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QUESTION 1
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.

Answer: D
Explanation:
D - Cloud Storage 3 yrs estimated at 3k per 3 years
References:
https://cloud.google.com/monitoring/api/v3/metrics
https://cloud.google.com/stackdriver/

QUESTION 2
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

Answer: A
Explanation:
Google Cloud Dedicated Interconnect provides direct physical connections and RFC 1918 communication between your on-premises network and Google's network. Dedicated Interconnect enables you to transfer large amounts of data between networks, which can be more cost effective than purchasing additional bandwidth over the public Internet or using VPN tunnels.

Benefits:
- Traffic between your on-premises network and your VPC network doesn't traverse the public Internet. Traffic traverses a dedicated connection with fewer hops, meaning there are less points of failure where traffic might get dropped or disrupted.
- Your VPC network's internal (RFC 1918) IP addresses are directly accessible from your on-premises network. You don't need to use a NAT device or VPN tunnel to reach internal IP addresses. Currently, you can only reach internal IP addresses over a dedicated connection. To reach Google external IP addresses, you must use a separate connection.
- You can scale your connection to Google based on your needs. Connection capacity is delivered over one or more 10 Gbps Ethernet connections, with a maximum of eight connections (80 Gbps total per interconnect).
- The cost of egress traffic from your VPC network to your on-premises network is reduced. A dedicated connection is generally the least expensive method if you have a high-volume of traffic to and from Google's network.

References: https://cloud.google.com/interconnect/docs/details/dedicated

QUESTION 3
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

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

References: https://cloud.google.com/dataproc/docs/resources/faq

QUESTION 4
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

Answer: B
Explanation:
Google Compute Engine enables users to launch virtual machines (VMs) on demand. VMs can be launched from the standard images or custom images created by users.

Managed instance groups offer autoscaling capabilities that allow you to automatically add or remove instances from a managed instance group based on increases or decreases in load. Autoscaling helps your applications gracefully handle increases in traffic and reduces cost when the need for resources is lower.

Incorrect Answers:
B: There is no mention of incoming IP data traffic for the custom C++ applications.

C: Apache Hadoop is not fit for testing C++ applications. Apache Hadoop is an open-source software framework used for distributed storage and processing of datasets of big data using the MapReduce programming model.

D: Google App Engine is intended to be used for web applications.

Google App Engine (often referred to as GAE or simply App Engine) is a web framework and cloud computing platform for developing and hosting web applications in Google-managed data centers.

References: https://cloud.google.com/compute/docs/autoscaler/

QUESTION 5
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

Answer: BC
Explanation:
B: With Container Engine, Google will automatically deploy your cluster for you, update, patch, secure the nodes.
Kubernetes Engine's cluster autoscaler automatically resizes clusters based on the demands of the workloads you want to run.
C: Solutions like Datastore, BigQuery, AppEngine, etc are truly NoOps.
App Engine by default scales the number of instances running up and down to match the load, thus providing consistent performance for your app at all times while minimizing idle instances and thus reducing cost.
Note: At a high level, NoOps means that there is no infrastructure to build out and manage during usage of the platform. Typically, the compromise you make with NoOps is that you lose control of the underlying infrastructure.

References: https://www.quora.com/How-well-does-Google-Container-Engine-support-Google-Cloud-Platform%E2%80%99s-NoOps-claim

QUESTION 6
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 Kubernetes Engine and Cloud Deployment Manager

D. Google Kubernetes Engine, Jenkins, and Cloud Load Balancing

Answer: D
Explanation:
Google Container Engine, Jenkins, and Helm At first glance it appears answer D does not meet "all of his requirements" since it seems misses the "Route network traffic to specific services based on URL", an obvious feature for Cloud Load Balancing. If looking further, we know, unlike Compute Engine, the Kubernetes Engine offers integrated support for two types of cloud load balancing for a publicly accessible application. One of them is HTTP(S) load balancers are designed to terminate HTTP(S) requests and can make better context-aware load balancing decisions.
Incorrect Answers:
A: Helm is a tool for managing Kubernetes charts. Charts are packages of pre-configured Kubernetes resources.
Use Helm to:
- Find and use popular software packaged as Kubernetes charts
- Share your own applications as Kubernetes charts
- Create reproducible builds of your Kubernetes applications
- Intelligently manage your Kubernetes manifest files
- Manage releases of Helm packages

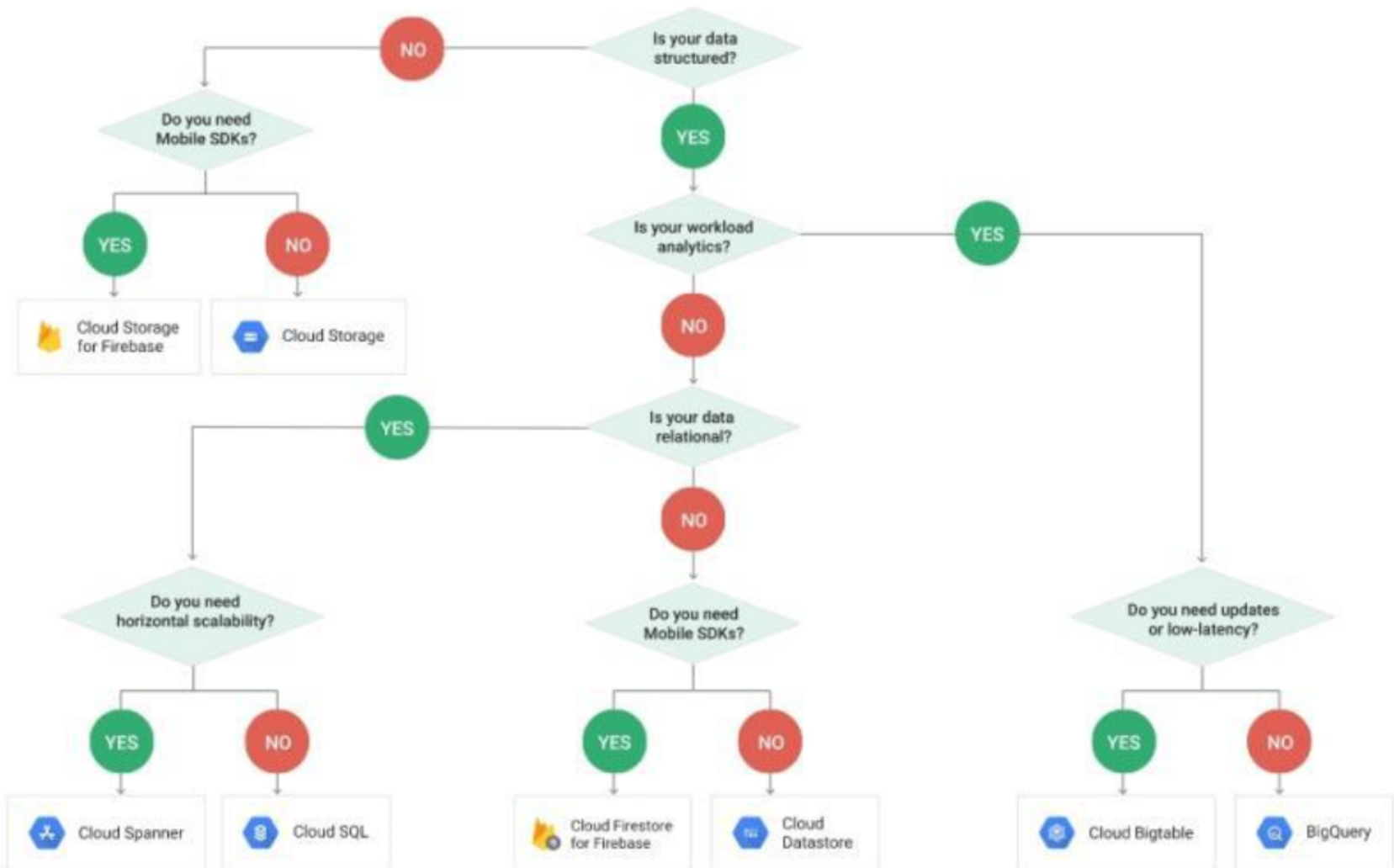
References: https://cloud.google.com/solutions/jenkins-on-kubernetes-engine

QUESTION 7
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-through per day. The link leads to a simple website that explains the promotion and collects user information and preferences.

Which infrastructure should you recommend? Choose 2 answers.

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.

Answer: AC
Explanation:



References: https://cloud.google.com/storage-options/

QUESTION 8
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.

Answer: D
Explanation:
Write a log entry. If the log does not exist, it is created. You can specify a severity for the log entry, and you can write a structured log entry by specifying --payload-type=json and writing your message as a JSON string:

gcloud logging write LOG STRING
gcloud logging write LOG JSON-STRING --payload-type=json

References: https://cloud.google.com/logging/docs/reference/tools/gcloud-logging

QUESTION 9
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 Stackdnver 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

Answer: C
Explanation:
Running Shutdown Scripts: Create and run shutdown scripts that execute commands right before an instance is terminated or restarted, on a best-effort basis. This is useful if you rely on automated scripts to start up and shut down instances, allowing instances time to clean up or perform tasks, such as exporting logs, or syncing with other systems.
https://cloud.google.com/compute/docs/shutdownscript
To setup Shutdown Scripts, go to GCP console and follow the steps:
Compute Engine -> VM instance -> Create Instance -> (Expand) Management, disks, networking, SSH keys
Enter the key "shutdown-script" and proper value

QUESTION 10
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.

Answer: AE
Explanation:
A is correct because BigQuery is the fully managed cloud data warehouse for analytics and supports the analytics requirement.
B is not correct because Cloud SOL does not support the expected 100 TB Additionally, Cloud SQL is a relational database and not the best fit for time-series log data formats
C Is not correct because Stackdriver is optimized for monitoring, error reporting, and debugging instead of analytics queries.
D is not correct because Cloud Bigtable is optimized for read-write latency and analytics throughput not analytics querying and reporting.
E is correct because Cloud Storage provides the Coldline storage class to support long-term storage with infrequent access, which would support the long-term disaster recovery backup requirement.

QUESTION 11
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.

Answer: C
Explanation:
The best practice when configuration a health check is to check health and serve traffic on the same port. However, it is possible to perform health checks on one port, but serve traffic on another. If you do use two different ports, ensure that firewall rules and services running on instances are configured appropriately. If you run health checks and serve traffic on the same port, but decide to switch ports at some point, be sure to update both the backend service and the health check.

Backend services that do not have a valid global forwarding rule referencing it will not be health checked and will have no health status.

References: https://cloud.google.com/compute/docs/load-balancing/http/backend-service

QUESTION 12
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

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

Good for:
- Low-latency read/write access
- High-throughput analytics
- Native time series support

Common workloads:
- IoT, finance, adtech
- Personalization, recommendations
- Monitoring
- Geospatial datasets
- Graphs

References: https://cloud.google.com/storage-options/

QUESTION 13
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.

Answer: C
Explanation:
A is not correct because increasing the memory size will not improve persistent disk throughput.
B is not correct because the DB administration team is requesting help with their MySQL instance Migration to a different product should not be the solution when other optimization techniques can still be applied first.
C is correct because persistent disk performance is based on the total persistent disk capacity attached to an instance and the number of vCPUs that the Instance has Incrementing the persistent disk capacity will increment ns throughput and IOPS, which In turn improve the performance of MySQL.
D is not correct because the DB administration team is requesting help with their MySQL instance Migration to a different product should not be the solution when other optimization techniques can still be applied first.

QUESTION 14
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

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

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

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

References: https://www.mongodb.com/nosql-explained

QUESTION 15
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

Answer: B

QUESTION 16
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.

Answer: BE
Explanation:
https://docs.microsoft.com/en-us/vsts/articles/security-validation-cicd-pipeline?view=vsts

QUESTION 17
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.

Answer: ABF
Explanation:
A (Correct answer) - Ensure that the load tests validate the performance of Cloud Bigtable.
At first thought, it seems Bigtable is managed service seamlessly scaling, there is no need to load test it. But you probably already know, there are many factors impacting the Bigtable performance. The common one of them, poorly designed table structure.
With poorly performed BigTable, the cluster would continue to scale, add more and more nodes, as the load increasing, cost more and more. Not matter how good is the cluster managed, this is exact situation that needs to prevent. In fact, tests validate the performance of Cloud Bigtable is one of the most important testing goals for BigTable performance.
B (Correct answer) - Create a separate Google Cloud project to use for the load-testing environment.
This is a good practice for least privileges and separation of responsibilities.
C - Schedule the load-testing tool to regularly run against the production environment.
You should not do load testing RGULARLY against production environment; In fact, somebody has suggested Load test in production should avoid entirely.
D - Ensure all third-party systems your services used are capable of handling high load
This is out of scope - it's beyond your control. You may test them, but you cannot control them. If you have doubts the third-party dependencies causing the overall performance issue, you may use integration test to identify and isolate them. This should not be your focus.
E - Instrument the production services to record every transaction for replay by the load-testing tool.
This would be way too much: not only the detailed instrumentation may impact the production performance, it's also possible the instrumentation itself distorts the test results - remember, Bigtable is for multiple terabyte or even petabyte NoSQL database for high throughput with low latency read and write.
F (Correct answer) - Instrument the load-testing tool and the target services with detailed logging and metrics collection.
This is normal requirement and practice for load testing to collect testing results with detailed measurable metric and historical logs otherwise load testing would be meaningless
More Resource
Understanding Cloud Bigtable Performance
https://cloud.google.com/bigtable/docs/performance

QUESTION 18
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.

Answer: D

QUESTION 19
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.

Answer: B
Explanation:
https://cloud.google.com/storage/docs/gcs-fuse

QUESTION 20
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
-d36f818a24b8cf1d (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.JarVerifiersVerifierStream.read
(JarVerifier.java:428)
     at sun.misc.Resource.getBytes
(Resource.java:124)
     at java.net.URL.ClassLoader.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
C. Recompile the CLoakedServlet class using and MD5 hash instead of SHA1

Answer: B

QUESTION 21
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

Answer: D
Explanation:
https://cloud.google.com/storage/docs/request-rate
Use a naming convention that distributes load evenly across key ranges
Auto-scaling of an index range can be slowed when using sequential names, such as object keys based on a sequence of numbers or timestamp. This occurs because requests are constantly shifting to a new index range, making redistributing the load harder and less effective.
In order to maintain a high request rate, avoid using sequential names. Using completely random object names will give you the best load distribution.

QUESTION 22
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 property 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.

Answer: C
Explanation:

Google Cloud Platform (GCP) HTTP(S) load balancing provides global load balancing for HTTP(S) requests destined for your instances.
The HTTP(S) load balancer has native support for the WebSocket protocol.

Incorrect Answers:
A: HTTP server push, also known as HTTP streaming, is a client-server communication pattern that sends information from an HTTP server to a client asynchronously, without a client request. A server push architecture is especially effective for highly interactive web or mobile applications, where one or more clients need to receive continuous information from the server.

References: https://cloud.google.com/compute/docs/load-balancing/http/

QUESTION 23
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.

Answer: CE
Explanation:
The speed of deployment can be changed by limiting the size of the uploaded app, limiting the complexity of the build necessary in the Dockerfile, if present, and by ensuring a fast and reliable internet connection.

Note: Alpine Linux is built around musl libc and busybox. This makes it smaller and more resource efficient than traditional GNU/Linux distributions. A container requires no more than 8 MB and a minimal installation to disk requires around 130 MB of storage. Not only do you get a fully-fledged Linux environment but a large selection of packages from the repository.

References: https://groups.google.com/forum/#!topic/google-appengine/hZMEkmmObDU
https://www.alpinelinux.org/about/

QUESTION 24
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.

Answer: D

QUESTION 25
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.

Answer: D
Explanation:
A is not correct because a single load balancer with URL maps is sufficient.
B is not correct because it goes against the requirements. The company wants to keep the old API available while new customers and testers try the new API.
C is not correct because it is not a requirement to decommission the implementation behind the old API Moreover, it introduces unnecessary risk in case bugs or incompatibilities are discovered in the new API.
D is correct because an HTTP(S) load balancer can direct traffic reaching a single IP to different backends based on the incoming URL.

QUESTION 26
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 Stackdnver Trace in order to break down the request latencies at each microservice.

Answer: D
Explanation:
https://cloud.google.com/trace/docs/overview

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.

Answer: D

QUESTION 28
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.

Answer: AC

QUESTION 29
An application development team believes their current logging tool will not meet their needs for their new cloud-based product. They want a bettor 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.

