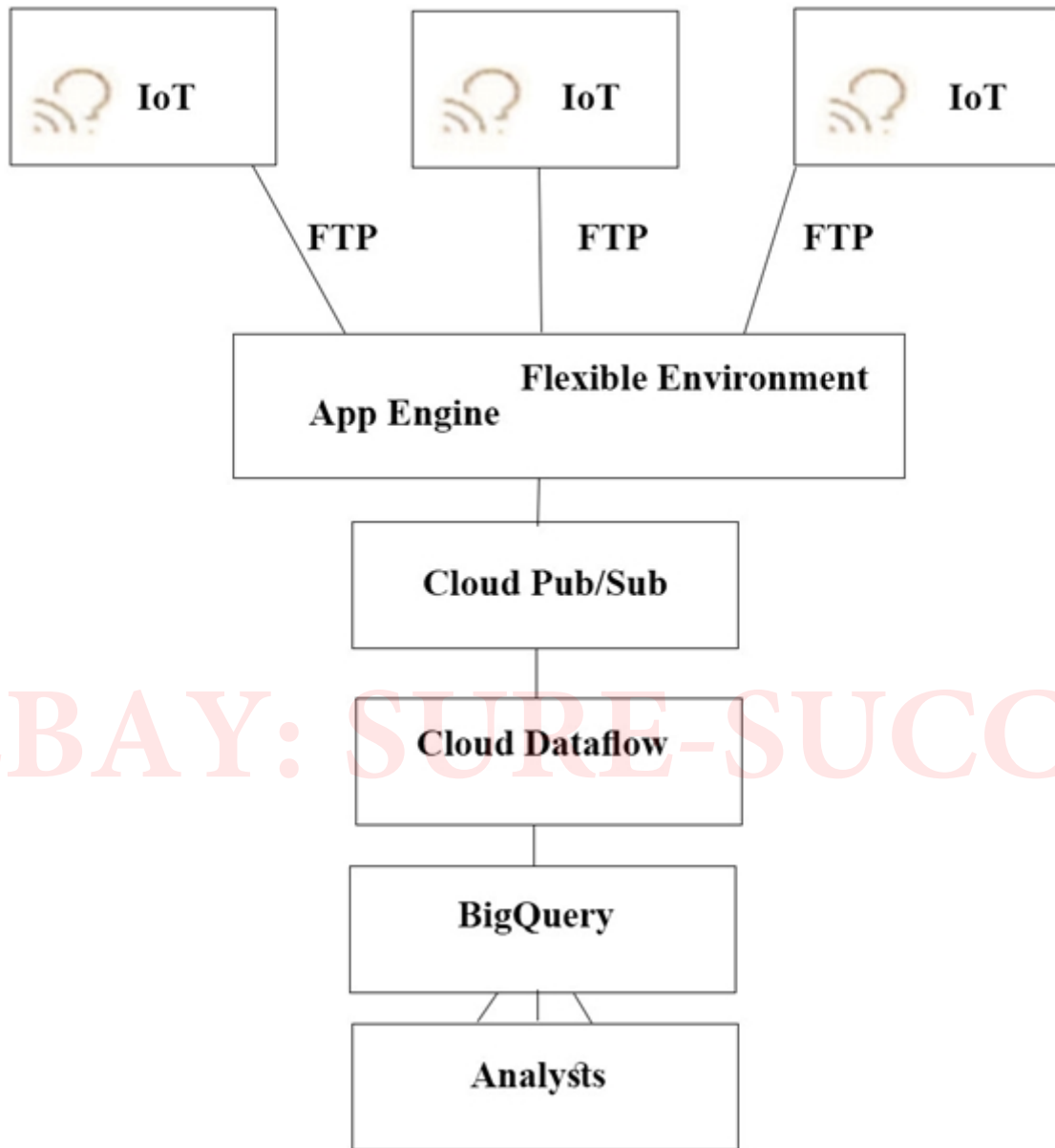
A.