Answer: C
Explanation:
Help them define their requirements and assess viable logging tools. They know the requirements and the existing tools' problems. While it's true StackDriver Logging and Error Reporting possibly meet all their requirements, there might be other tools also meet their need. They need you to provide expertise to make assessment for new tools, specifically, logging tools that can "capture errors and help them analyze their historical log data"

QUESTION 30
A news teed 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.

Answer: A
Explanation:
https://stackoverflow.com/questions/3164280/google-app-engine-cache-list-in-session-variable?rq=1

QUESTION 31
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.

Answer: A
Explanation:
Google Big Query is for multi peta byte storage , HA(High availability) which means 24 hours, SQL interface .
https://medium.com/google-cloud/the-12-components-of-google-bigquery-c2b49829a7c7
https://cloud.google.com/solutions/bigquery-data-warehouse
https://cloud.google.com/bigquery/

QUESTION 32
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.

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

QUESTION 33
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 of 6,000 clicks per minute, with bursts of up to 8,500 clicks per second. It must been 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

Answer: B
Explanation:
Google Cloud Bigtable is a scalable, fully-managed NoSQL wide-column database that is suitable for both real-time access and analytics workloads.
Good for:
· Low-latency read/write access
· High-throughput analytics
· Native time series support
Common workloads:
· IoT, finance, adtech

- Personalization, recommendations
- Monitoring
- Geospatial datasets
- Graphs

Incorrect Answers:

C: Google Cloud Storage is a scalable, fully-managed, highly reliable, and cost-efficient object / blob store.
Is good for:
- Images, pictures, and videos
- Objects and blobs
- Unstructured data

D: Google Cloud Datastore is a scalable, fully-managed NoSQL document database for your web and mobile applications.
Is good for:
- Semi-structured application data
- Hierarchical data
- Durable key-value data
- Common workloads:
- User profiles
- Product catalogs
- Game state

References: https://cloud.google.com/storage-options/

QUESTION 34
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.

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

References: https://cloud.google.com/logging/

QUESTION 35
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

Answer: B
Explanation:
Cloud Dataflow is a fully-managed service for transforming and enriching data in stream (real time) and batch (historical) modes with equal reliability and expressiveness -- no more complex workarounds or compromises needed.
References: https://cloud.google.com/dataflow/

QUESTION 36
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.

Answer: C
Explanation:
Provision users to Google's directory
The global Directory is available to both Cloud Platform and G Suite resources and can be provisioned by a number of means. Provisioned users can take advantage of rich authentication features including single sign-on (SSO), OAuth, and two-factor verification.
You can provision users automatically using one of the following tools and services:

Google Cloud Directory Sync (GCDS)
Google Admin SDK
A third-party connector
GCDS is a connector that can provision users and groups on your behalf for both Cloud Platform and G Suite. Using GCDS, you can automate the addition, modification, and deletion of users, groups, and non-employee contacts. You can synchronize the data from your LDAP directory server to your Cloud Platform domain by using LDAP queries. This synchronization is one-way: the data in your LDAP directory server is never modified.

References: https://cloud.google.com/docs/enterprise/best-practices-for-enterprise-organizations#authentication-and-identity

QUESTION 37
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 is -lr gs://backups/** to find and remove items older than 90 days.
D. Schedule a cron script using gsutil ls -1 gs://backups/** to find and remove items older than 90 days and schedule it with cron.

Answer: B
Explanation:
https://cloud.google.com/storage/docs/gsutil/commands/lifecycle

QUESTION 38
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.

Answer: ACE

QUESTION 39
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.

Answer: B

QUESTION 40
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

Answer: C
Explanation:
https://cloud.google.com/docs/authentication/production#providing_credentials_to_your_applicati
on

QUESTION 41
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.

Answer: ADE
Explanation:
https://cloud.google.com/appengine/docs/standard/java/tools/uploadinganapp
https://cloud.google.com/appengine/docs/standard/java/building-app/cloud-sql

QUESTION 42
You want to enable your running Google Container Engine cluster to scale as demand for your application changes. What should you do?

A. ○ Add additional nodes to your Container Engine cluster using the following command:
```
gcloud container clusters resize CLUSTER_NAME --size 10
```

B. ○ Add a tag to the instances in the cluster with the following command:
```
gcloud compute instances add-tags INSTANCE --tags enable
-autoscaling max-nodes-10
```

C. ○ Update the existing Container Engine cluster with the following command:
```
gcloud alpha container clusters update mycluster --
enable-autoscaling --min-nodes=1 --max-nodes=10
```

D. ○ Create a new Container Engine cluster with the following command:
```
gcloud alpha container clusters create mycluster --
enable-autoscaling --min-nodes=1 --max-nodes=10
```
and redeploy your application.

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

Answer: C
Explanation:
https://cloud.google.com/kubernetes-engine/docs/concepts/cluster-autoscaler
To enable autoscaling for an existing node pool, run the following command:
gcloud container clusters update [CLUSTER_NAME] --enable-autoscaling \ --min-nodes 1 --max-nodes 10 --zone [COMPUTE_ZONE] --node-pool default- pool

QUESTION 43
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.

Answer: EF

QUESTION 44
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 gccloud with the command gcloud components install bq.

Answer: B
Explanation:
Applications that use BigQuery must be associated with a Google Cloud Platform Console project with the BigQuery API enabled.
Reference: https://cloud.google.com/bigquery/create-simple-app-api

QUESTION 45
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.

Answer: D
Explanation:
A is not correct because a single load balancer with URL maps is sufficient.
B is not correct because it goes against the requirements. The company wants to keep the old API available while new customers and testers try the new API.
C is not correct because it is not a requirement to decommission the implementation behind the old API Moreover, it introduces unnecessary risk in case bugs or incompatibilities are discovered in the new API.
D is correct because an HTTP(S) load balancer can direct traffic reaching a single IP to different backends based on the incoming URL.

QUESTION 46
Your organization has a 3-tier web application deployed in the same network on Google Cloud Platform. Each tier (web, API, and database) scales independently of the others Network traffic should flow through the web to the API tier and then on to the database tier. Traffic should not flow between the web and the database tier. How should you configure the network?

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

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

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

QUESTION 47
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.

Answer: AD

QUESTION 48
You want your Google Kubernetes Engine cluster to automatically add or remove nodes based on CPUload.
What should you do?

A. Configure a HorizontalPodAutoscaler with a target CPU usage. Enable the Cluster Autoscaler from the GCP Console.
B. Configure a HorizontalPodAutoscaler with a target CPU usage. Enable autoscaling on the managed instance group for the cluster using the gcloud command.
C. Create a deployment and set the maxUnavailable and maxSurge properties. Enable the Cluster Autoscaler using the gcloud command..
D. Create a deployment and set the maxUnavailable and maxSurge properties. Enable autoscaling on the cluster managed instance group from the GCP Console.

Answer: A

QUESTION 49
Your office is connected to GCP via a VPN connection. How can you increase the speed of your VPN connection, assuming that your office Internet is not the bottleneck?

A. Apply for a dedicated interconnect option
B. Enable high speed routing in your VPN settings
C. Create an additional VPN tunnel
D. Submit request to increase bandwidth quota

Answer: C
Explanation:
A - Apply for a dedicated interconnect option. A dedicated interconnect will also increase speeds, however the question asked how to speed up your VPN connection, not create a new type of connection.
C (Correct answer) - Create an additional VPN tunnel. Each VPN tunnel has a max speed of 1.5 Gbps. However, you can create multiple VPN tunnels to increase bandwidth.
Answer B and D either are not applicable or feature doesn't not exist.

QUESTION 50
As part of your backup plan, you set up regular snapshots of Compute Engine instances that are running. You want to be able to restore these snapshots using the fewest possible steps for replacement instances. What should you do?

A. Export the snapshots to Cloud Storage. Create disks from the exported snapshot files. Create images from the new disks.
B. Export the snapshots to Cloud Storage. Create images from the exported snapshot files.
C. Use the snapshots to create replacement disks. Use the disks to create instances as needed.
D. Use the snapshots to create replacement instances as needed.

Answer: D
Explanation:

D (Correct Answer) - D is correct because the scenario asks how to recreate instances.
A, B, and C are not correct because the Google best practice of creating images from running Compute Engine instances is to first take a snapshot, export it to Cloud Storage, and then import that file as the basis for a custom image for use in DR scenarios
Reference:
Choosing a storage option https://cloud.google.com/storage-options/
Based on TerramEarth's current data flow environment (refer to the image in the case study), what are the direct GCP services

QUESTION 51
Case Study: 1 - Mountkirk Games Case Study
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 Linx 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, resuming 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 gams 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.

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.

Answer: A
Explanation:
From Scenario:
A few of their games were more popular than expected, and they had problems scaling their application servers, MySQL databases, and analytics tools.
Requirements for Game Analytics Platform include: Dynamically scale up or down based on game activity

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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.

Answer: A
Explanation:
From scenario: Requirements for Game Backend Platform
1. Dynamically scale up or down based on game activity
2. Connect to a managed NoSQL database service
3. Run customize Linux distro

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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
E. Container Registry, Google Kubernetes Engine, Cloud Load Balancing

Answer: E
Explanation:
Google Cloud Functions is a serverless environment to build and connect cloud services.
Google Cloud Pub/Sub brings the scalability, flexibility, and reliability of enterprise message-oriented middleware to the cloud. By providing many-to-many, asynchronous messaging that decouples senders and receivers, it allows for secure and highly available communication between independently written applications. Google Cloud Pub/Sub delivers low-latency, durable messaging that helps developers quickly integrate systems hosted on the Google Cloud Platform and externally.
Incorrect Answers:
A: Cloud Dataflow is a fully-managed service for transforming and enriching data in stream (real time) and batch (historical) modes.
C: Store your private Docker container images on Cloud Platform for fast, scalable retrieval and deployment. Container Registry is a private Docker repository that works with popular continuous delivery systems. It runs on Cloud Platform to provide consistent uptime on an infrastructure protected by Google's security. You pay only for storage and internet egress you use, there is no per-image fee.
Reference: https://cloud.google.com/load-balancing/
https://cloud.google.com/solutions/ansible-with-spinnaker-tutorial
http://blog.armory.io/what-is-immutable-infrastructure/
https://cloud.google.com/compute/docs/load-balancing/http/

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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 Linx 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, resuming 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 gams 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.

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.

Answer: B

QUESTION 55
Case Study: 1 - Mountkirk Games Case Study
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 Linx 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

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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.

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.

Answer: A
Explanation:
https://cloud.google.com/appengine/docs/standard/go/creating-separate-dev-environments

QUESTION 56
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

Answer: B
Explanation:
Ingest millions of streaming events per second from anywhere in the world with Cloud Pub/Sub, powered by Google's unique, high-speed private network. Process the streams with Cloud Dataflow to ensure reliable, exactly-once, low-latency data transformation. Stream the transformed data into BigQuery, the cloud-native data warehousing service, for immediate analysis via SQL or popular visualization tools.
From scenario: They plan to deploy the game's backend on Google Compute Engine so they can capture streaming metrics, run intensive analytics.
Requirements for Game Analytics Platform

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

References: https://cloud.google.com/solutions/big-data/stream-analytics/

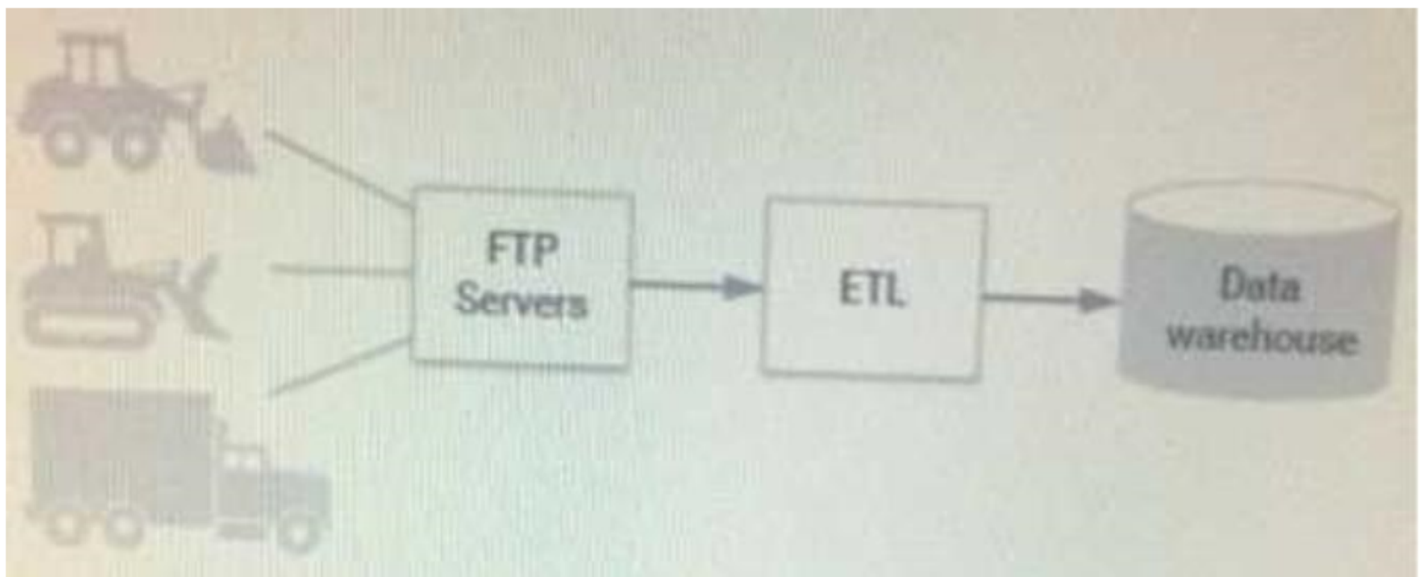
QUESTION 57
Case Study: 2 - TerramEarth Case Study

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 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