# EBAY: SURE-SUCCESS

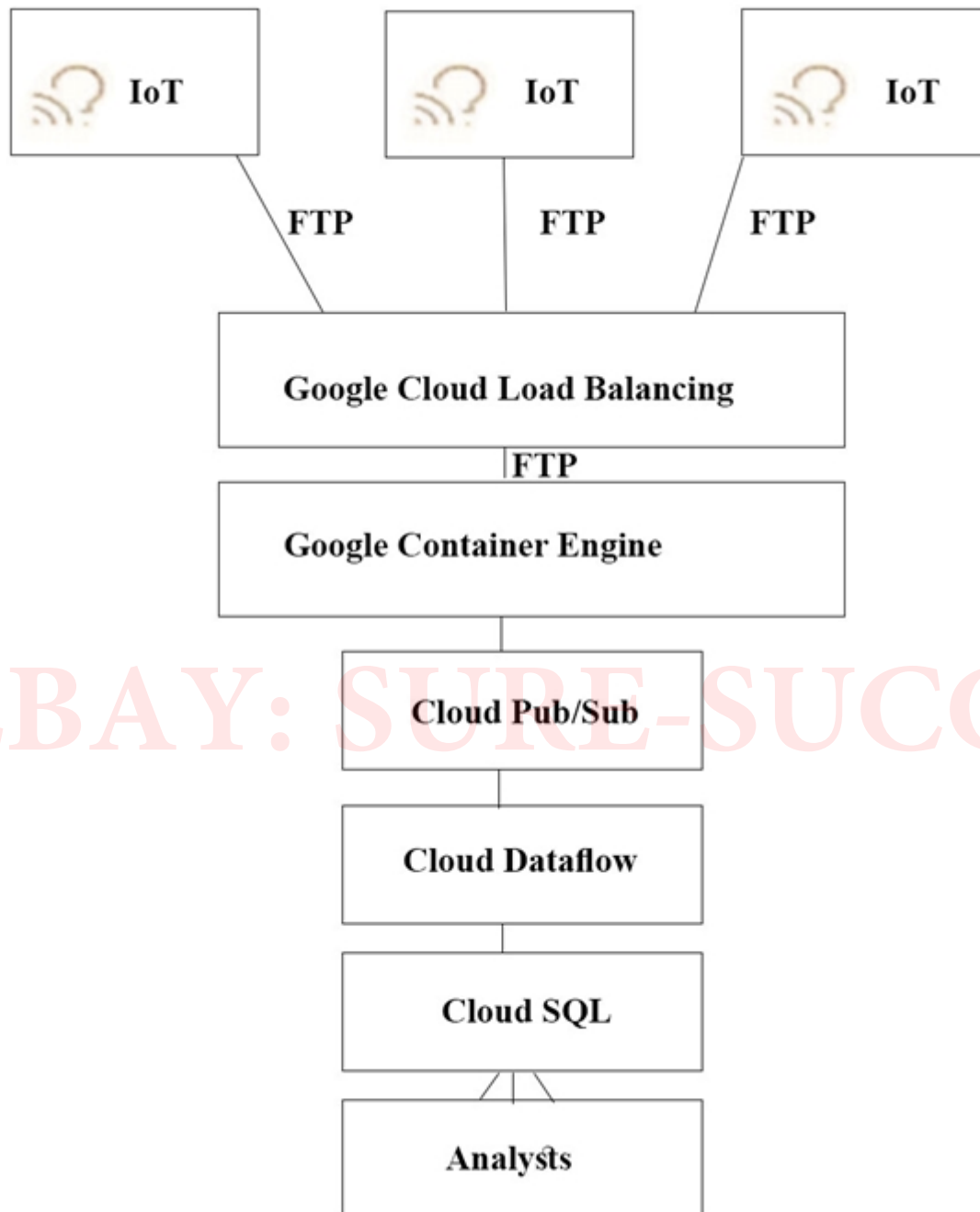




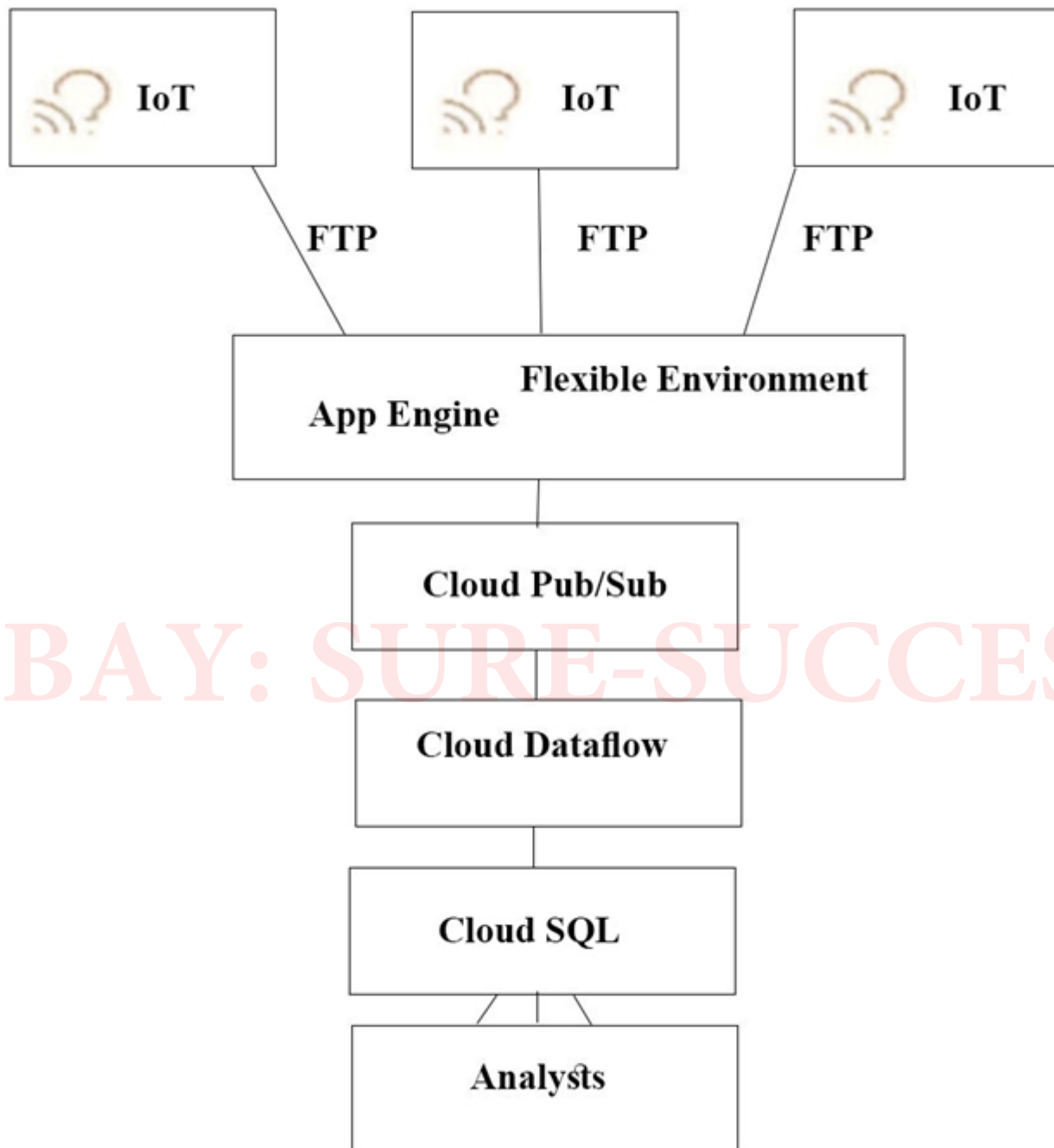
B.



C.



D.



**Correct Answer: A**

The push endpoint can be a load balancer.

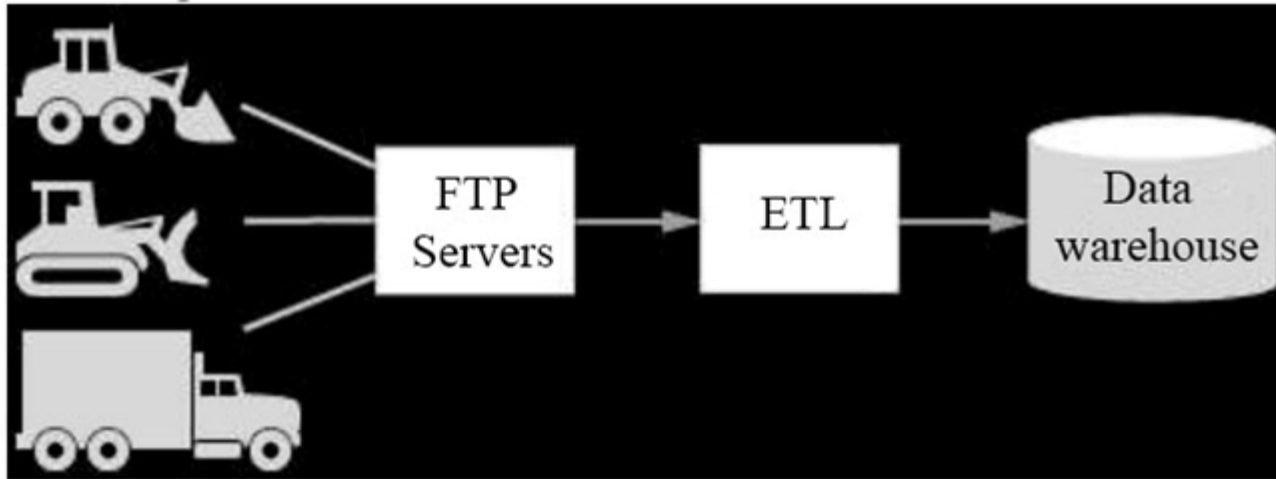
A container cluster can be used.

Cloud Pub/Sub for Stream Analytics



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.

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#### 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 -

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#### 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** 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.  
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**

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

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Reference:

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

**Question #3** Topic 6

**Introductory Info** 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.

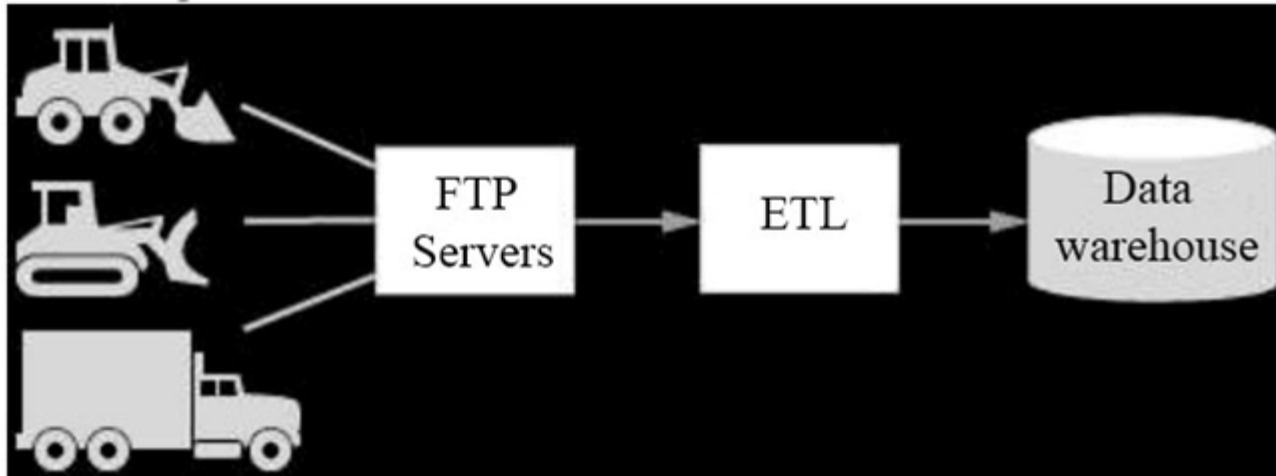
**Solution Concept -**

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, TerramEarth 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 -

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#### CTO Statement -

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incremental innovations. **Question** 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**

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 service- account 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 Topic 6

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Company background -

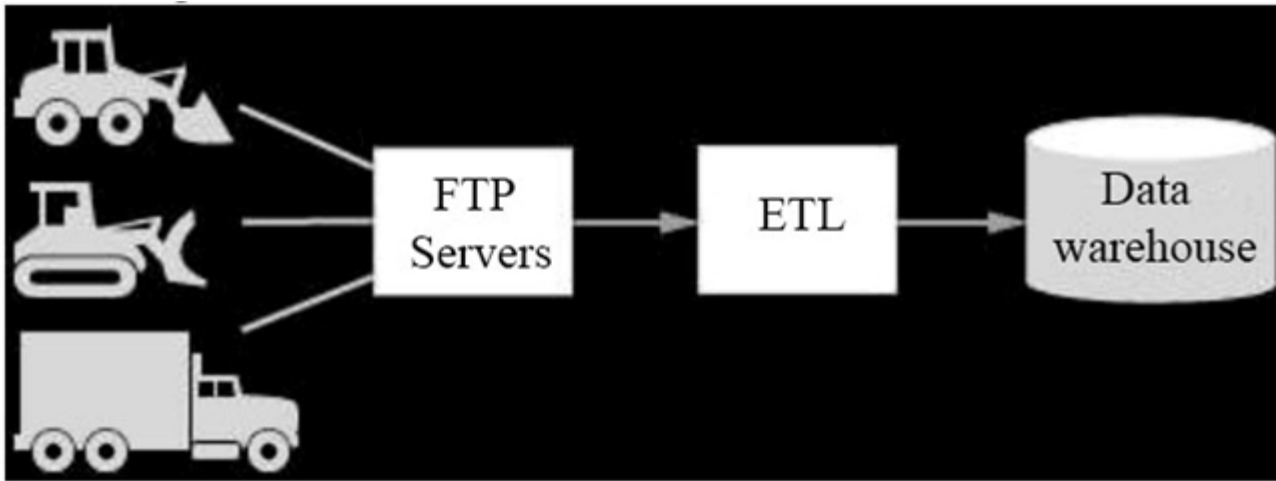
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- A. Vehicles write data directly to GCS

- 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**

Question #5 Topic 6

#### **Introductory Info** Company Overview -

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#### Company background -

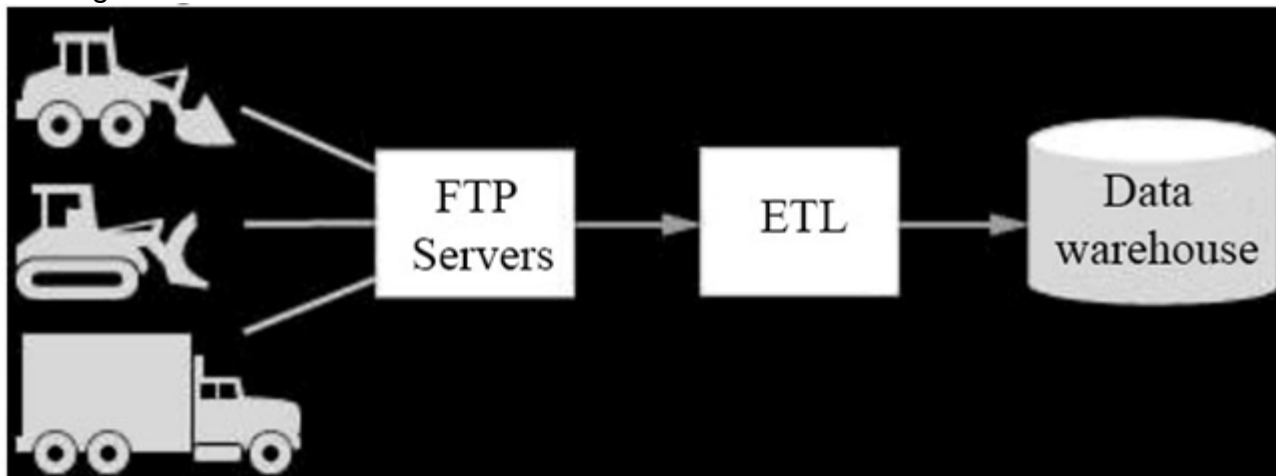
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- A. Migrate from CSV to binary format, migrate from FTP to SFTP transport, and develop machine learning analysis of metrics
- B. Migrate from FTP to streaming transport, migrate from CSV to binary format, and develop machine learning analysis of metrics
- 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