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

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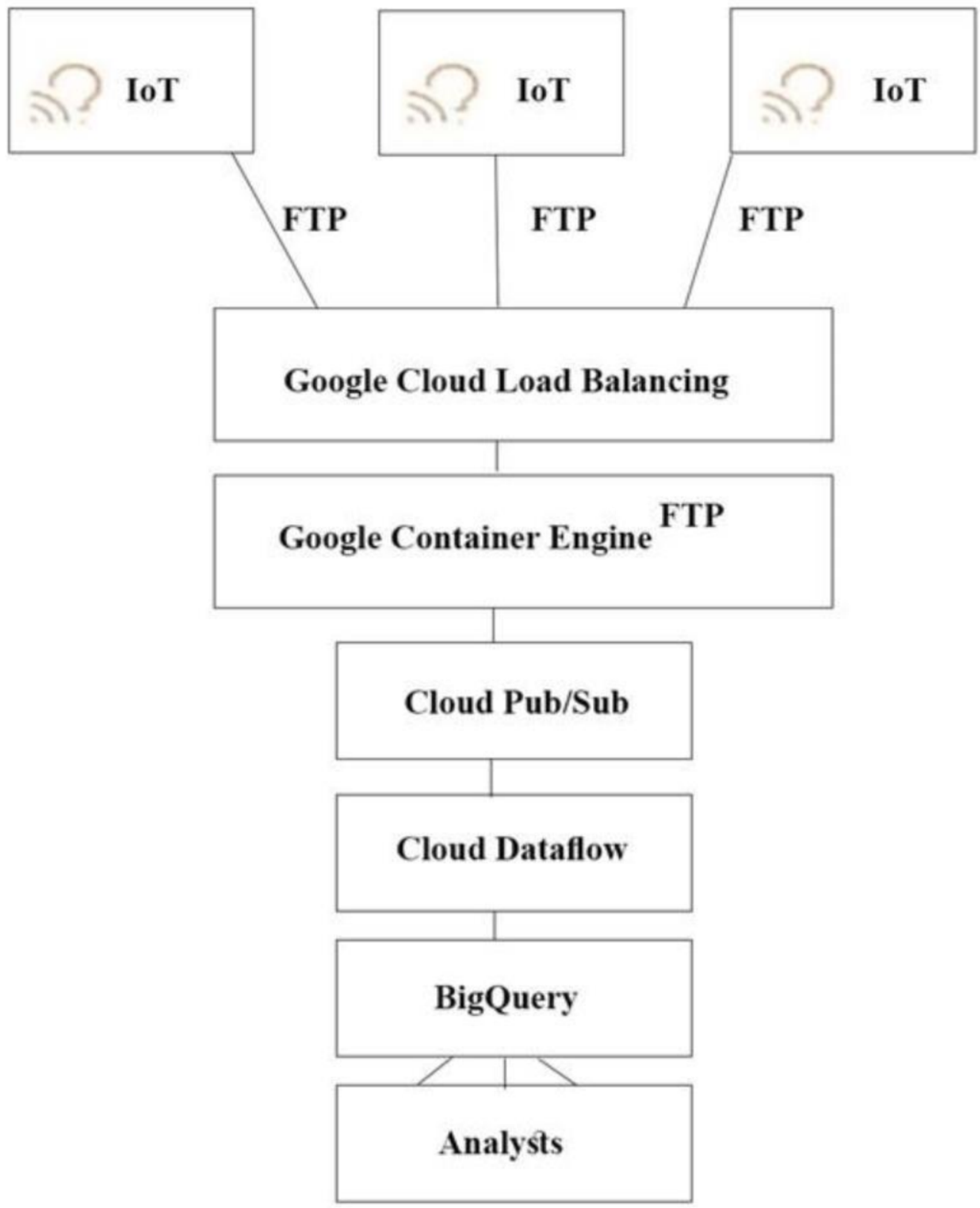
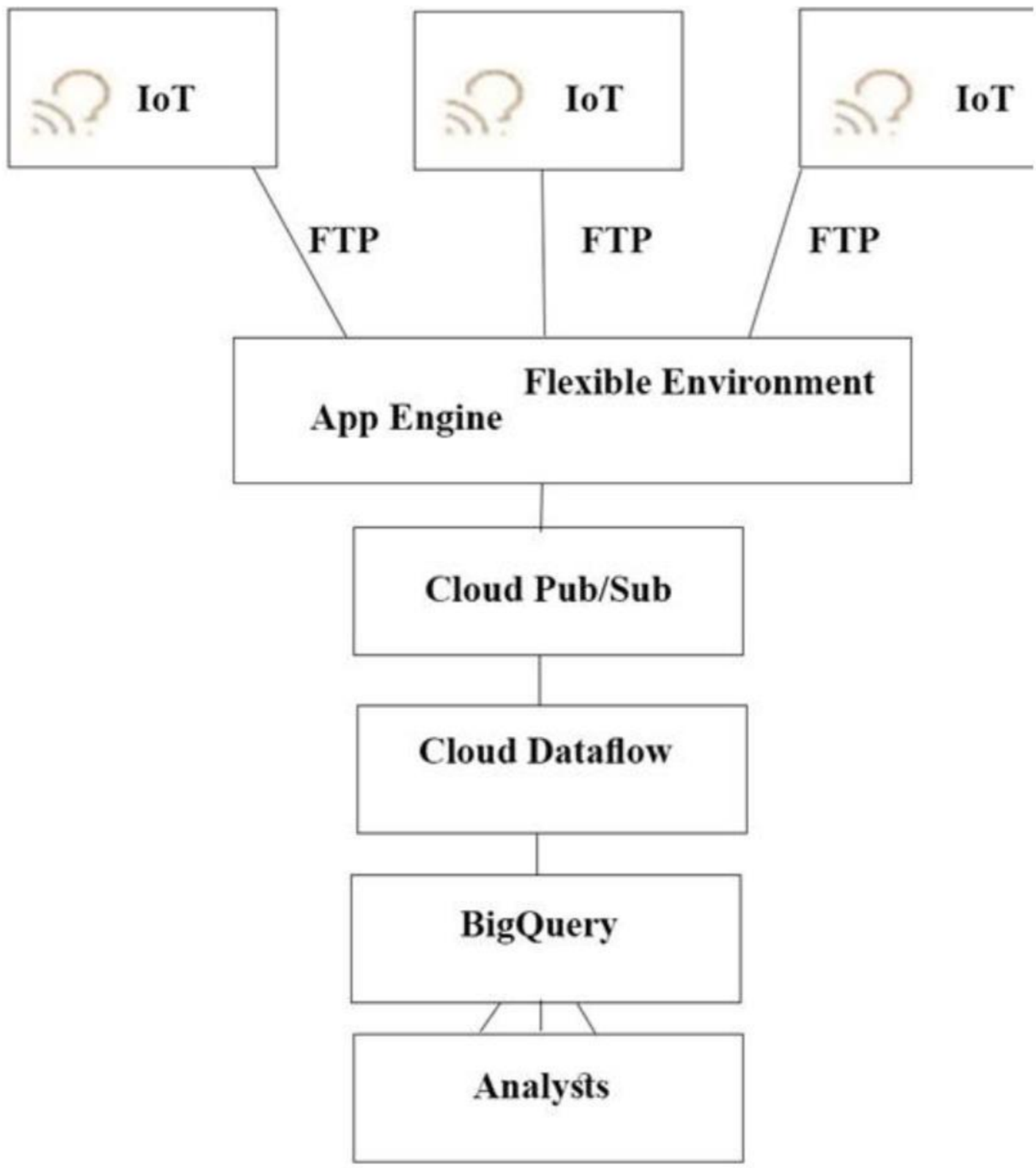
CTO Statement
Our competitive advantage has always been in the manufacturing process with our ability to build better vehicles for tower cost than our competitors. However, new products with different approaches are constantly being developed, and I'm concerned that we lack the skills to undergo the 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.

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?

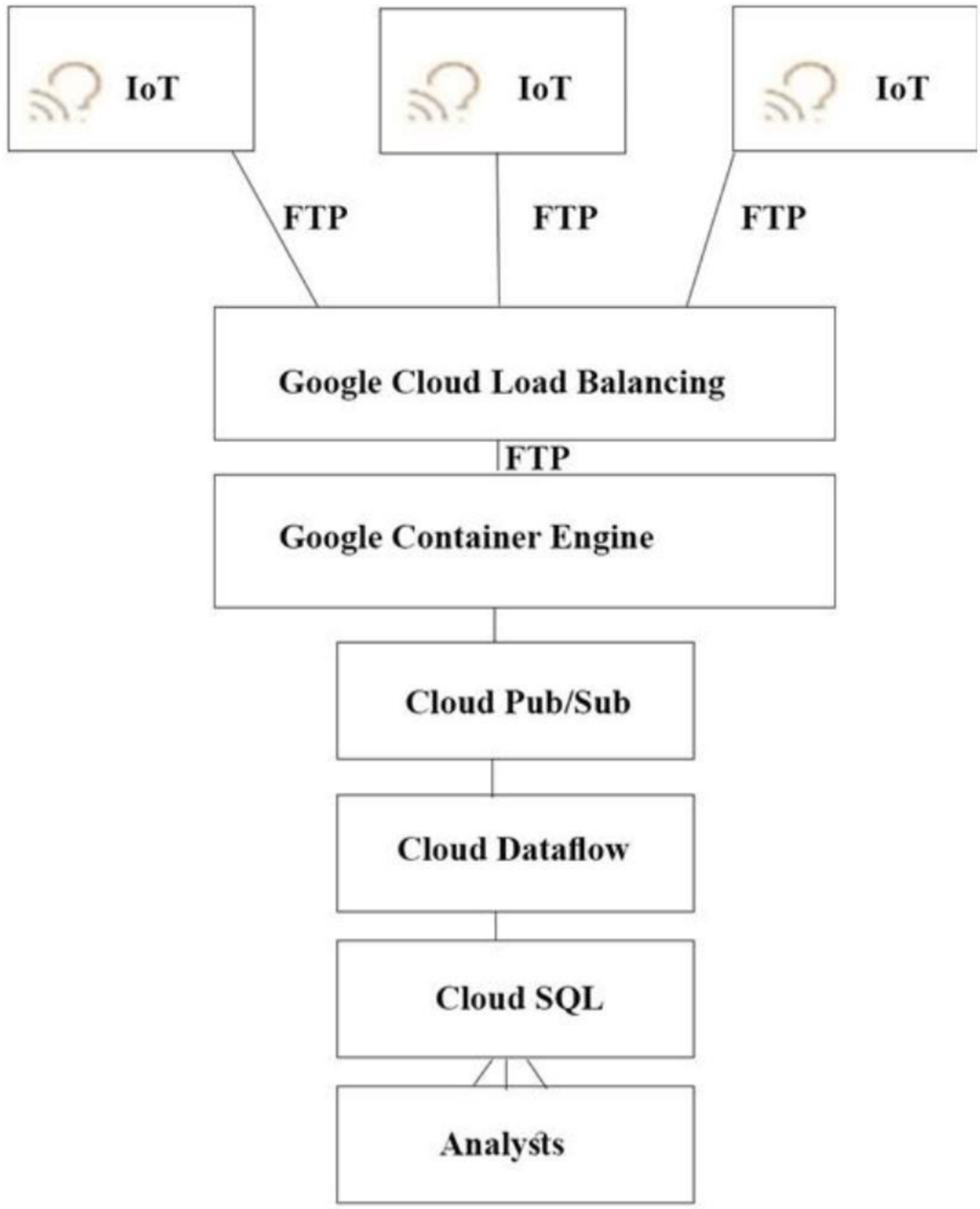
A.


IoT
IoT
IoT
FTP
FTP
FTP
Google Cloud Load Balancing
Google Container Engine
FTP
Cloud Pub/Sub
Cloud Dataflow
BigQuery
Analysts

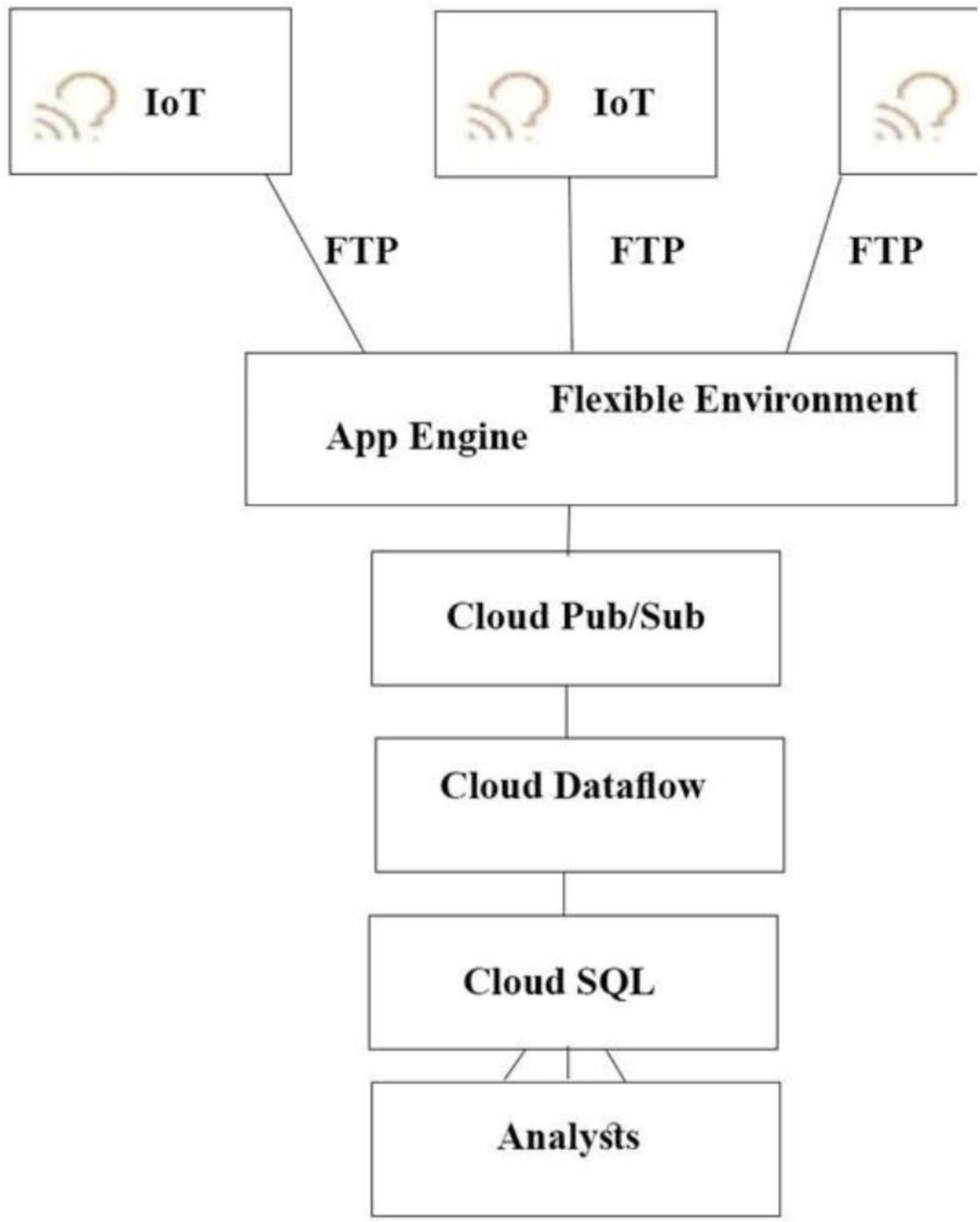
B.


IoT
IoT
IoT
FTP
FTP
FTP
Flexible Environment
App Engine
Cloud Pub/Sub
Cloud Dataflow
BigQuery
Analysts

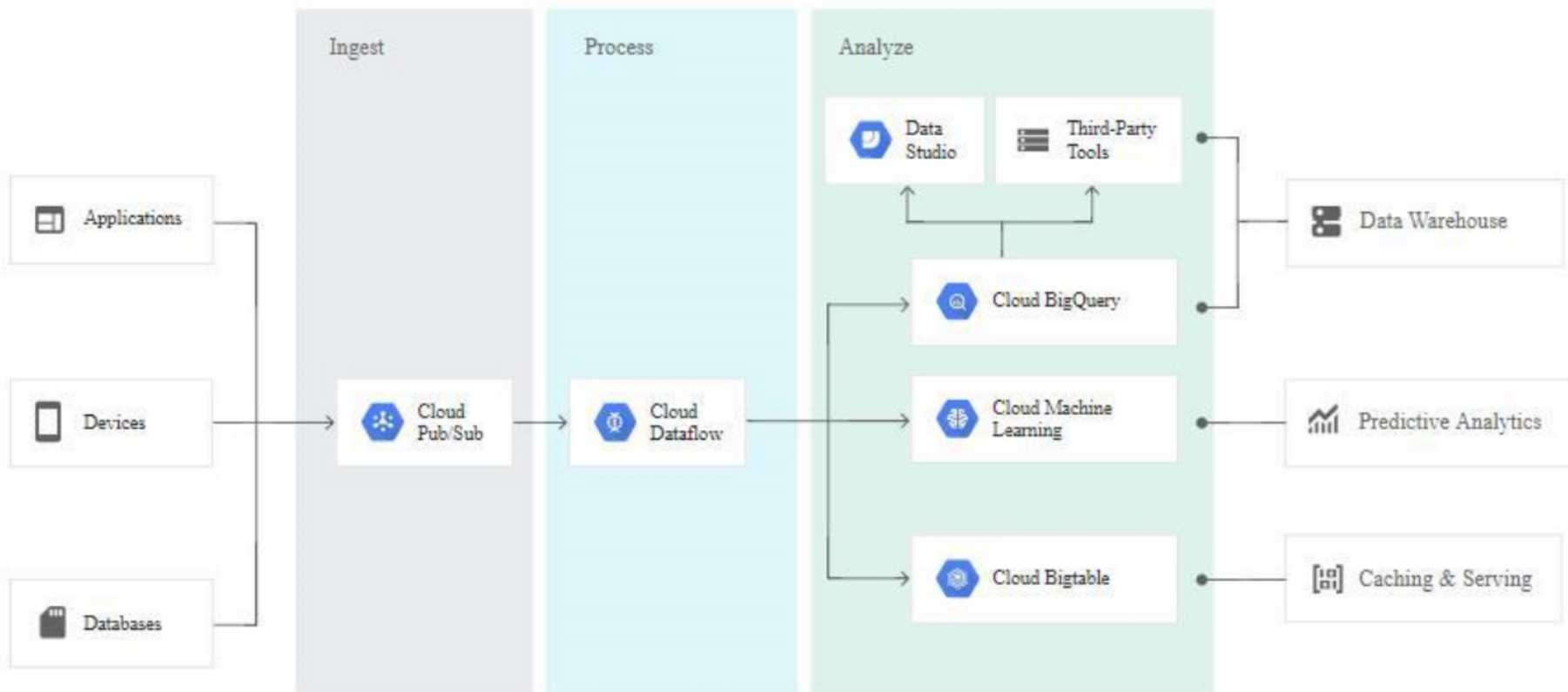
C.


IoT
IoT
IoT
FTP
FTP
FTP
Google Cloud Load Balancing
FTP
Google Container Engine
Cloud Pub/Sub
Cloud Dataflow
Cloud SQL
Analysts

D.