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 Topic 6

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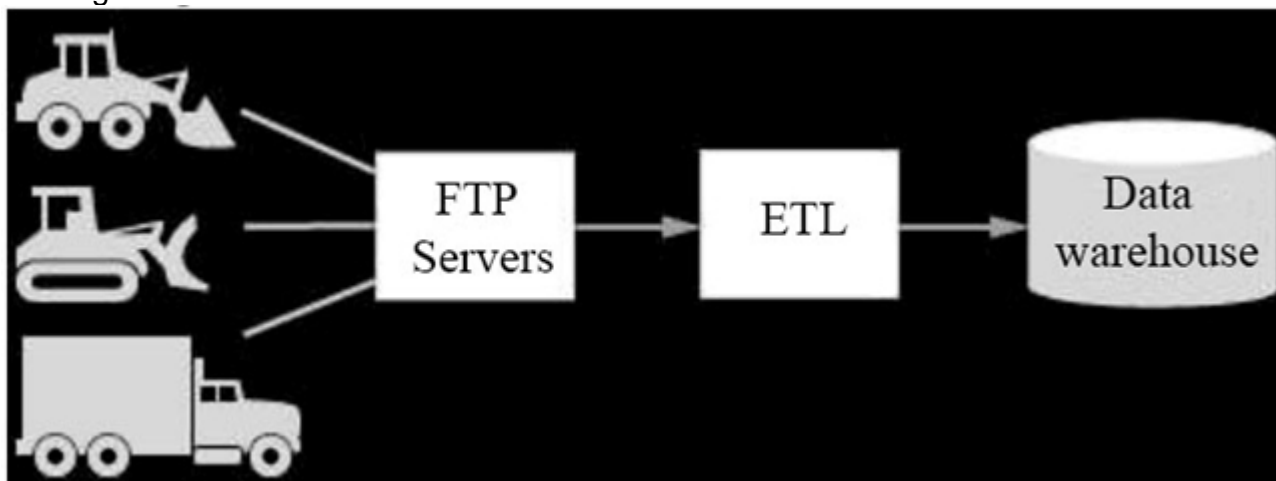
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TerramEarth is proud of their ability to innovate on their core products and find new markets as their customers' needs change. For the past 20 years, trends in the industry have been largely toward increasing productivity by using larger vehicles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

Question #7 Topic 6

**Introductory Info** 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.

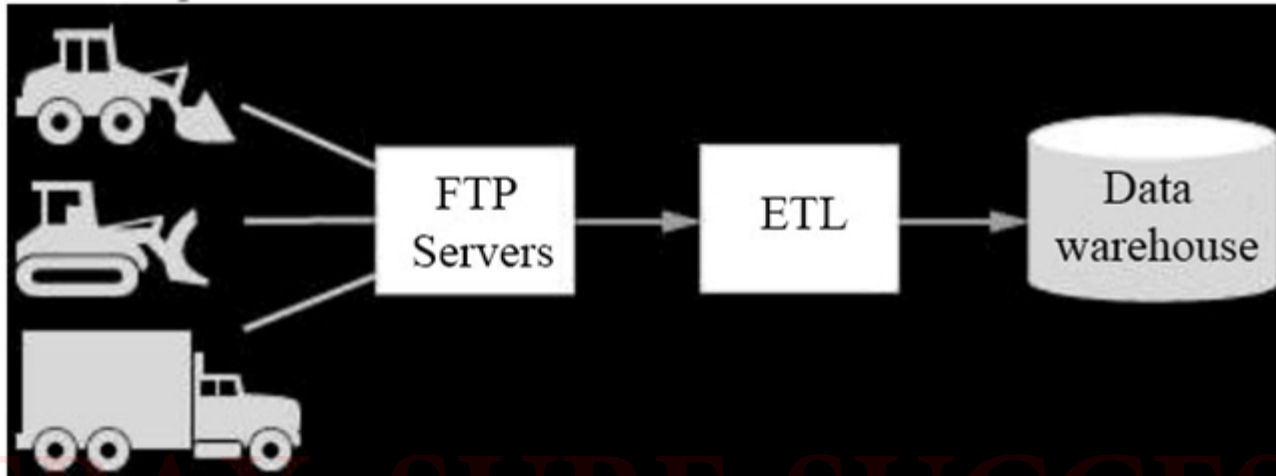
Solution Concept -

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, TerramEarth 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** 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**

Question #8 *Topic 6*

**Introductory Info** Company Overview -

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Company background -

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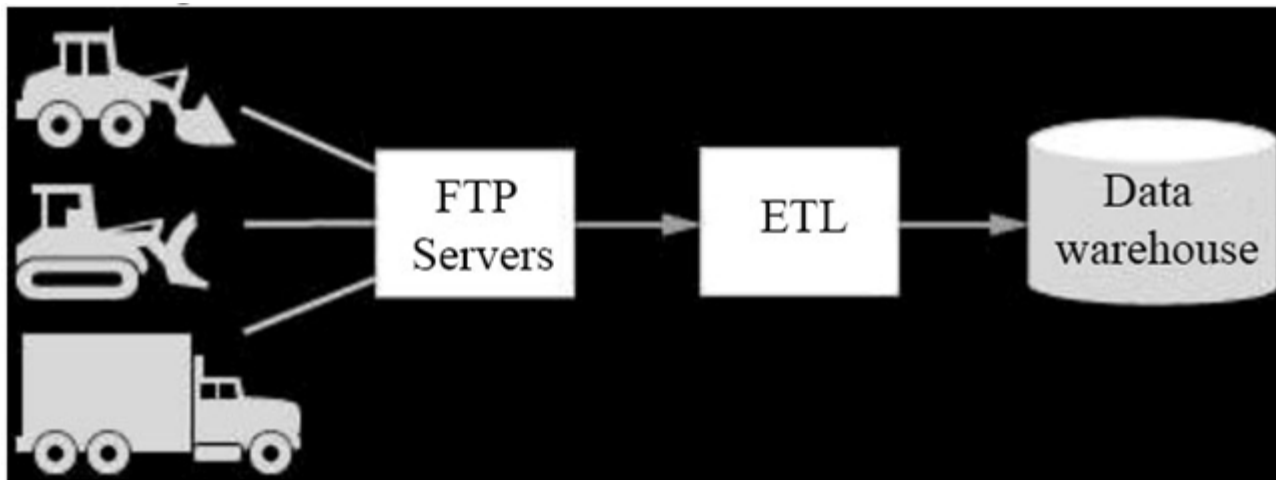
TerramEarth is proud of their ability to innovate on their core products and find new markets as their customers' needs change. For the past 20 years, trends in the industry have been largely toward increasing productivity by using larger vehicles with a human operator.

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, TerramEarth collects a total of about 9 TB/day from these connected vehicles.