Answer: A
Explanation:
The push endpoint can be a load balancer.
A container cluster can be used.
Cloud Pub/Sub for Stream Analytics



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https://cloud.google.com/solutions/iot/
https://cloud.google.com/solutions/designing-connected-vehicle-platform
https://cloud.google.com/solutions/designing-connected-vehicle-platform#data_ingestion
http://www.eweek.com/big-data-and-analytics/google-touts-value-of-cloud-iot-core-for-analyzing-connected-car-data
https://cloud.google.com/solutions/iot/

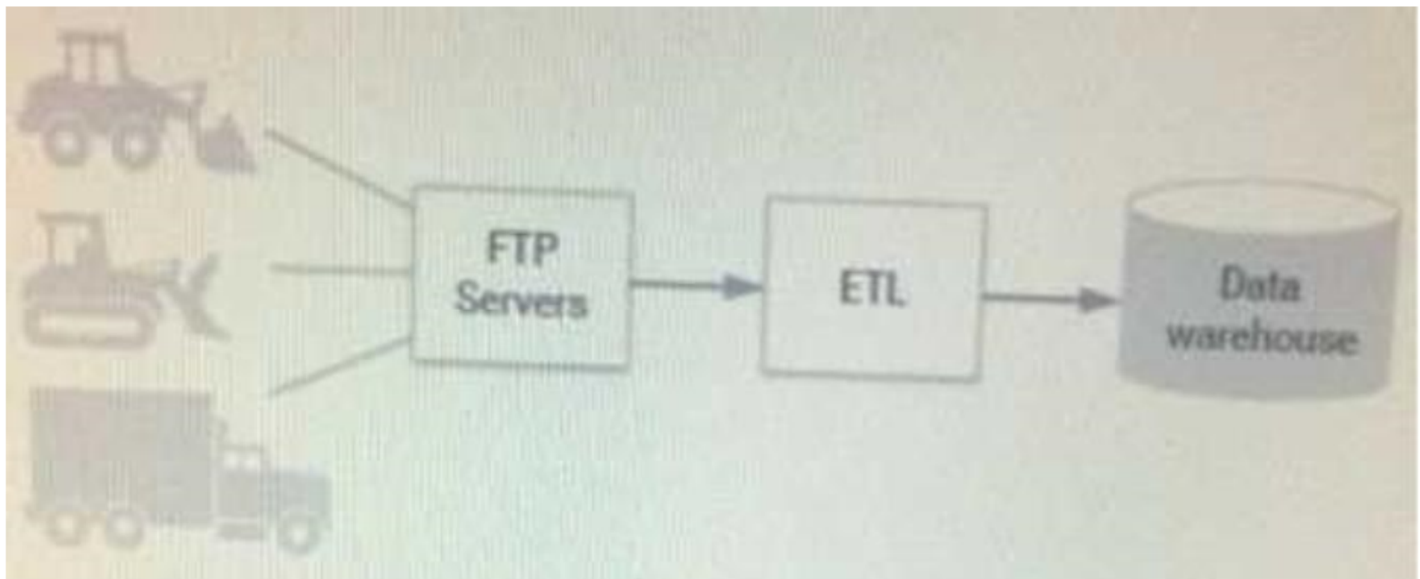
QUESTION 58
Case Study: 2 - TerramEarth Case Study

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 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 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.

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.

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

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

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

QUESTION 59
Case Study: 2 - TerramEarth Case Study

Company Overview
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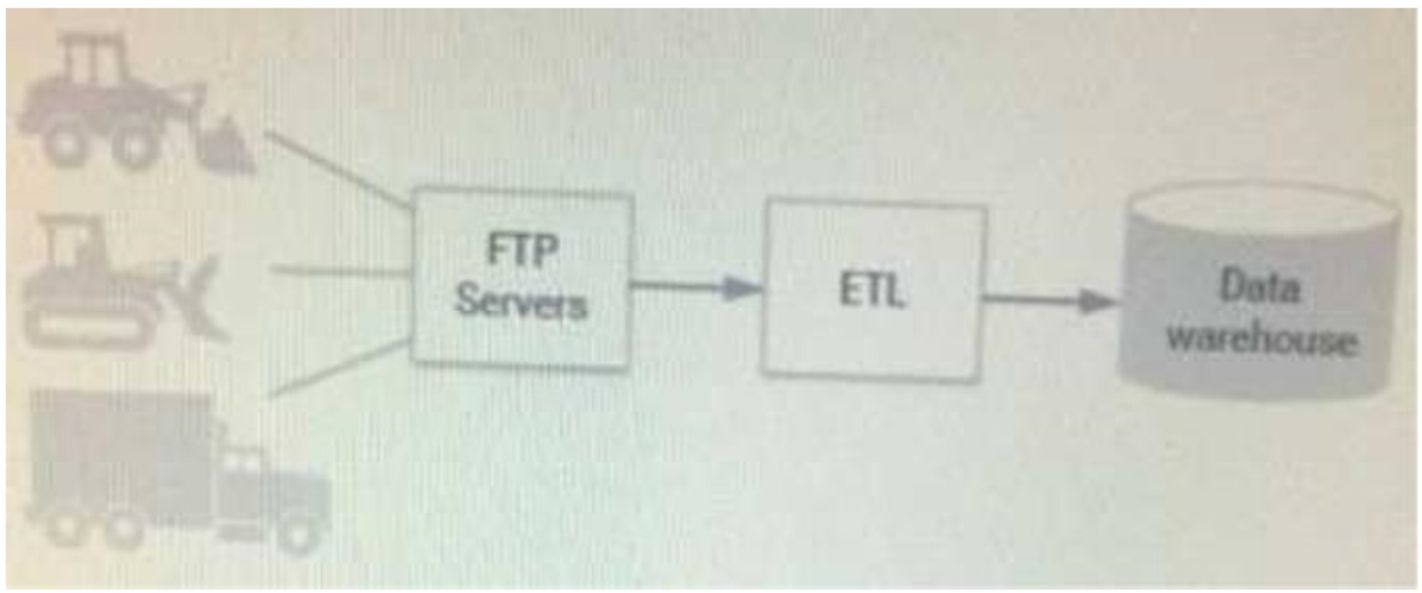
Existing Technical Environment



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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.

Answer: A
Explanation:
Delegate application authorization with OAuth2

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

References: 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 60
Case Study: 2 - TerramEarth Case Study

Company Overview
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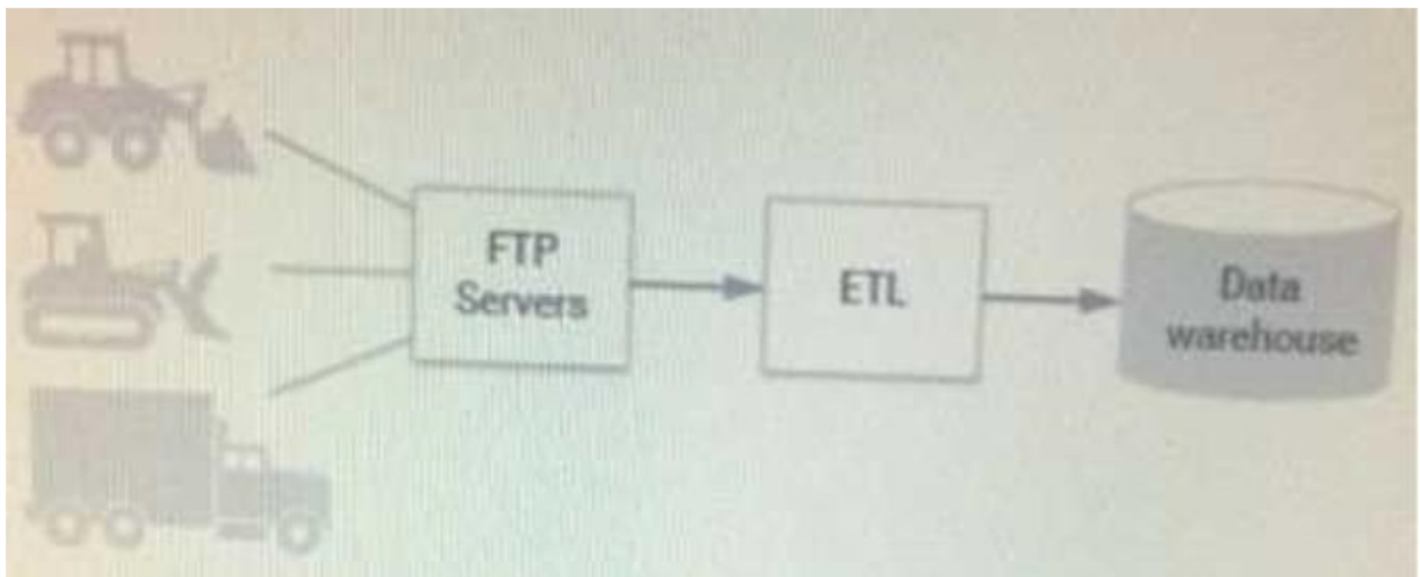

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For this question, refer to the TerramEarth case study. TerramEarth plans to connect all 20 million vehicles in the field to the cloud. This increases the volume to 20 million 600 byte records a second for 40 TB an hour. How should you design the data 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).

Answer: B
Explanation:
Streamed data is available for real-time analysis within a few seconds of the first streaming insertion into a table.

Instead of using a job to load data into BigQuery, you can choose to stream your data into BigQuery one record at a time by using the tabledata().insertAll() method. This approach enables querying data without the delay of running a load job.

References: https://cloud.google.com/bigquery/streaming-data-into-bigquery

QUESTION 61
Case Study: 2 - TerramEarth Case Study

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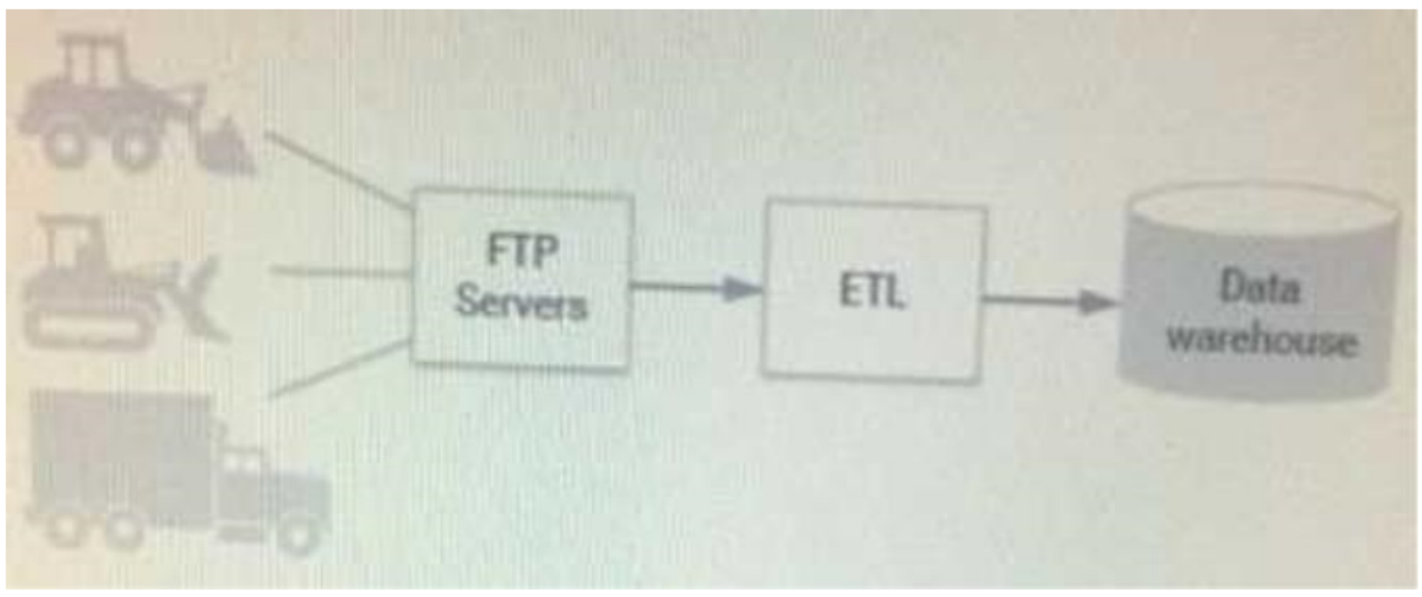

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CTO Statement
Our competitive advantage has always been in the manufacturing process with our ability to build better vehicles for tower cost than our competitors. However, new products with different approaches are constantly being developed, and 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.

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.

Answer: C
Explanation:
B - Migrate from FTP to streaming transport, migrate from CSV to binary format, and develop machine learning analysis of metrics.

If no cellular connection, then it cannot do streaming; CVS to binary does not necessary reduce the size (compress does).
C (Correct answer) - Increase fleet cellular connectivity to 80%, migrate from FTP to streaming transport, and develop machine learning analysis of metrics.
TerramEarth Existing Technical Environment New Solution: 80% going to streaming; 20% goes to Batch; No FTP
GCP offers many ways to connect to PubSub and GCS such as IOT Type, rich client library, as well as gsutil for reliable, parallel, resumable upload data
By increase fleet cellular connectivity to 80%, migrating from FTP to streaming transport, and the rest of 20% batch users for Cloud storage upload instead of FTP, majority of bottlenecked areas are covered and resolved.
A and D can be eliminated for "Migrate from FTP to SFTP transport" since SFTP doesn't provide speed advantage over FTP nor the better solution with streaming.

QUESTION 62
Case Study: 2 - TerramEarth Case Study

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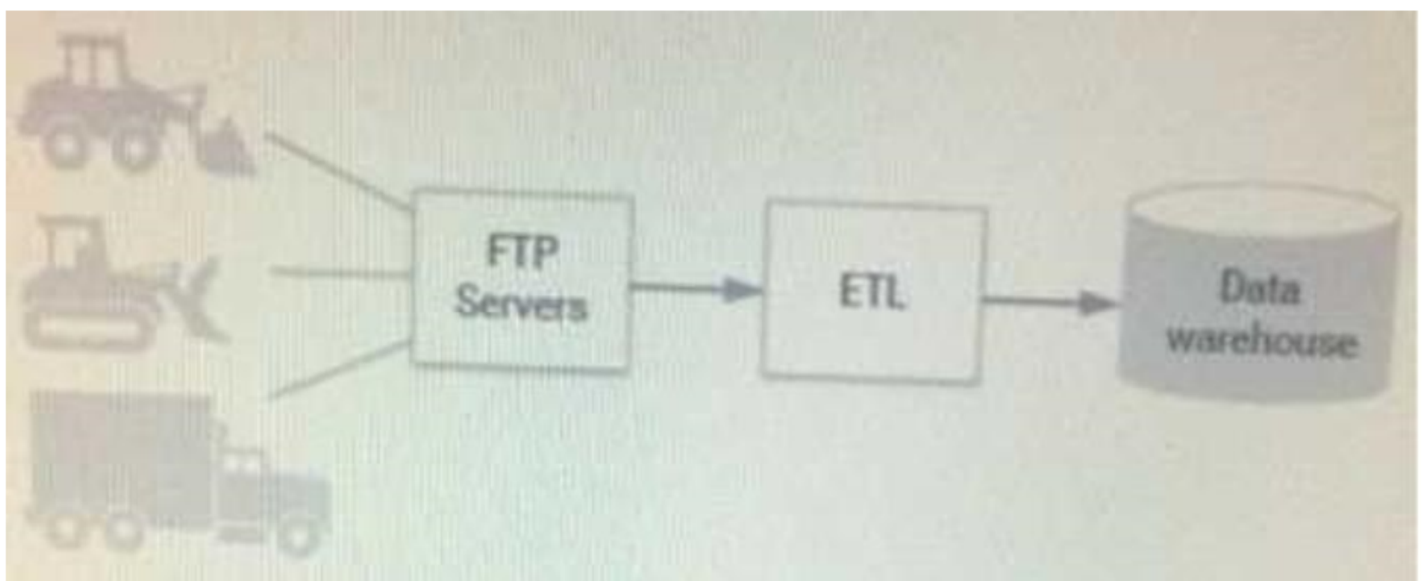
Solution Concept
There are 20 million TerramEarth vehicles in operation that collect 120 fields of data per second. Data is stored locally on the vehicle and can be accessed for analysis when a vehicle is serviced. The data is downloaded via a maintenance port. This same port can be used to adjust operational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



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Business Requirements
- Decrease unplanned vehicle downtime to less than 1 week, without increasing the cost of carrying surplus inventory
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CEO Statement
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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.

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

Answer: B

QUESTION 63
Case Study: 2 - TerramEarth Case Study

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Company Background
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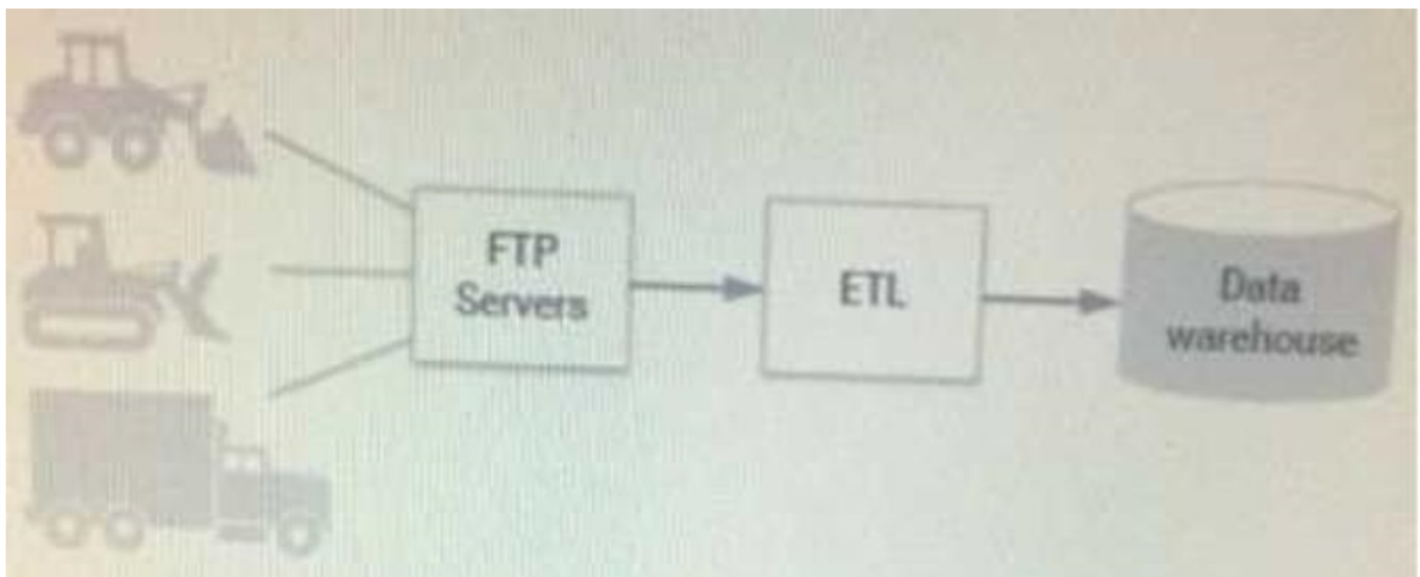
Solution Concept
There are 20 million TerramEarth vehicles in operation that collect 120 fields of data per second. Data is stored locally on the vehicle and can be accessed for analysis when a vehicle is serviced. The data is downloaded via a maintenance port. This same port can be used to adjust operational 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



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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 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
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CTO Statement
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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.

Answer: C

QUESTION 64
Case Study: 2 - TerramEarth Case Study

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Solution Concept
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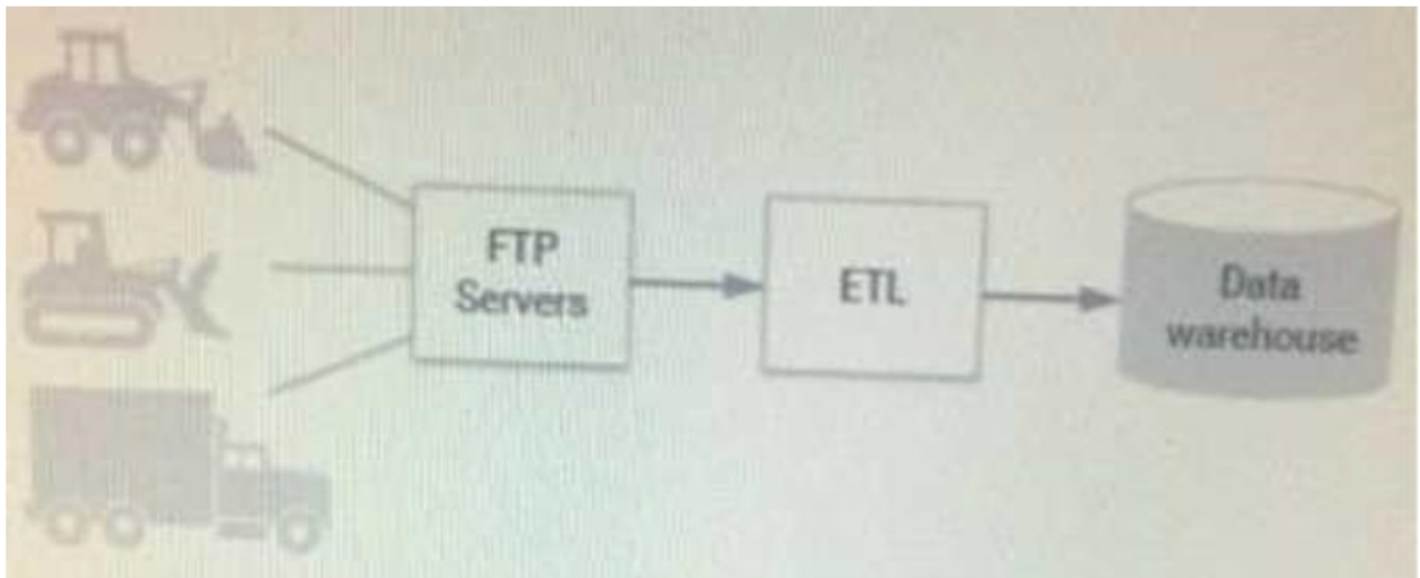
Data is stored locally on the vehicle and can be accessed for analysis when a vehicle is serviced. The data is downloaded via a maintenance port. This same port can be used to adjust operational parameters, allowing the vehicles to be upgraded in the field with new computing modules. Approximately 200,000 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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incremental innovations.

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 to finish the job.

Answer: D
Explanation:
Compressed Data save $$$
Region bucket cheaper than Multi Region
References: https://medium.com/google-cloud/google-cloud-storage-what-bucket-class-for-the-bestperformance-5c847ac8f9f2

QUESTION 65
Case Study: 2 - TerramEarth Case Study

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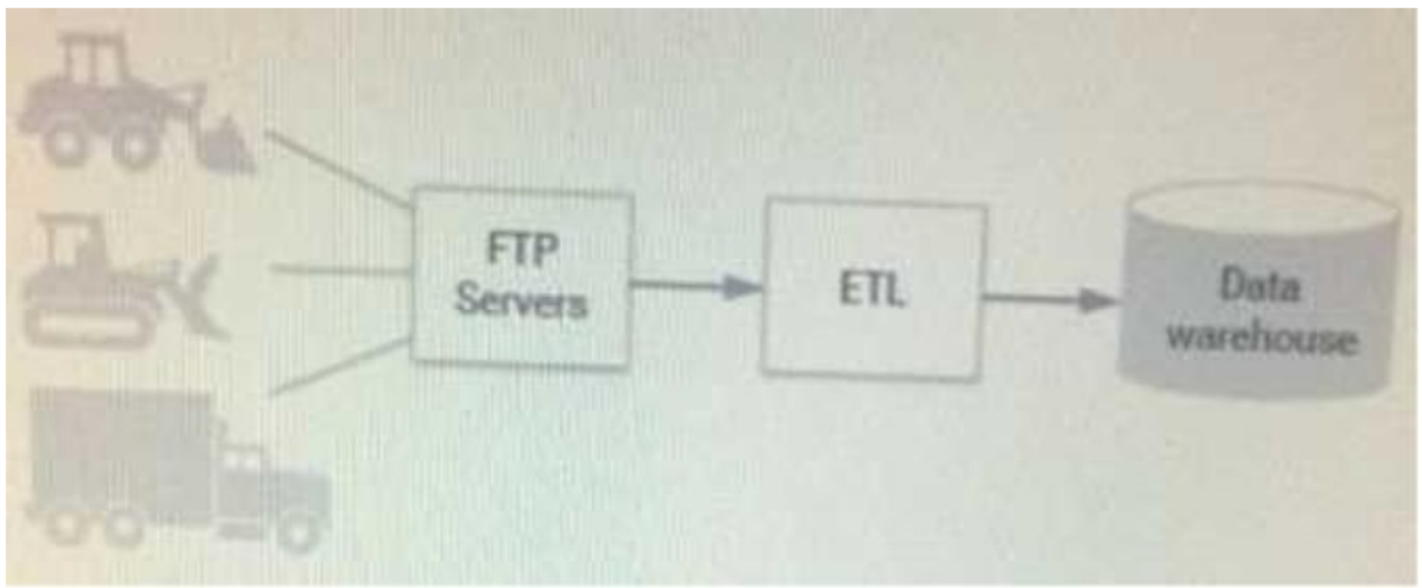

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For this question, refer to the TerramEarth case study. TerramEarth has equipped unconnected trucks with servers and sensors to collet telemetry data. Next year they want to use the data to train machine learning models. They want to store this data in the cloud while reducing costs. What should they do?

A. Have the vehicle' 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, a Store it in a GCS Coldline bucket.

Answer: B
Explanation:
Answer should be B - Why would you collect data in Coldline when the purpose is to collect data to analysis down the line and cost wise it should be similar to store such large volume in BQ instead of COldline given the Data access cost involved. ML can be directly done on BQ instead of pulling this data from Coldline into another DB and then applying ML algos on the data which will be more expensive to achieve

QUESTION 66
Case Study: 2 - TerramEarth Case Study

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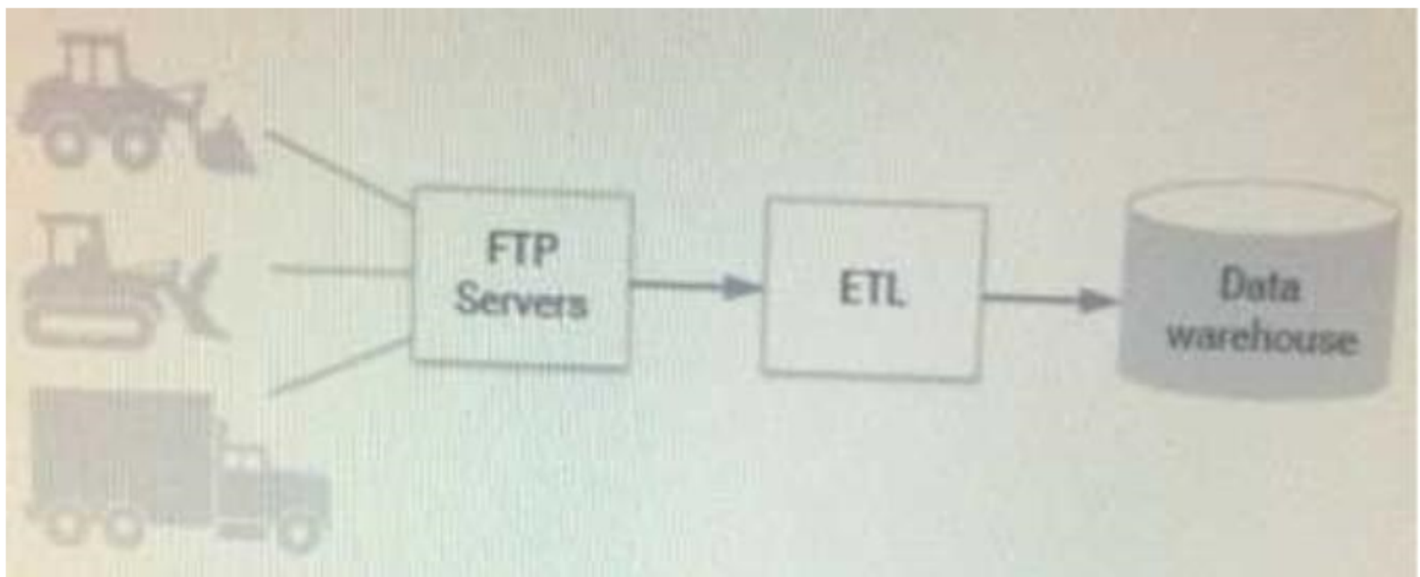

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For this question refer to the TerramEarth case study
Operational parameters such as oil pressure are adjustable on each of TerramEarth's vehicles to increase their efficiency, depending on their environmental conditions. Your primary goal is to increase 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.

Answer: D
Explanation:
https://cloud.google.com/customers/ocado/

QUESTION 67
Case Study: 3 - JencoMart Case Study

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
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 availably 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 polices.

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.

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.

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

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

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

QUESTION 68
Case Study: 3 - JencoMart Case Study

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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 availably 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

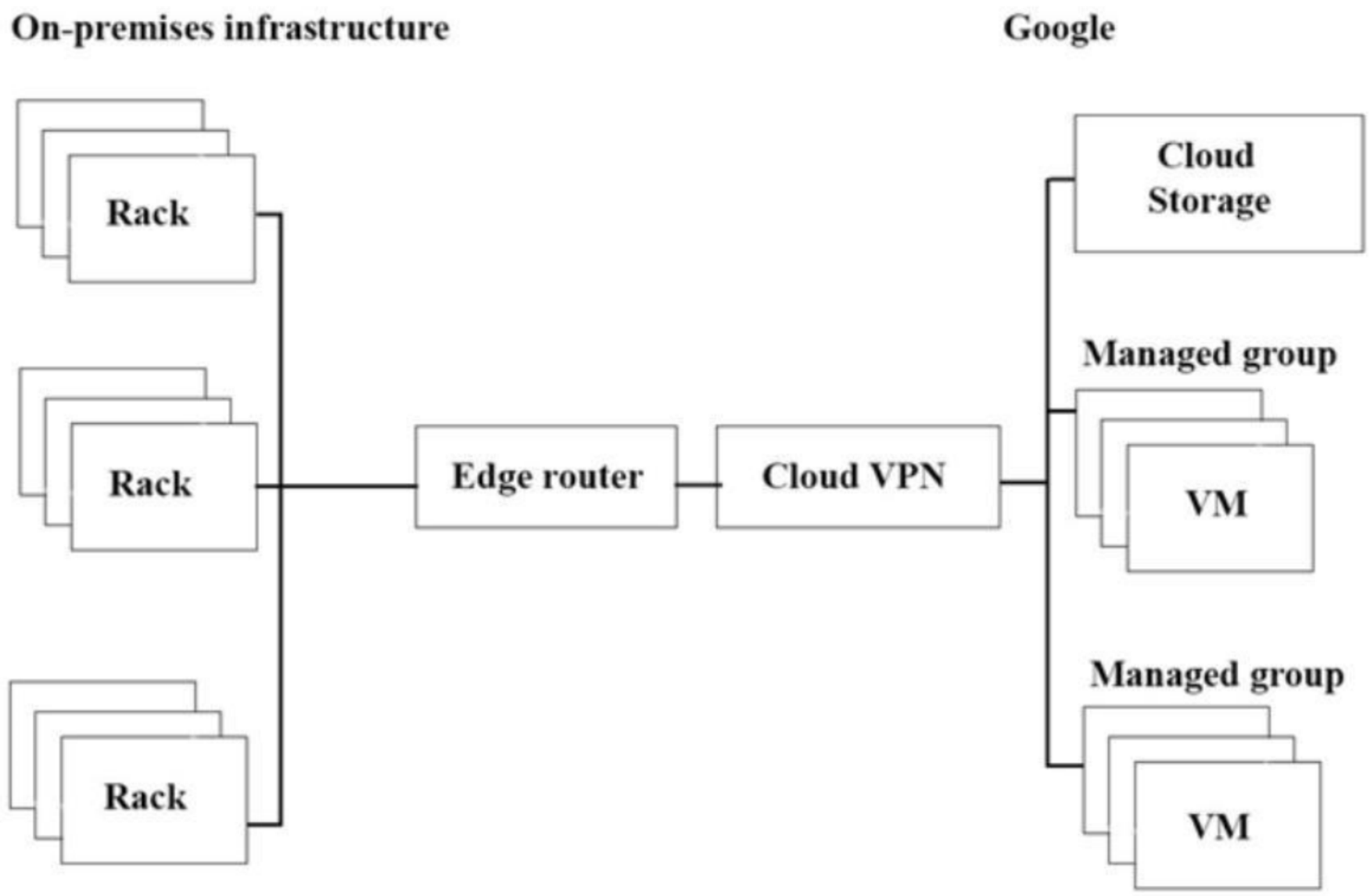
CEO Statement
JencoMart will continue to develop personal relationships with our customers as more people access the web. The future of our retail business is in the global market and the connection between online and in-store experiences. As a large global company, we also have a responsibility to the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

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.