Existing Technical Environment -

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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 -

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#### 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** TerramEarth's 20 million vehicles are scattered around the world. Based on the vehicles' 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**

Question #9 Topic 6

#### **Introductory Info** 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 -

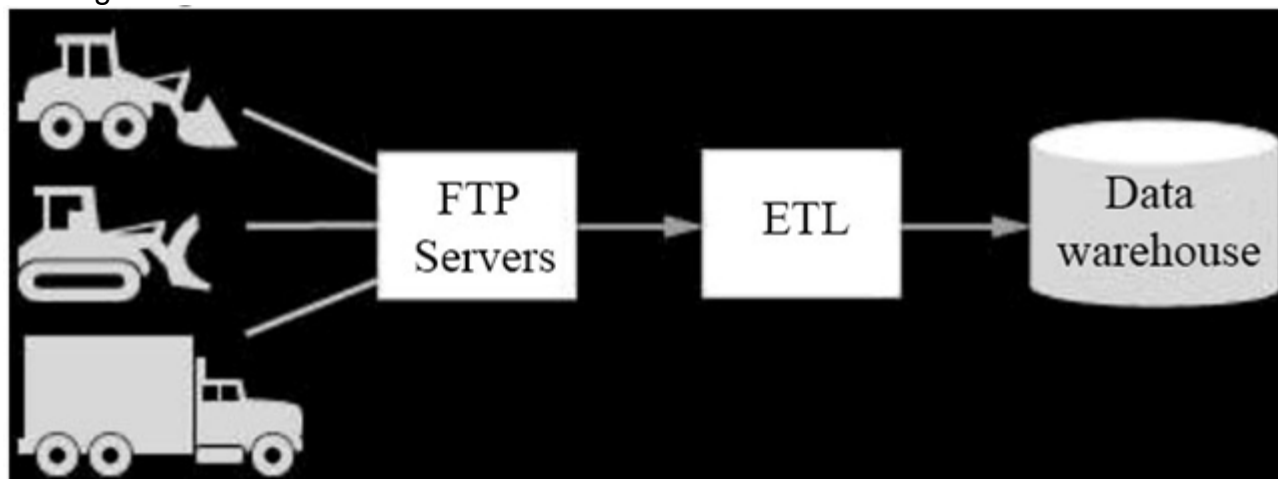
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TerramEarth is proud of their ability to innovate on their core products and find new markets as their customers' needs change. For the past 20 years, trends in the industry have been largely toward increasing productivity by using larger vehicles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

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 Topic 6

### **Introductory Info** Company Overview -

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### Company background -

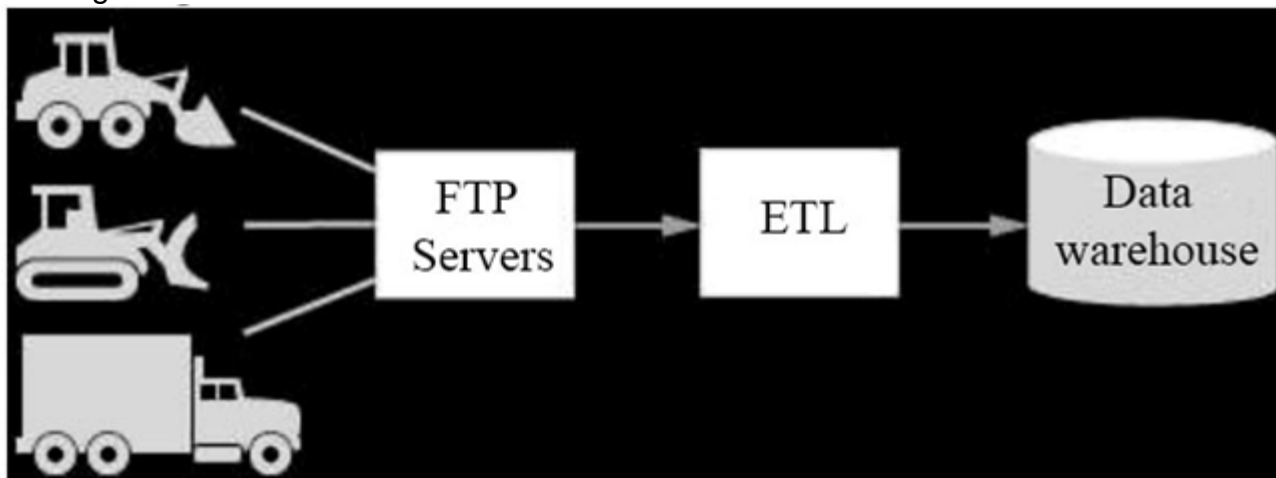
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### Solution Concept -

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-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.

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### Business Requirements -

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### CEO Statement -

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### 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** 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**

### Question #11 Topic 6

#### **Introductory Info** 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. [Ebay:sure-success](#)

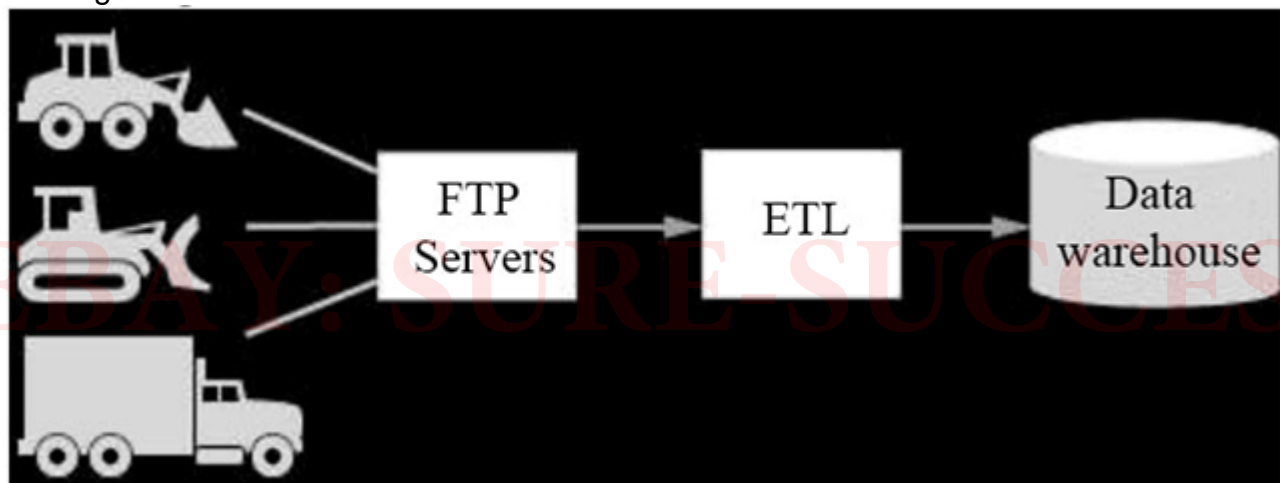


TerramEarth is proud of their ability to innovate on their core products and find new markets as their customers' needs change. For the past 20 years, trends in the industry have been largely toward increasing productivity by using larger vehicles with a human operator.

#### 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, TerramEarth 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 -

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### 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** 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 your 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**

### Topic 7 - Testlet 6

#### Question #1 Topic 7

#### **Introductory Info** 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** 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**

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Question #2 Topic 7

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

**Correct Answer: A**

Question #3 Topic 7

**Introductory Info** 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

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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**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**

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#### Question #4 Topic 7

##### **Introductory Info** 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** 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**

Question #5 Topic 7

**Introductory Info** 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** 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

#### Question #6 Topic 7

##### Introductory Info 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**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.

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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**

## Topic 8 - Testlet 7

Question #1 *Topic 8*

### **Introductory Info** 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

#### Application servers:

- Tomcat - Java micro-services
- Nginx - static content
- Apache Beam - Batch processing

#### Storage appliances:

- iSCSI for VM hosts
- Fiber channel SAN - MySQL databases
- NAS - image storage, logs, backups

#### Apache Hadoop/Spark servers:

- Data analysis
- Real-time trending calculations

#### MQ servers:



- 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** 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**

Question #2 *Topic 8*

**Introductory Info** 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

Application servers:

- Tomcat - Java micro-services
- Nginx - static content
- Apache Beam - Batch processing

Storage appliances:

- iSCSI for VM hosts
- Fiber channel SAN - MySQL databases
- NAS - image storage, logs, backups

Apache Hadoop/Spark servers:

- Data analysis
- Real-time trending calculations

MQ servers:

- 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**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**

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 *Topic 8*

##### **Introductory Info** 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

##### Application servers:

- Tomcat - Java micro-services
- Nginx - static content
- Apache Beam - Batch processing

##### Storage appliances:

- iSCSI for VM hosts
- Fiber channel SAN - MySQL databases
- NAS - image storage, logs, backups

##### Apache Hadoop/Spark servers:

- Data analysis
- Real-time trending calculations

##### MQ servers:

- 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** 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**

#### Question #4 Topic 8

##### **Introductory Info** 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

#### Application servers:

- Tomcat - Java micro-services
- Nginx - static content
- Apache Beam - Batch processing

#### Storage appliances:

- iSCSI for VM hosts
- Fiber channel SAN - MySQL databases
- NAS - image storage, logs, backups

#### Apache Hadoop/Spark servers:

- Data analysis
- Real-time trending calculations

#### MQ servers:

- 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** 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**

**Question #5 Topic 8**

**Introductory Info** 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

#### Application servers:

- Tomcat - Java micro-services
- Nginx - static content
- Apache Beam - Batch processing

#### Storage appliances:

- iSCSI for VM hosts
- Fiber channel SAN - MySQL databases
- NAS - image storage, logs, backups

#### Apache Hadoop/Spark servers:

- Data analysis
- Real-time trending calculations

#### MQ servers:

- 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** 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**

#### Question #6 *Topic 8*

##### **Introductory Info** 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

Application servers:

- Tomcat - Java micro-services
- Nginx - static content
- Apache Beam - Batch processing

Storage appliances:

- iSCSI for VM hosts
- Fiber channel SAN - MySQL databases
- NAS - image storage, logs, backups

Apache Hadoop/Spark servers:

- Data analysis
- Real-time trending calculations

MQ servers:

- 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.

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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** 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**

Question #7 Topic 8

**Introductory Info** 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

Application servers:

- Tomcat - Java micro-services
- Nginx - static content
- Apache Beam - Batch processing

Storage appliances:

- iSCSI for VM hosts
- Fiber channel SAN - MySQL databases
- NAS - image storage, logs, backups

Apache Hadoop/Spark servers:

- Data analysis
- Real-time trending calculations

MQ servers:

- 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** 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](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**

Question #8 *Topic 8*

#### **Introductory Info** 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

##### Application servers:

- Tomcat - Java micro-services
- Nginx - static content
- Apache Beam - Batch processing

##### Storage appliances:

- iSCSI for VM hosts
- Fiber channel SAN - MySQL databases
- NAS - image storage, logs, backups

##### Apache Hadoop/Spark servers:

- Data analysis
- Real-time trending calculations

##### MQ servers:

- 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.

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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.

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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 -

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CTO Statement -

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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**As part of their new application experience, Dress4Win 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**

Question #9 *Topic 8*

#### **Introductory Info** 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

##### Application servers:

- Tomcat - Java micro-services
- Nginx - static content
- Apache Beam - Batch processing

##### Storage appliances:

- iSCSI for VM hosts
- Fiber channel SAN - MySQL databases
- NAS - image storage, logs, backups

##### Apache Hadoop/Spark servers:

- Data analysis
- Real-time trending calculations

##### MQ servers:

- 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.

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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** 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**

## Question #10 *Topic 8*

### **Introductory Info** Company Overview -

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### 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

#### Application servers:

- Tomcat - Java micro-services
- Nginx - static content
- Apache Beam - Batch processing

#### Storage appliances:

- iSCSI for VM hosts
- Fiber channel SAN - MySQL databases
- NAS - image storage, logs, backups

#### Apache Hadoop/Spark servers:

- Data analysis
- Real-time trending calculations

#### MQ servers:

- 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.

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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 -

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#### 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** 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**

Reference:

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

#### Question #11 Topic 8

##### **Introductory Info** Company Overview -

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### 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

#### Application servers:

- Tomcat - Java micro-services
- Nginx - static content
- Apache Beam - Batch processing

#### Storage appliances:

- iSCSI for VM hosts
- Fiber channel SAN - MySQL databases
- NAS - image storage, logs, backups

#### Apache Hadoop/Spark servers:

- Data analysis
- Real-time trending calculations

#### MQ servers:

- 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.

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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.

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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 -

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#### CTO Statement -

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#### 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** 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, Dress4Win 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**

#### Topic 9 - Testlet 8

Question #1 Topic 9

##### Introductory Info 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.

λ€'

- 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 λ€' MySQL databases

- 1 PB total storage; 400 TB available

NAS λ€' 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.

EBAY: SURE-SUCCESS



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** 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**

#### Question #2 Topic 9

##### **Introductory Info** 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 for MySQL databases

- 1 PB total storage; 400 TB available

NAS for 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** 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**

Question #3 *Topic 9*

**Introductory Info** 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 for MySQL databases

- 1 PB total storage; 400 TB available

NAS for 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** 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**

#### Question #4 Topic 9

##### **Introductory Info** 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.

λ€"

- 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 λ€" MySQL databases

- 1 PB total storage; 400 TB available

NAS λ€" 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.

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



**Correct Answer: D**

#### Question #5 Topic 9

##### **Introductory Info** 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.

λ€"

- 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 λ€" MySQL databases

- 1 PB total storage; 400 TB available

NAS λ€" 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** 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**

#### Question #6 Topic 9

##### **Introductory Info** 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.

λ€"

- 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 λ€" MySQL databases

- 1 PB total storage; 400 TB available

NAS λ€" 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.

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#### 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** 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**

#### Topic 10 - Testlet 9

##### Question #1 Topic 10

#### Introductory Info Company overview -

Helicopter Racing League (HRL) is a global sports league for competitive helicopter racing. Each year HRL holds the world championship and several regional league competitions where teams compete to earn a spot in the world championship. HRL offers a paid service to stream the races all over the world with live telemetry and predictions throughout each race.

#### Solution concept -

HRL wants to migrate their existing service to a new platform to expand their use of managed AI and ML services to facilitate race predictions. Additionally, as new fans engage with the sport, particularly in emerging regions, they want to move the serving of their content, both real-time and recorded, closer to their users.

#### Existing technical environment -

HRL is a public cloud-first company; the core of their mission-critical applications runs on their current public cloud provider. Video recording and editing is performed at the race tracks, and the content is encoded and transcoded, where needed, in the cloud. Enterprise-grade connectivity and

local compute is provided by truck-mounted mobile data centers. Their race prediction services are hosted exclusively on their existing public cloud provider. Their existing technical environment is as follows:

Existing content is stored in an object storage service on their existing public cloud provider.

Video encoding and transcoding is performed on VMs created for each job.

Race predictions are performed using TensorFlow running on VMs in the current public cloud provider.