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

Answer: ACF

QUESTION 69
Case Study: 3 - JencoMart Case Study

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.

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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
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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.

Answer: CDF
Explanation:
D: Handling "Unable to connect on port 22" error message
Possible causes include:
- There is no firewall rule allowing SSH access on the port. SSH access on port 22 is enabled on all Compute Engine instances by default. If you have disabled access, SSH from the Browser will not work. If you run sshd on a port other than 22, you need to enable the access to that port with a custom firewall rule.
- The firewall rule allowing SSH access is enabled, but is not configured to allow connections from GCP Console services. Source IP addresses for 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.
References:
https://cloud.google.com/compute/docs/ssh-in-browser
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QUESTION 70
Case Study: 3 - JencoMart Case Study

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.

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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

Answer: D
Explanation:
Common workloads for Google Cloud Datastore:
· User profiles
· Product catalogs
· Game state
References: https://cloud.google.com/storage-options/
https://cloud.google.com/datastore/docs/concepts/overview

QUESTION 71
Case Study: 3 - JencoMart Case Study

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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.

Answer: A
Explanation:
A) (correct answer) This addresses both of data migration and application server migration properly.
"Provision service account keys for the on-premises infrastructure": For code running on systems outside Google, you cannot use GCP-managed keys. You need to create Service account for it and provision User-managed keys. These keys are created, downloadable, and managed by users - This is solution for on-premises access to GCP datastore during migration
"use Google Cloud Platform (GCP) managed keys for the VMs" - this is solution for Application server migration since there is no external access to GCP is required during the migration.
Answer B is incorrect: First, the applications running on-premises to access GCP Datastore assume the identity of the service account to call Google APIs, so that the users aren't directly involved.

Secondly, for the application server migration to GCP VMs, you can use GCP managed keys for the VMs. It's simple and effective. There is no need to provision and manage keys (User-managed keys) by yourself for the VMs.
GCP-managed keys are used by Cloud Platform services such as App Engine and Compute Engine. These keys cannot be downloaded. Google will keep the keys and automatically rotate them on an approximately weekly basis.
C) is incorrect in the solution for on-premises access to GCP Datastore - This is possible options that might require more setup than worthwhile for the requirements.
D) is incorrect for reason of application server migration: you can use GCP managed keys for the VMs. It's simple and effective. There is no need to provision and manage keys (User-managed keys) by yourself for the application VMs

QUESTION 72
Case Study: 3 - JencoMart Case Study

Company Overview
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• Tape backup every week

Business Requirements
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• Expand services into Asia.

Technical Requirements
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• Modify application for the cloud.
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• Leverage managed services wherever feasible
• Sunset 20% of capacity in existing data centers
• Decrease latency in Asia

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CFO Statement
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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

Answer: C
Explanation:
From scenario:
Business Requirements include: Expand services into Asia
Technical Requirements include: Decrease latency in Asia

QUESTION 73
Case Study: 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:
- 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.

For this question, refer to the Dress4Win case study.
At Dress4Win, an operations engineer wants to create a tow-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.

Answer: A
Explanation:
Follow these rules of thumb when deciding whether to use gsutil or Storage Transfer Service:
When transferring data from an on-premises location, use gsutil.

When transferring data from another cloud storage provider, use Storage Transfer Service. Otherwise, evaluate both tools with respect to your specific scenario.
Use this guidance as a starting point. The specific details of your transfer scenario will also help you determine which tool is more appropriate

QUESTION 74
Case Study: 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.

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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.

Answer: D

QUESTION 75
Case Study: 4 - Dress4Win case study

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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.

Answer: B

QUESTION 76
Case Study: 4 - Dress4Win case study

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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)

Answer: B

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Case Study: 4 - Dress4Win case study

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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 Bigtabte 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.

Answer: A
Explanation:
References: https://cloud.google.com/storage/docs/storage-classes

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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.

Answer: B
Explanation:
B is correct answer because the question asks about additional methods to prevent an outage. If they have already 100% coverage than they are smart enough to run those test on new platform as C describes.

QUESTION 79
Case Study: 4 - Dress4Win case study

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For this question, refer to the Dress4Win case study.
As part of their new application experience, Dress4Wm allows customers to upload images of themselves. The customer has exclusive control over who may view these images. Customers should be able to upload images with minimal latency and also be shown their images quickly on the main application page when they log in. Which configuration should Dress4Win use?

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

Answer: B

QUESTION 80
Case Study: 4 - Dress4Win case study

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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.

Answer: B

QUESTION 81
Case Study: 4 - Dress4Win case study

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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.

Answer: A

QUESTION 82
Case Study: 4 - Dress4Win case study

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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

Answer: C

QUESTION 83
You created a pipeline that can deploy your source code changes to your infrastructure in instance groups for self-healing. One of the changes negatively affects your key performance indicator. You are not sure how to fix it, and investigation could take up to a week.

What should you do?

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

Answer: B

QUESTION 84
Your organization wants to control IAM policies for different departments independently, but centrally.

Which approach should you take?

A. Multiple Organizations with multiple Folders
B. Multiple Organizations, one for each department
C. A single Organization with Folders for each department
D. A single Organization with multiple projects, each with a central owner

Answer: C
Explanation:
Folders are nodes in the Cloud Platform Resource Hierarchy. A folder can contain projects, other folders, or a combination of both. You can use folders to group projects under an organization in a hierarchy. For example, your organization might contain multiple departments, each with its own set of GCP resources. Folders allow you to group these resources on a per-department basis. Folders are used to group resources that share common IAM policies. While a folder can contain multiple folders or resources, a given folder or resource can have exactly one parent.
References: https://cloud.google.com/resource-manager/docs/creating-managing-folders

QUESTION 85
You want to make a copy of a production Linux virtual machine in the US-Central region. You want to manage and replace the copy easily if there are changes on the production virtual machine. You will deploy the copy as a new instance in a different project in the US-East region. What steps must you take?

A. Use the Linux dd and netcat commands to copy and stream the root disk contents to a new virtual machine instance in the US-East region.
B. Create a snapshot of the root disk and select the snapshot as the root disk when you create a new virtual machine instance in the US-East region.
C. Create an image file from the root disk with Linux dd command, create a new 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.

Answer: D
Explanation:
A) This approach affects performance of the existing machine and incurs significant network costs.
B) This approach does not allow you to create the VM in the new project since snapshots are limited to the project in which they are taken.
C) dd will not work correctly on a mounted disk.
D) (Correct Answer) - This approach meets all of the requirements, it is easy to do and works cross project and cross region.
Reference Resources:
https://cloud.google.com/compute/docs/images/sharing-images-across-projects

QUESTION 86
You are designing a mobile chat application. You want to ensure people cannot spoof chat messages, by providing a message were sent by a specific user.

What should you do?

A. Tag messages client side with the originating user identifier and the destination user.
B. Encrypt the message client side using block-based encryption with a shared key.
C. Use public key infrastructure (PKI) to encrypt the message client side using the originating user's private key.
D. Use a trusted certificate authority to enable SSL connectivity between the client application and the server.

Answer: C
Explanation:
It is C as client side should encrypt the message using originating cert.

QUESTION 87
As part of implementing their disaster recovery plan, your company is trying to replicate their production MySQL database from their private data center to their GCP project using a Google Cloud VPN connection. They are experiencing latency issues and a small amount of packet loss that is disrupting the replication. What should they do?

A. Configure their replication to use UDP.
B. Configure a Google Cloud Dedicated Interconnect.
C. Restore their database daily using Google Cloud SQL.
D. Add additional VPN connections and load balance them.
E. Send the replicated transaction to Google Cloud Pub/Sub.

Answer: B

QUESTION 88
Case Study: 5 - Dress4win

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

Existing Technical Environment

The Dress4win application is served out of a single data center location. All servers run Ubuntu LTS v16.04.

Databases:
- MySQL. 1 server for user data, inventory, static data:
  - MySQL 5.8
  - 8 core CPUs
  - 128 GB of RAM
  - 2x 5 TB HDD (RAID 1)

- Redis 3 server cluster for metadata, social graph, caching. Each server is:
  - Redis 3.2
  - 4 core CPUs
  - 32GB of RAM

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

- 20 Apache Hadoop/Spark servers:
  - Data analysis
  - Real-time trending calculations
  - 8 core CPUS
  - 128 GB of RAM
  - 4x 5 TB HDD (RAID 1)

- 3 RabbitMQ servers for messaging, social notifications, and events:
  - 8 core CPUs

- 32GB of RAM

· Miscellaneous servers:
- Jenkins, monitoring, bastion hosts, security scanners
- 8 core CPUs
- 32GB of RAM

Storage appliances:
· iSCSI for VM hosts
· Fiber channel SAN – MySQL databases
- 1 PB total storage; 400 TB available
· NAS – image storage, logs, backups
- 100 TB total storage; 35 TB available

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

Technical Requirements
· Easily create non-production environment 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.

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.

Answer: D

QUESTION 89
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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.

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.

Answer: A

QUESTION 90
Case Study: 5 - Dress4win

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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.

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

Answer: D

QUESTION 91
Case Study: 6 - TerramEarth

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 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. My goals are to build our skills while addressing immediate market needs through incremental innovations.

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 period to 36 months. For Cloud Storage, use gsutil to create a SetStorageClass to NONE action with an Age condition of 36 months.

Answer: C

QUESTION 92
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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.

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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. My goals are to build our skills while addressing immediate market needs through incremental innovations.

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

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

Answer: A

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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 pre-emptible instance with 32 CPUs.

Answer: A
Explanation:
1. BigQuery does not guarantee data consistency for external data sources. Changes to the underlying data while a query is running can result in unexpected behavior.
2. Query performance for external data sources may not be as high as querying data in a native BigQuery table.

QUESTION 94
Case Study: 7 - Mountkirk Games

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.

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.

Answer: AB

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- 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.

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.

Answer: D

QUESTION 96
Case Study: 7 - Mountkirk Games

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
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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 Kubernetes Engine to improve the availability 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.

Answer: BC

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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.

Answer: C

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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.

Answer: D

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Case Study: 7 - Mountkirk Games

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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

Answer: A

QUESTION 100
Your customer support tool logs all email and chat conversations to Cloud Bigtable for retention and analysis. What is the recommended approach for sanitizing this data of personally identifiable information or payment card information before initial storage?

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

Answer: C
Explanation:
https://cloud.google.com/solutions/pci-dss-compliance-ingcp#using_data_loss_prevention_api_to_sanitize_data

QUESTION 101
You are using Cloud Shell and need to install a custom utility for use in a few weeks. Where can you store the file so it is in the default execution path and persists across sessions?

A. ~/bin
B. Cloud Storage
C. /google/scripts
D. /usr/local/bin

Answer: A

QUESTION 102
You want to create a private connection between your instances on Compute Engine and your on- premises data center. You require a connection of at least 20 Gbps. You want to follow Google- recommended practices. How should you set up the connection?

A. Create a VPC and connect it to your on-premises data center using Dedicated Interconnect.
B. Create a VPC and connect it to your on-premises data center using a single Cloud VPN.
C. Create a Cloud Content Delivery Network (Cloud CDN) and connect it to your on-premises data center using Dedicated Interconnect.
D. Create a Cloud Content Delivery Network (Cloud CDN) and connect it to your on-premises datacenter using a single Cloud VPN.

Answer: A
Explanation:
https://cloud.google.com/compute/docs/instances/connecting-advanced

QUESTION 103
You are analyzing and defining business processes to support your startup's trial usage of GCP, and you don't yet know what consumer demand for your product will be. Your manager requires you to minimize GCP service costs and adhere to Google best practices. What should you do?

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

Answer: B

QUESTION 104
You are building a continuous deployment pipeline for a project stored in a Git source repository and want to ensure that code changes can be verified deploying to production. What should you do?

A. Use Spinnaker to deploy builds to production using the red/black deployment strategy so that changes can easily be rolled back.
B. Use Spinnaker to deploy builds to production and run tests on production deployments.
C. Use Jenkins to build the staging branches and the master branch. Build and deploy changes to production for 10% of users before doing a complete rollout.
D. Use Jenkins to monitor tags in the repository. Deploy staging tags to a staging environment for testing.
After testing, tag the repository for production and deploy that to the production environment.

Answer: D
Explanation:
Automation Jenkins can monitor Git repo

QUESTION 105
You have an outage in your Compute Engine managed instance group: all instance keep restarting after 5 seconds. You have a health check configured, but autoscaling is disabled. Your colleague, who is a Linux expert, offered to look into the issue. You need to make sure that he can access the VMs. What should you do?

A. Grant your colleague the IAM role of project Viewer
B. Perform a rolling restart on the instance group
C. Disable the health check for the instance group. Add his SSH key to the project-wide SSH keys
D. Disable autoscaling for the instance group. Add his SSH key to the project-wide SSH Keys

Answer: C

QUESTION 106
Your company is migrating its on-premises data center into the cloud. As part of the migration, you want to integrate Kubernetes Engine for workload orchestration. Parts of your architecture must also be PCI DSS- compliant. Which of the following is most accurate?

A. App Engine is the only compute platform on GCP that is certified for PCI DSS hosting.
B. Kubernetes Engine cannot be used under PCI DSS because it is considered shared hosting.
C. Kubernetes Engine and GCP provide the tools you need to build a PCI DSS-compliant environment.
D. All Google Cloud services are usable because Google Cloud Platform is certified PCI-compliant.

Answer: C

QUESTION 107
Your company has multiple on-premises systems that serve as sources for reporting. The data has not been maintained well and has become degraded over time. You want to use Google-recommended practices to detect anomalies in your company data. What should you do?

A. Upload your files into Cloud Storage. Use Cloud Datalab to explore and clean your data.
B. Upload your files into Cloud Storage. Use Cloud Dataprep to explore and clean your data.
C. Connect Cloud Datalab to your on-premises systems. Use Cloud Datalab to explore and clean your data.
D. Connect Cloud Dataprep to your on-premises systems. Use Cloud Dataprep to explore and clean your data.

Answer: B

QUESTION 108
Google Cloud Platform resources are managed hierarchically using organization, folders, and projects. When Cloud Identity and Access Management (IAM) policies exist at these different levels, what is the effective policy at a particular node of the hierarchy?

A. The effective policy is determined only by the policy set at the node
B. The effective policy is the policy set at the node and restricted by the policies of its ancestors
C. The effective policy is the union of the policy set at the node and policies inherited from its ancestors
D. The effective policy is the intersection of the policy set at the node and policies inherited from its ancestors

Answer: C
Explanation:
https://cloud.google.com/resource-manager/docs/cloud-platform-resource-hierarchy

QUESTION 109
You are migrating your on-premises solution to Google Cloud in several phases. You will use Cloud VPN to maintain a connection between your on-premises systems and Google Cloud until the migration is completed. You want to make sure all your on-premises systems remain reachable during this period. How should you organize your networking in Google Cloud?

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

Answer: C

QUESTION 110
You have found an error in your App Engine application caused by missing Cloud Datastore indexes. You have created a YAML file with the required indexes and want to deploy these new indexes to Cloud Datastore. What should you do?

A. Point gcloud datastore create-indexes to your configuration file
B. Upload the configuration file the App Engine's default Cloud Storage bucket, and have App Engine detect the new indexes
C. In the GCP Console, use Datastore Admin to delete the current indexes and upload the new configuration file
D. Create an HTTP request to the built-in python module to send the index configuration file to your application

Answer: A

QUESTION 111
You have an application that will run on Compute Engine. You need to design an architecture that takes into account a disaster recovery plan that requires your application to fail over to another region in case of a regional outage. What should you do?

A. Deploy the application on two Compute Engine instances in the same project but in a different region.
Use the first instance to serve traffic, and use the HTTP load balancing service to fail over to the standby instance in case of a disaster.
B. Deploy the application on a Compute Engine instance. Use the instance to serve traffic, and use the HTTP load balancing service to fail over to an instance on your premises in case of a disaster.
C. Deploy the application on two Compute Engine instance groups, each in the same project but in a different region. Use the first instance group to serve traffic, and use the HTTP load balancing service to fail over to the standby instance group in case of a disaster.
D. Deploy the application on two Compute Engine instance groups, each in separate project and a different region. Use the first instance group to server traffic, and use the HTTP load balancing service to fail over to the standby instance in case of a disaster.