Business requirements -

HRL's owners want to expand their predictive capabilities and reduce latency for their viewers in emerging markets. Their requirements are:

Support ability to expose the predictive models to partners.

Increase predictive capabilities during and before races:

- Race results

- Mechanical failures

- Crowd sentiment

Increase telemetry and create additional insights.

Measure fan engagement with new predictions.

Enhance global availability and quality of the broadcasts.

Increase the number of concurrent viewers.

Minimize operational complexity.

Ensure compliance with regulations.

Create a merchandising revenue stream.

Technical requirements -

Maintain or increase prediction throughput and accuracy.

Reduce viewer latency.

Increase transcoding performance.

Create real-time analytics of viewer consumption patterns and engagement.

Create a data mart to enable processing of large volumes of race data.

Executive statement -

Our CEO, S. Hawke, wants to bring high-adrenaline racing to fans all around the world. We listen to our fans, and they want enhanced video streams that include predictions of events within the race (e.g., overtaking). Our current platform allows us to predict race outcomes but lacks the facility to support real-time predictions during races and the capacity to process season-long results. **Question** For this question, refer to the Helicopter Racing League (HRL) case study. Your team is in charge of creating a payment card data vault for card numbers used to bill tens of thousands of viewers, merchandise consumers, and season ticket holders. You need to implement a custom card tokenization service that meets the following requirements:

- It must provide low latency at minimal cost.

- It must be able to identify duplicate credit cards and must not store plaintext card numbers.

- It should support annual key rotation.

Which storage approach should you adopt for your tokenization service?

- A. Store the card data in Secret Manager after running a query to identify duplicates.
- B. Encrypt the card data with a deterministic algorithm stored in Firestore using Datastore mode.
- C. Encrypt the card data with a deterministic algorithm and shard it across multiple Memorystore instances.

- D. Use column-level encryption to store the data in Cloud SQL.



**Correct Answer: D**

Question #2 *Topic 10*

**Introductory Info** Company overview -

Helicopter Racing League (HRL) is a global sports league for competitive helicopter racing. Each year HRL holds the world championship and several regional league competitions where teams compete to earn a spot in the world championship. HRL offers a paid service to stream the races all over the world with live telemetry and predictions throughout each race.

Solution concept -

HRL wants to migrate their existing service to a new platform to expand their use of managed AI and ML services to facilitate race predictions. Additionally, as new fans engage with the sport, particularly in emerging regions, they want to move the serving of their content, both real-time and recorded, closer to their users.

Existing technical environment -

HRL is a public cloud-first company; the core of their mission-critical applications runs on their current public cloud provider. Video recording and editing is performed at the race tracks, and the content is encoded and transcoded, where needed, in the cloud. Enterprise-grade connectivity and local compute is provided by truck-mounted mobile data centers. Their race prediction services are hosted exclusively on their existing public cloud provider. Their existing technical environment is as follows:

Existing content is stored in an object storage service on their existing public cloud provider.

Video encoding and transcoding is performed on VMs created for each job.

Race predictions are performed using TensorFlow running on VMs in the current public cloud provider.

Business requirements -

HRL's owners want to expand their predictive capabilities and reduce latency for their viewers in emerging markets. Their requirements are:

Support ability to expose the predictive models to partners.

Increase predictive capabilities during and before races:

— Race results

— Mechanical failures

— Crowd sentiment

Increase telemetry and create additional insights.

Measure fan engagement with new predictions.

Enhance global availability and quality of the broadcasts.

Increase the number of concurrent viewers.

Minimize operational complexity.

Ensure compliance with regulations.

Create a merchandising revenue stream.

Technical requirements -

Maintain or increase prediction throughput and accuracy.

Reduce viewer latency.

Increase transcoding performance.

Create real-time analytics of viewer consumption patterns and engagement.

Create a data mart to enable processing of large volumes of race data.

Executive statement -

Our CEO, S. Hawke, wants to bring high-adrenaline racing to fans all around the world. We listen to our fans, and they want enhanced video streams that include predictions of events within the race (e.g., overtaking). Our current platform allows us to predict race outcomes but lacks the facility to support real-time predictions during races and the capacity to process season-long results. **Question** For this question, refer to the Helicopter Racing League (HRL) case study. Recently HRL started a new regional racing league in Cape Town, South Africa. In an effort to give customers in Cape Town a better user experience, HRL has partnered with the Content Delivery Network provider, Fastly. HRL needs to allow traffic coming from all of the Fastly IP address ranges into their Virtual Private Cloud network (VPC network). You are a member of the HRL security team and you need to configure the update that will allow only the Fastly IP address ranges through the External HTTP(S) load balancer. Which command should you use?

- A. `gcloud compute security-policies rules update 1000 \ --security-policy from-fastly \ --src-ip-ranges * \ --action allow`
- B. `gcloud compute firewall rules update sourceip-list-fastly \ --priority 100 \ --allow tcp:443`
- C. `gcloud compute firewall rules update hir-policy \ --priority 100 \ --target-tags=sourceip-list-fastly \ --allow tcp:443`
- D. `gcloud compute security-policies rules update 1000 \ --security-policy hir-policy \ --expression evaluatePreconfiguredExpr('sourceip-list-fastly') \ --action allow`



**Correct Answer: A**

Reference:

<https://cloud.google.com/load-balancing/docs/https>

Question #3 Topic 10

**Introductory Info** Company overview -

Helicopter Racing League (HRL) is a global sports league for competitive helicopter racing. Each year HRL holds the world championship and several regional league competitions where teams compete to earn a spot in the world championship. HRL offers a paid service to stream the races all over the world with live telemetry and predictions throughout each race.

Solution concept -

HRL wants to migrate their existing service to a new platform to expand their use of managed AI and ML services to facilitate race predictions. Additionally, as new fans engage with the sport, particularly in emerging regions, they want to move the serving of their content, both real-time and recorded, closer to their users.

Existing technical environment -

HRL is a public cloud-first company; the core of their mission-critical applications runs on their current public cloud provider. Video recording and editing is performed at the race tracks, and the content is encoded and transcoded, where needed, in the cloud. Enterprise-grade connectivity and local compute is provided by truck-mounted mobile data centers. Their race prediction services are hosted exclusively on their existing public cloud provider. Their existing technical environment is as follows:

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provider.

Business requirements -

HRL's owners want to expand their predictive capabilities and reduce latency for their viewers in emerging markets. Their requirements are:

Support ability to expose the predictive models to partners.

Increase predictive capabilities during and before races:

— Race results

— Mechanical failures

— Crowd sentiment

Increase telemetry and create additional insights.

Measure fan engagement with new predictions.

Enhance global availability and quality of the broadcasts.

Increase the number of concurrent viewers.

Minimize operational complexity.

Ensure compliance with regulations.

Create a merchandising revenue stream.

Technical requirements -

Maintain or increase prediction throughput and accuracy.

Reduce viewer latency.

Increase transcoding performance.

Create real-time analytics of viewer consumption patterns and engagement.

Create a data mart to enable processing of large volumes of race data.