Answer: C

QUESTION 112
You are deploying an application on App Engine that needs to integrate with an on-premises database. For security purposes, your on-premises database must not be accessible through the public Internet.
What should you do?

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

Answer: D

QUESTION 113
You are working in a highly secured environment where public Internet access from the Compute Engine VMs is not allowed. You do not yet have a VPN connection to access an on-premises file server. You need to install specific software on a Compute Engine instance. How should you install the software?

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

installation files to the VM using gcloud.

D. Upload the required installation files to Cloud Source Repositories and use firewall rules to block all traffic except the IP address range for Cloud Source Repositories. Download the files to the VM using gsutil.

Answer: A

QUESTION 114
Your company is moving 75 TB of data into Google Cloud. You want to use Cloud Storage and follow Google-recommended practices. What should you do?

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

Answer: C
Explanation:
https://cloud.google.com/solutions/transferring-big-data-sets-to-gcp

QUESTION 115
You have an application deployed on Kubernetes Engine using a Deployment named echo-deployment. The deployment is exposed using a Service called echo-service. You need to perform an update to the application with minimal downtime to the application. What should you do?

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

Answer: A
Explanation:
https://cloud.google.com/kubernetes-engine/docs/how-to/updating-apps

QUESTION 116
Your company is using BigQuery as its enterprise data warehouse. Data is distributed over several Google Cloud projects. All queries on BigQuery need to be billed on a single project. You want to make sure that no query costs are incurred on the projects that contain the data. Users should be able to query the datasets, but not edit them.
How should you configure users' access roles?

A. Add all users to a group. Grant the group the role of BigQuery user on the billing project and BigQuery dataViewer on the projects that contain the data.

B. Add all users to a group. Grant the group the roles of BigQuery dataViewer on the billing project and BigQuery user on the projects that contain the data.
C. Add all users to a group. Grant the group the roles of BigQuery jobUser on the billing project and BigQuery dataViewer on the projects that contain the data.
D. Add all users to a group. Grant the group the roles of BigQuery dataViewer on the billing project and BigQuery jobUser on the projects that contain the data.

Answer: C
Explanation:
https://cloud.google.com/bigquery/docs/running-queries
JobUser allow to run query while BigQuery DataViewer only READ ONLY

QUESTION 117
You have developed an application using Cloud ML Engine that recognizes famous paintings from uploaded images. You want to test the application and allow specific people to upload images for the next 24 hours. Not all users have a Google Account. How should you have users upload images?

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

Answer: B
Explanation:
https://cloud.google.com/storage/docs/access-control/signed-urls

QUESTION 118
Your web application must comply with the requirements of the European Union's General Data Protection Regulation (GDPR). You are responsible for the technical architecture of your web application. What should you do?

A. Ensure that your web application only uses native features and services of Google Cloud Platform, because Google already has various certifications and provides "pass-on" compliance when you use native features.
B. Enable the relevant GDPR compliance setting within the GCPConsole for each of the services in use within your application.
C. Ensure that Cloud Security Scanner is part of your test planning strategy in order to pick up any compliance gaps.
D. Define a design for the security of data in your web application that meets GDPR requirements.

Answer: D
Explanation:
https://www.mobiloud.com/blog/gdpr-compliant-mobile-app/

QUESTION 119
You need to set up Microsoft SQL Server on GCP. Management requires that there's no

downtime in case of a data center outage in any of the zones within a GCP region. What should you do?

A. Configure a Cloud SQL instance with high availability enabled.
B. Configure a Cloud Spanner instance with a regional instance configuration.
C. Set up SQL Server on Compute Engine, using Always On Availability Groups using Windows Failover Clustering. Place nodes in different subnets.
D. Set up SQL Server Always On Availability Groups using Windows Failover Clustering. Place nodes in different zones.

Answer: D
Explanation:
https://cloud.google.com/solutions/sql-server-always-on-compute-engine

QUESTION 120
The development team has provided you with a Kubernetes Deployment file. You have no infrastructure yet and need to deploy the application. What should you do?

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

Answer: B
Explanation:
Gcloud to create
Kubectl to do Kubernete

QUESTION 121
You need to evaluate your team readiness for a new GCP project. You must perform the evaluation and create a skills gap plan incorporates the business goal of cost optimization. Your team has deployed two GCP projects successfully to date. What should you do?

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

Answer: A

QUESTION 122
You are designing an application for use only during business hours. For the minimum viable product release, you'd like to use a managed product that automatically "scales to zero" so you don't incur costs when there is no activity.
Which primary compute resource should you choose?

A. Cloud Functions
B. Compute Engine

C. Kubernetes Engine
D. AppEngine flexible environment

Answer: A
Explanation:
Remember that Cloud Functions is serverless and scales from zero to scale and back to zero as the demand changes.

QUESTION 123
You are creating an App Engine application that uses Cloud Datastore as its persistence layer. You need to retrieve several root entities for which you have the identifiers. You want to minimize the overhead in operations performed by Cloud Datastore. What should you do?

A. Create the Key object for each Entity and run a batch get operation
B. Create the Key object for each Entity and run multiple get operations, one operation for each entity
C. Use the identifiers to create a query filter and run a batch query operation
D. Use the identifiers to create a query filter and run multiple query operations, one operation for each entity

Answer: A

QUESTION 124
You need to upload files from your on-premises environment to Cloud Storage. You want the files to be encrypted on Cloud Storage using customer-supplied encryption keys. What should you do?

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

Answer: A

QUESTION 125
You are using a single Cloud SQL instance to serve your application from a specific zone. You want to introduce high availability. What should you do?

A. Create a read replica instance in a different region
B. Create a failover replica instance in a different region
C. Create a read replica instance in the same region, but in a different zone
D. Create a failover replica instance in the same region, but in a different zone

Answer: D
Explanation:
https://cloud.google.com/sql/docs/mysql/configure-ha

QUESTION 126

Your company is running a stateless application on a Compute Engine instance. The application is used heavily during regular business hours and lightly outside of business hours. Users are reporting that the application is slow during peak hours. You need to optimize the application's performance. What should you do?

A. Create a snapshot of the existing disk. Create an instance template from the snapshot. Create an autoscaled managed instance group from the instance template.
B. Create a snapshot of the existing disk. Create a custom image from the snapshot. Create an autoscaled managed instance group from the custom image.
C. Create a custom image from the existing disk. Create an instance template from the custom image.
Create an autoscaled managed instance group from the instance template.
D. Create an instance template from the existing disk. Create a custom image from the instance template.
Create an autoscaled managed instance group from the custom image.

Answer: C

QUESTION 127
Your web application has several VM instances running within a VPC. You want to restrict communications between instances to only the paths and ports you authorize, but you don't want to rely on static IP addresses or subnets because the app can autoscale. How should you restrict communications?

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

Answer: B

QUESTION 128
You are using Cloud SQL as the database backend for a large CRM deployment. You want to scale as usage increases and ensure that you don't run out of storage, maintain 75% CPU usage cores, and keep replication lag below 60 seconds. What are the correct steps to meet your requirements?

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

2. Deploy memcached to reduce CPU load.
3. Create a Stackdriver alert for replication lag, and change the instance type to a 32-core machine type to reduce replication lag.

Answer: A

QUESTION 129
You are tasked with building an online analytical processing (OLAP) marketing analytics and reporting tool. This requires a relational database that can operate on hundreds of terabytes of data. What is the Google- recommended tool for such applications?

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

Answer: D
Explanation:
Because this requires a relational database
https://cloud.google.com/files/BigQueryTechnicalWP.pdf
BigQuery is relational database and suport OLAP
Cloud Spanner OLTP

QUESTION 130
You have deployed an application to Kubernetes Engine, and are using the Cloud SQL proxy container to make the Cloud SQL database available to the services running on Kubernetes. You are notified that the application is reporting database connection issues. Your company policies require a post-mortem. What should you do?

A. Use gcloud sql instances restart.
B. Validate that the Service Account used by the Cloud SQL proxy container still has the Cloud Build Editor role.
C. In the GCP Console, navigate to Stackdriver Logging. Consult logs for Kubernetes Engine and Cloud SQL.
D. In the GCP Console, navigate to Cloud SQL. Restore the latest backup. Use kubectl to restart all pods.

Answer: C

QUESTION 131
Your company pushes batches of sensitive transaction data from its application server VMs to Cloud Pub/ Sub for processing and storage. What is the Google-recommended way for your application to authenticate to the required Google Cloud services?

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

service account the appropriate Cloud Pub/Sub IAM roles.

Answer: A

QUESTION 132
You want to establish a Compute Engine application in a single VPC across two regions. The application must communicate over VPN to an on-premises network. How should you deploy the VPN?

A. Use VPC Network Peering between the VPC and the on-premises network.
B. Expose the VPC to the on-premises network using IAM and VPC Sharing.
C. Create a global Cloud VPN Gateway with VPN tunnels from each region to the on-premises peer gateway.
D. Deploy Cloud VPN Gateway in each region. Ensure that each region has at least one VPN tunnel to the on-premises peer gateway.

Answer: D

QUESTION 133
Your applications will be writing their logs to BigQuery for analysis. Each application should have its own table. Any logs older than 45 days should be removed. You want to optimize storage and follow Google- recommended practices. What should you do?

A. Configure the expiration time for your tables at 45 days
B. Make the tables time-partitioned, and configure the partition expiration at 45 days
C. Rely on BigQuery's default behavior to prune application logs older than 45 days
D. Create a script that uses the BigQuery command line tool (bq) to remove records older than 45 days

Answer: B

QUESTION 134
Your company is migrating its on-premises data center into the cloud. As part of the migration, you want to integrate Kubernetes Engine for workload orchestration. Parts of your architecture must also be PCI DSS- compliant. Which of the following is most accurate?

A. App Engine is the only compute platform on GCP that is certified for PCI DSS hosting.
B. Kubernetes Engine cannot be used under PCI DSS because it is considered shared hosting.
C. Kubernetes Engine and GCP provide the tools you need to build a PCI DSS-compliant environment.
D. All Google Cloud services are usable because Google Cloud Platform is certified PCI-compliant.

Answer: C

QUESTION 135
Your company processes high volumes of IoT data that are time-stamped. The total data volume can be several petabytes. The data needs to be written and changed at a high speed.
You want to use the most performant storage option for your data.
Which product should you use?

A. Cloud Datastore
B. Cloud Storage
C. Cloud Bigtable
D. BigQuery

Answer: C
Explanation:
A) is not correct because Cloud Datastore is not the most performant product for frequent writes or timestamp-based queries.
B) is not correct because Cloud Storage is designed for object storage not for this type of data ingestion and collection.
C) is correct because Cloud Bigtable is the most performant storage option to work with IoT and time series data.
D) is not correct because although it can store the data, BigQuery is very slow at changing data.
Reference:
Cloud Bigtable Schema Design for Time Series Data:
https://cloud.google.com/bigtable/docs/schema-design-time-series

QUESTION 136
You are migrating your on-premises solution to Google Cloud in several phases. You will use Cloud VPN to maintain a connection between your on-premises systems and Google Cloud until the migration is completed. You want to make sure all your on-premises systems remain reachable during this period. How should you organize your networking in Google Cloud?

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

Answer: C

QUESTION 137
Your customer wants to capture multiple GBs of aggregate real-time key performance indicators (KPIs) from their game servers running on Google Cloud Platform and monitor the KPIs with low latency. How should they capture the KPIs?

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

Answer: B

QUESTION 138
You have a Python web application with many dependencies that requires 0.1 CPU cores and 128 MB of memory to operate in production. You want to monitor and maximize machine utilization. You also to reliably deploy new versions of the application. Which set of steps should you take?

A. Perform the following:
1. Create a managed instance group with f1-micro type machines.
2. Use a startup script to clone the repository, check out the production branch, install the dependencies, and start the Python app.
3. Restart the instances to automatically deploy new production releases.

B. Perform the following:
1. Create a managed instance group with n1-standard-1 type machines.
2. Build a Compute Engine image from the production branch that contains all of the dependencies and automatically starts the Python app.
3. Rebuild the Compute Engine image, and update the instance template to deploy new production releases.

C. Perform the following:
1. Create a Kubernetes Engine cluster with n1-standard-1 type machines.
2. Build a Docker image from the production branch with all of the dependencies, and tag it with the version number.
3. Create a Kubernetes Deployment with the imagePullPolicy set to "IfNotPresent" in the staging namespace, and then promote it to the production namespace after testing.

D. Perform the following:
1. Create a Kubernetes Engine cluster with n1-standard-4 type machines.
2. Build a Docker image from the master branch will all of the dependencies, and tag it with "latest".
3. Create a Kubernetes Deployment in the default namespace with the imagePullPolicy set to "Always". Restart the pods to automatically deploy new production releases.

Answer: C

QUESTION 139
Your company wants to start using Google Cloud resources but wants to retain their on-premises Active Directory domain controller for identity management. What should you do?

A. Use the Admin Directory API to authenticate against the Active Directory domain controller.
B. Use Google Cloud Directory Sync to synchronize Active Directory usernames with cloud identities and configure SAML SSO.
C. Use Cloud Identity-Aware Proxy configured to use the on-premises Active Directory domain controller as an identity provider.
D. Use Compute Engine to create an Active Directory (AD) domain controller that is a replica of the on- premises AD domain controller using Google Cloud Directory Sync.

Answer: B
Explanation:
https://cloud.google.com/blog/products/identity-security/using-your-existing-identitymanagement-system-with-google-cloud-platform

QUESTION 140
You are running a cluster on Kubernetes Engine to serve a web application. Users are reporting

that a specific part of the application is not responding anymore. You notice that all pods of your deployment keep restarting after 2 seconds. The application writes logs to standard output. You want to inspect the logs to find the cause of the issue. Which approach can you take?

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

Answer: B

QUESTION 141
You need to develop procedures to verify resilience of disaster recovery for remote recovery using GCP. Your production environment is hosted on-premises. You need to establish a secure, redundant connection between your on premises network and the GCP network.

What should you do?

A. Verify that Dedicated Interconnect can replicate files to GCP. Verify that direct peering can establish a secure connection between your networks if Dedicated Interconnect fails.
B. Verify that Dedicated Interconnect can replicate files to GCP. Verify that Cloud VPN can establish a secure connection between your networks if Dedicated Interconnect fails.
C. Verify that the Transfer Appliance can replicate files to GCP. Verify that direct peering can establish a secure connection between your networks if the Transfer Appliance fails.
D. Verify that the Transfer Appliance can replicate files to GCP. Verify that Cloud VPN can establish a secure connection between your networks if the Transfer Appliance fails.

Answer: B

QUESTION 142
Your company operates nationally and plans to use GCP for multiple batch workloads, including some that are not time-critical. You also need to use GCP services that are HIPAA-certified and manage service costs.

How should you design to meet Google best practices?

A. Provisioning preemptible VMs to reduce cost. Discontinue use of all GCP services and APIs that are not HIPAA-compliant.
B. Provisioning preemptible VMs to reduce cost. Disable and then discontinue use of all GCP and APIs that are not HIPAA-compliant.
C. Provision standard VMs in the same region to reduce cost. Discontinue use of all GCP services and APIs that are not HIPAA-compliant.
D. Provision standard VMs to the same region to reduce cost. Disable and then discontinue use of all GCP services and APIs that are not HIPAA-compliant.

Answer: B

QUESTION 143
Your customer wants to do resilience testing of their authentication layer. This consists of a regional managed instance group serving a public REST API that reads from and writes to a Cloud SQL instance.

What should you do?

A. Engage with a security company to run web scrapes that look your users' authentication data om malicious websites and notify you if any if found.
B. Deploy intrusion detection software to your virtual machines to detect and log unauthorized access.
C. Schedule a disaster simulation exercise during which you can shut off all VMs in a zone to see how your application behaves.
D. Configure a red replica for your Cloud SQL instance in a different zone than the master, and then manually trigger a failover while monitoring KPIs for our REST API.

Answer: B
Explanation:
Resilience testing is a crucial step in ensuring applications perform well in real-life conditions. It is part of the non-functional sector of software testing that also .

QUESTION 144
Your BigQuery project has several users. For audit purposes, you need to see how many queries each user ran in the last month.

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

Answer: D
Explanation:
https://cloud.google.com/bigquery/docs/access-control

QUESTION 145
You want to automate the creation of a managed instance group and a startup script to install the OS package dependencies. You want to minimize the startup time for VMs in the instance group.

What should you do?

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

Answer: B

QUESTION 146
Your company captures all web traffic data in Google Analytics 260 and stores it in BigQuery. Each country has its own dataset. Each dataset has multiple tables. You want analysts from each country to be able to see and query only the data for their respective countries.