Executive statement -

Our CEO, S. Hawke, wants to bring high-adrenaline racing to fans all around the world. We listen to our fans, and they want enhanced video streams that include predictions of events within the race (e.g., overtaking). Our current platform allows us to predict race outcomes but lacks the facility to support real-time predictions during races and the capacity to process season-long results. **Question** For this question, refer to the Helicopter Racing League (HRL) case study. The HRL development team releases a new version of their predictive capability application every Tuesday evening at 3 a.m. UTC to a repository. The security team at HRL has developed an in-house penetration test Cloud Function called

Airwolf. The security team wants to run Airwolf against the predictive capability application as soon as it is released every Tuesday. You need to set up Airwolf to run at the recurring weekly cadence. What should you do?

- A. Set up Cloud Tasks and a Cloud Storage bucket that triggers a Cloud Function.
- B. Set up a Cloud Logging sink and a Cloud Storage bucket that triggers a Cloud Function.
- C. Configure the deployment job to notify a Pub/Sub queue that triggers a Cloud Function.
- D. Set up Identity and Access Management (IAM) and Confidential Computing to trigger a Cloud Function.



**Correct Answer: A**

Question #4 Topic 10

**Introductory Info** Company overview - [Ebay:sure-success](#)



Helicopter Racing League (HRL) is a global sports league for competitive helicopter racing. Each year HRL holds the world championship and several regional league competitions where teams compete to earn a spot in the world championship. HRL offers a paid service to stream the races all over the world with live telemetry and predictions throughout each race.

#### Solution concept -

HRL wants to migrate their existing service to a new platform to expand their use of managed AI and ML services to facilitate race predictions. Additionally, as new fans engage with the sport, particularly in emerging regions, they want to move the serving of their content, both real-time and recorded, closer to their users.

#### Existing technical environment -

HRL is a public cloud-first company; the core of their mission-critical applications runs on their current public cloud provider. Video recording and editing is performed at the race tracks, and the content is encoded and transcoded, where needed, in the cloud. Enterprise-grade connectivity and local compute is provided by truck-mounted mobile data centers. Their race prediction services are hosted exclusively on their existing public cloud provider. Their existing technical environment is as follows:

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#### Technical requirements -

Maintain or increase prediction throughput and accuracy.

Reduce viewer latency.

Increase transcoding performance.

Create real-time analytics of viewer consumption patterns and engagement.

Create a data mart to enable processing of large volumes of race data.

#### Executive statement -

Our CEO, S. Hawke, wants to bring high-adrenaline racing to fans all around the world. We listen to our fans, and they want enhanced video streams that include predictions of events within the race (e.g., overtaking). Our current platform allows us to predict race outcomes but lacks the facility to support real-time predictions during races and the capacity to process season-long results. **Question** For this question, refer to the Helicopter Racing League (HRL) case study. HRL

wants better prediction accuracy from their ML prediction models. They want you to use Google's AI Platform so HRL can understand and interpret the predictions. What should you do?

- A. Use Explainable AI.
- B. Use Vision AI.
- C. Use Google Cloud's operations suite.
- D. Use Jupyter Notebooks.

**Correct Answer: A**

Reference:

<https://cloud.google.com/ai-platform/prediction/docs/ai-explanations/preparing-metadata>

Question #5 Topic 10

**Introductory Info** Company overview -

Helicopter Racing League (HRL) is a global sports league for competitive helicopter racing. Each year HRL holds the world championship and several regional league competitions where teams compete to earn a spot in the world championship. HRL offers a paid service to stream the races all over the world with live telemetry and predictions throughout each race.

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HRL wants to migrate their existing service to a new platform to expand their use of managed AI and ML services to facilitate race predictions. Additionally, as new fans engage with the sport, particularly in emerging regions, they want to move the serving of their content, both real-time and recorded, closer to their users.

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HRL is a public cloud-first company; the core of their mission-critical applications runs on their current public cloud provider. Video recording and editing is performed at the race tracks, and the content is encoded and transcoded, where needed, in the cloud. Enterprise-grade connectivity and local compute is provided by truck-mounted mobile data centers. Their race prediction services are hosted exclusively on their existing public cloud provider. Their existing technical environment is as follows:

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Technical requirements -

Maintain or increase prediction throughput and accuracy.  
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Create a data mart to enable processing of large volumes of race data.

Executive statement -

Our CEO, S. Hawke, wants to bring high-adrenaline racing to fans all around the world. We listen to our fans, and they want enhanced video streams that include predictions of events within the race (e.g., overtaking). Our current platform allows us to predict race outcomes but lacks the facility to support real-time predictions during races and the capacity to process season-long results.**Question**For this question, refer to the Helicopter Racing League (HRL) case study. HRL is looking for a cost-effective approach for storing their race data such as telemetry. They want to keep all historical records, train models using only the previous season's data, and plan for data growth in terms of volume and information collected. You need to propose a data solution. Considering HRL business requirements and the goals expressed by CEO S. Hawke, what should you do?

- A. Use Firestore for its scalable and flexible document-based database. Use collections to aggregate race data by season and event.
- B. Use Cloud Spanner for its scalability and ability to version schemas with zero downtime. Split race data using season as a primary key.
- C. Use BigQuery for its scalability and ability to add columns to a schema. Partition race data based on season.
- D. Use Cloud SQL for its ability to automatically manage storage increases and compatibility with MySQL. Use separate database instances for each season.

**Correct Answer: C**

Reference:

<https://cloud.google.com/bigquery/public-data>

Question #6 Topic 10

**Introductory Info**Company overview -

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Solution concept -

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Existing technical environment -

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HRL is a public cloud-first company; the core of their mission-critical applications runs on their current public cloud provider. Video recording and editing is performed at the race tracks, and the content is encoded and transcoded, where needed, in the cloud. Enterprise-grade connectivity and local compute is provided by truck-mounted mobile data centers. Their race prediction services are hosted exclusively on their existing public cloud provider. Their existing technical environment is as follows:

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Technical requirements -

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Executive statement -

Our CEO, S. Hawke, wants to bring high-adrenaline racing to fans all around the world. We listen to our fans, and they want enhanced video streams that include predictions of events within the race (e.g., overtaking). Our current platform allows us to predict race outcomes but lacks the facility to support real-time predictions during races and the capacity to process season-long results. **Question** For this question, refer to the Helicopter Racing League (HRL) case study. A recent finance audit of cloud infrastructure noted an exceptionally high number of Compute Engine instances are allocated to do video encoding and transcoding. You suspect that these Virtual Machines are zombie machines that were not deleted after their workloads completed. You need to quickly get a list of which VM instances are idle. What should you do?

- A. Log into each Compute Engine instance and collect disk, CPU, memory, and network usage statistics for analysis.
- B. Use the `gcloud compute instances list` to list the virtual machine instances that have the `idle: true` label set.
- C. Use the `gcloud recomender` command to list the idle virtual machine instances.

- D. From the Google Console, identify which Compute Engine instances in the managed instance groups are no longer responding to health check probes.

**Correct Answer:** A

Reference:

<https://cloud.google.com/compute/docs/instances/viewing-and-applying-idle-vm-recommendations>

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