How should you configure the access rights?

A. Create a group per country. Add analysts to their respective country-groups. Create a single group `all_analysts', and add all country-groups as members. Grant the `all-analysis' group the IAM role of BigQuery jobUser. Share the appropriate dataset with view access with each respective analyst country-group.
B. Create a group per country. Add analysts to their respective country-groups. Create a single group `all_analysts', and add all country-groups as members. Grant the `all-analysis' group the IAM role of BigQuery jobUser. Share the appropriate tables with view access with each respective analyst country- group.
C. Create a group per country. Add analysts to their respective country-groups. Create a single group `all_analysts', and add all country-groups as members. Grant the `all-analysis' group the IAM role of BigQuery dataViewer. Share the appropriate dataset with view access with each respective analyst country-group.
D. Create a group per country. Add analysts to their respective country-groups. Create a single group `all_analysts', and add all country-groups as members. Grant the `all-analysis' group the IAM role of BigQuery dataViewer. Share the appropriate table with view access with each respective analyst country-group.

Answer: A

QUESTION 147
You have been engaged by your client to lead the migration of their application infrastructure to GCP. One of their current problems is that the on-premises high performance SAN is requiring frequent and expensive upgrades to keep up with the variety of workloads that are identified as follows: 20TB of log archives retained for legal reasons; 500 GB of VM boot/data volumes and templates; 500 GB of image thumbnails; 200 GB of customer session state data that allows customers to restart sessions even if off- line for several days.

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

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

Answer: D

QUESTION 148
Your web application uses Google Kubernetes Engine to manage several workloads. One workload requires a consistent set of hostnames even after pod scaling and relaunches.

Which feature of Kubernetes should you use to accomplish this?

A. StatefulSets
B. Role-based access control
C. Container environment variables
D. Persistent Volumes

Answer: A

QUESTION 149
You are using Cloud CDN to deliver static HTTP(S) website content hosted on a Compute Engine instance group. You want to improve the cache hit ratio.

What should you do?

A. Customize the cache keys to omit the protocol from the key.
B. Shorten the expiration time of the cached objects.
C. Make sure the HTTP(S) header "Cache-Region" points to the closest region of your users.
D. Replicate the static content in a Cloud Storage bucket. Point CloudCDN toward a load balancer on that bucket.

Answer: A
Explanation:
https://cloud.google.com/cdn/docs/best-practices#using_custom_cache_keys_to_improve_cache_hit_ratio

QUESTION 150
Your architecture calls for the centralized collection of all admin activity and VM system logs within your project.

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

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

Answer: B
Explanation:
https://cloud.google.com/logging/docs/agent/

QUESTION 151
You have an App Engine application that needs to be updated. You want to test the update with

production traffic before replacing the current application version.

What should you do?

A. Deploy the update using the Instance Group Updater to create a partial rollout, which allows for canary testing.
B. Deploy the update as a new version in the App Engine application, and split traffic between the new and current versions.
C. Deploy the update in a new VPC, and use Google's global HTTP load balancing to split traffic between the update and current applications.
D. Deploy the update as a new App Engine application, and use Google's global HTTP load balancing to split traffic between the new and current applications.

Answer: B

QUESTION 152
All compute Engine instances in your VPC should be able to connect to an Active Directory server on specific ports. Any other traffic emerging from your instances is not allowed. You want to enforce this using VPC firewall rules.
How should you configure the firewall rules?

A. Create an egress rule with priority 1000 to deny all traffic for all instances. Create another egress rule with priority 100 to allow the Active Directory traffic for all instances.
B. Create an egress rule with priority 100 to deny all traffic for all instances. Create another egress rule with priority 1000 to allow the Active Directory traffic for all instances.
C. Create an egress rule with priority 1000 to allow the Active Directory traffic. Rely on the implied deny egress rule with priority 100 to block all traffic for all instances.
D. Create an egress rule with priority 100 to allow the Active Directory traffic. Rely on the implied deny egress rule with priority 1000 to block all traffic for all instances.

Answer: A

QUESTION 153
Your customer runs a web service used by e-commerce sites to offer product recommendations to users. the company has begun experimenting with a machine learning model on Google Cloud Platform to improve the quality of results.

What should the customer do to improve their model's results over time?

A. Export Cloud Machine Learning Engine performance metrics from Stackdriver to BigQuery, to be used to analyze the efficiency of the model.
B. Build a roadmap to move the machine learning model training from Cloud GPUs to Cloud TPUs, which offer better results.
C. Monitor Compute Engine announcements for availability of newer CPU architectures, and deploy the model to them as soon as they are available for additional performance.
D. Save a history of recommendations and results of the recommendations in BigQuery, to be used as training data.

Answer: D
Explanation:
BigQuery need data to be applied in AI.

QUESTION 154
A development team at your company has created a dockerized HTTPS web application. You need to deploy the application on Google Kubernetes Engine (GKE) and make sure that the application scales automatically.

How should you deploy to GKE?

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

Answer: A
Explanation:
https://cloud.google.com/kubernetes-engine/docs/how-to/cluster-autoscaler

QUESTION 155
You need to design a solution for global load balancing based on the URL path being requested. You need to ensure operations reliability and end-to-end in-transit encryption based on Google best practices.

What should you do?

A. Create a cross-region load balancer with URL Maps.
B. Create an HTTPS load balancer with URL maps.
C. Create appropriate instance groups and instances. Configure SSL proxy load balancing.
D. Create a global forwarding rule. Configure SSL proxy balancing.

Answer: B
Explanation:
https://cloud.google.com/load-balancing/docs/https/url-map

QUESTION 156
You have an application that makes HTTP requests to Cloud Storage. Occasionally the requests fail with HTTP status codes of 5xx and 429.

How should you handle these types of errors?

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

Answer: B

Explanation:
https://cloud.google.com/storage/docs/json_api/v1/status-codes

QUESTION 157
You need to develop procedures to test a disaster plan for a mission-critical application. You want to use Google-recommended practices and native capabilities within GCP.

What should you do?

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

Answer: B

QUESTION 158
Your company creates rendering software which users can download from the company website. Your company has customers all over the world. You want to minimize latency for all your customers. You want to follow Google-recommended practices.

How should you store the files?

A. Save the files in a Multi-Regional Cloud Storage bucket.
B. Save the files in a Regional Cloud Storage bucket, one bucket per zone of the region.
C. Save the files in multiple Regional Cloud Storage buckets, one bucket per zone per region.
D. Save the files in multiple Multi-Regional Cloud Storage buckets, one bucket per multi-region.

Answer: D

QUESTION 159
Your company acquired a healthcare startup and must retain its customers' medical information for up to 4 more years, depending on when it was created. Your corporate policy is to securely retain this data, and then delete it as soon as regulations allow.

Which approach should you take?

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

Answer: C

QUESTION 160
You are deploying a PHP App Engine Standard service with SQL as the backend. You want to minimize the number of queries to the database.

What should you do?

A. Set the memcache service level to dedicated. Create a key from the hash of the query, and return database values from memcache before issuing a query to Cloud SQL.
B. Set the memcache service level to dedicated. Create a cron task that runs every minute to populate the cache with keys containing query results.
C. Set the memcache service level to shared. Create a cron task that runs every minute to save all expected queries to a key called "cached-queries".
D. Set the memcache service level to shared. Create a key called "cached-queries", and return database values from the key before using a query to Cloud SQL.

Answer: A

QUESTION 161
You need to ensure reliability for your application and operations by supporting reliable task a scheduling for compute on GCP. Leveraging Google best practices, what should you do?

A. Using the Cron service provided by App Engine, publishing messages directly to a message-processing utility service running on Compute Engine instances.
B. Using the Cron service provided by App Engine, publish messages to a Cloud Pub/Sub topic. Subscribe to that topic using a message-processing utility service running on Compute Engine instances.
C. Using the Cron service provided by Google Kubernetes Engine (GKE), publish messages directly to a message-processing utility service running on Compute Engine instances.
D. Using the Cron service provided by GKE, publish messages to a Cloud Pub/Sub topic. Subscribe to that topic using a message-processing utility service running on Compute Engine instances.

Answer: B

QUESTION 162
Your company is building a new architecture to support its data-centric business focus. You are responsible for setting up the network. Your company's mobile and web-facing applications will be deployed on-premises, and all data analysis will be conducted in GCP. The plan is to process and load 7 years of archived .csv files totaling 900 TB of data and then continue loading 10 TB of data daily. You currently have an existing 100-MB internet connection.

What actions will meet your company's needs?

A. Compress and upload both achieved files and files uploaded daily using the qsutil “m option.
B. Lease a Transfer Appliance, upload archived files to it, and send it, and send it to Google to transfer archived data to Cloud Storage. Establish a connection with Google using a Dedicated Interconnect or Direct Peering connection and use it to upload files daily.
C. Lease a Transfer Appliance, upload archived files to it, and send it, and send it to Google to transfer archived data to Cloud Storage. Establish one Cloud VPN Tunnel to VPC networks over the public internet, and compares and upload files daily using the gsutil –m option.
D. Lease a Transfer Appliance, upload archived files to it, and send it to Google to transfer archived data to Cloud Storage. Establish a Cloud VPN Tunnel to VPC networks over the public internet,

and compress and upload files daily.

Answer: B

QUESTION 163
You are developing a globally scaled frontend for a legacy streaming backend data API. This API expects events in strict chronological order with no repeat data for proper processing.

Which products should you deploy to ensure guaranteed-once FIFO (first-in, first-out) delivery of data?

A. Cloud Pub/Sub alone
B. Cloud Pub/Sub to Cloud DataFlow
C. Cloud Pub/Sub to Stackdriver
D. Cloud Pub/Sub to Cloud SQL

Answer: D
Explanation:
https://cloud.google.com/pubsub/docs/ordering

QUESTION 164
A recent audit revealed that a new network was created in your GCP project. In this network, a GCE instance has an SSH port open to the world. You want to discover this network's origin.

What should you do?

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

Answer: C
Explanation:
Incorrect Answers:
A: To use the Stackdriver alerting console we must first set up alerting policies.
B: Data access logs only contain read-only operations.
Audit logs help you determine who did what, where, and when.
Cloud Audit Logging returns two types of logs:
Admin activity logs
Data access logs: Contains log entries for operations that perform read-only operations do not modify any data, such as get, list, and aggregated list methods.

QUESTION 165
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

Answer: A
Explanation:
On Linux instances, connect to your instance and manually resize your partitions and file systems to use the additional disk space that you added.
Extend the file system on the disk or the partition to use the added space. If you grew a partition on your disk, specify the partition. If your disk does not have a partition table, specify only the disk ID.
sudo resize2fs /dev/[DISK_ID][PARTITION_NUMBER]
where [DISK_ID] is the device name and [PARTITION_NUMBER] is the partition number for the device where you are resizing the file system.
References: https://cloud.google.com/compute/docs/disks/add-persistent-disk

QUESTION 166
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 user's usage of the app, and deploy enough resources to handle 200% of expected load

Answer: B

QUESTION 167
Case Study: 7 - Mountkirk Games

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.

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.

Answer: C

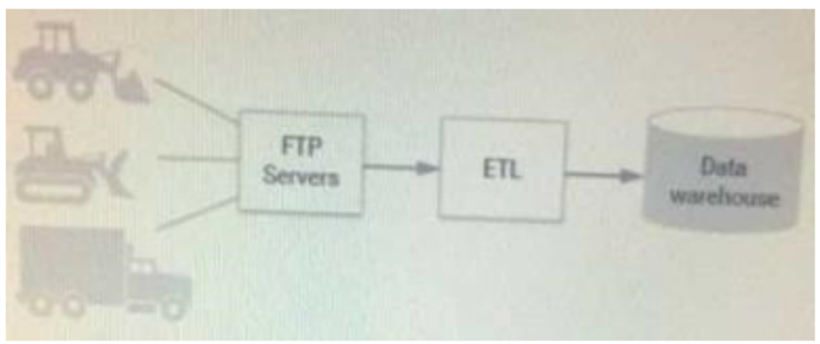
QUESTION 168
Case Study: 2 - TerramEarth Case Study

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 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 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.

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.

Answer: AC

QUESTION 169
Case Study: 6 - TerramEarth

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 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. My goals are to build our skills while addressing immediate market needs through incremental innovations.

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 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.

Answer: D

QUESTION 170
Case Study: 6 - TerramEarth

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

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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 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. My goals are to build our skills while addressing immediate market needs through incremental innovations.

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 MultiRegional 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 prtitioned Hive tables. Use Pig scripts to analyze data.

Answer: A

QUESTION 171
Case Study: 6 - TerramEarth

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
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- 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 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. My goals are to build our skills while addressing immediate market needs through incremental innovations.

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

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

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

Answer: B

QUESTION 172

Case Study: 4 - Dress4Win

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:
- 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.

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.

Answer: B

QUESTION 173
Case Study: 4 - Dress4Win

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:
- 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.

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 Bigtabte 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.

Answer: A
Explanation:
https://cloud.google.com/storage/docs/storage-classes

QUESTION 174
Case Study: 4 - Dress4Win

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:
- 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.

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, Dresss4win 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.

Answer: A

QUESTION 175
Case Study: 5 - Dress4win

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. The 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 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
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Compute:
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  - Tomcat - Java
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- 20 Apache Hadoop/Spark servers:
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  - Real-time trending calculations
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  - Jenkins, monitoring, bastion hosts, security scanners
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Storage appliances:
- iSCSI for VM hosts
- Fiber channel SAN – MySQL databases
  - 1 PB total storage; 400 TB available
- NAS – image storage, logs, backups
  - 100 TB total storage; 35 TB available

Business Requirements
- Build a reliable and reproducible environment with scaled parity of production.
- Improve security by defining and adhering to a set of security and Identity and Access Management (IAM) best practices for cloud.

- Improve business agility and speed of innovation through rapid provisioning of new resources.
- Analyze and optimize architecture for performance in the cloud.

Technical Requirements

- Easily create non-production environment 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.

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.

Answer: D

QUESTION 176
Case Study: 5 - Dress4win

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. The 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 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
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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.

Answer: C

QUESTION 177
Case Study: 5 - Dress4win

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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.

Answer: D

Question 178

You have an application running on Compute Engine that uses BigQuery to generate some results that are stored in Cloud Storage. You want to ensure that none of the application instances have external IP addresses.

Which two methods can you use to accomplish this? (Choose two.)

A. Enable Private Google Access on all the subnets.

B. Enable Private Google Access on the VPC.

C. Enable Private Services Access on the VPC.

D. Create network peering between your VPC and BigQuery.

E. Create a Cloud NAT, and route the application traffic via NAT gateway.

Answer: AE

QUESTION 179

Which of the following IAM roles does your Compute Engine account require to be able to run pipeline jobs?

A. dataow.worker

B. dataow.compute

C. dataow.developer

D. dataow.viewer

Answer:A

QUESTION 180

What are the minimum permissions needed for a service account used with Google Dataproc?

A. Execute to Google Cloud Storage; write to Google Cloud Logging

B. Write to Google Cloud Storage; read to Google Cloud Logging

C. Execute to Google Cloud Storage; execute to Google Cloud Logging

D. Read and write to Google Cloud Storage; write to Google Cloud Logging

Answer:D

Reference: https://cloud.google.com/dataproc/docs/concepts/service-accounts#important_notes

Question 181

You have ordered Dedicated Interconnect in the GCP Console and need to give the Letter of Authorization/Connecting Facility Assignment (LOA-CFA) to your cross-connect provider to complete the physical connection.

Which two actions can accomplish this? (Choose two.)

A. Open a Cloud Support ticket under the Cloud Interconnect category.

B. Download the LOA-CFA from the Hybrid Connectivity section of the GCP Console.

C. Run gcloud compute interconnects describe <interconnect>.

D. Check the email for the account of the NOC contact that you specified during the ordering process.

E. Contact your cross-connect provider and inform them that Google automatically sent the LOA/CFA to them via email, and to complete the connection.

Answer: BD

QUESTION 182

An external customer provides you with a daily dump of data from their database. The data flows into Google Cloud Storage GCS as comma-separated values (CSV) files. You want to analyze this data in Google BigQuery, but the data could have rows that are formatted incorrectly or corrupted. How should you build this pipeline?

A. Use federated data sources, and check data in the SQL query.

B. Enable BigQuery monitoring in Google Stackdriver and create an alert.

C. Import the data into BigQuery using the gcloud CLI and set max_bad_records to 0.

D. Run a Google Cloud Dataflow batch pipeline to import the data into BigQuery, and push errors to another dead-letter table for analysis.

Answer:D