Professional Cloud Architect

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Google confidential & proprietary

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Thank you!

Session Logistics

- When you have a question, please:
  - Click the Raise hand button in Google Meet.
  - Or add your question to the Q&A section of Google Meet.
  - Please note that answers may be deferred until the end of the session.

- These slides are available in the Student Lecture section of your Qwiklabs classroom.

- The session is **not recorded.**

- Google Meet does not have persistent chat.
  - If you get disconnected, you will lose the chat history.
  - Please copy any important URLs to a local text file as they appear in the chat.

Google Cloud

Our agenda

Google Cloud

Our agenda

Google Cloud

Program overview
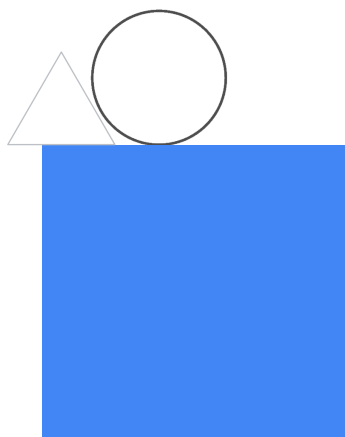
Exam Readiness Workshop

A Partner Certification Academy offering

What is an Exam Readiness Workshop?

This workshop helps learners assess their readiness for the exam, and identify areas where they need more preparation.

This workshop:
- Guide participants to tailored resources for further study based on their unique learning needs
- Explores key topics from the certification exam guide through an interactive question-and-answer format
  - Links are provided with each question, directing learners to detailed answers for deeper understanding and extended learning

Google Cloud

Experience level assumptions

- You have been preparing for the Professional Cloud Architect certification exam and would like to check your knowledge OR
- You have passed the certification exam in a prior year OR
- You have been working as a Google Cloud Architect for at least 1 year and have never taken the exam

This program's review* assumes familiarity with the topics , e.g., IAM

Recommended experience: 3+ years of industry experience including 1+ years designing and managing solutions using Google Cloud

https://cloud.google.com/learn/certification/cloud-architect

*For knowledge validation only. They do not reflect the difficulty or content of the actual certification exam or cover all possible topics, scope or depth of the exam.
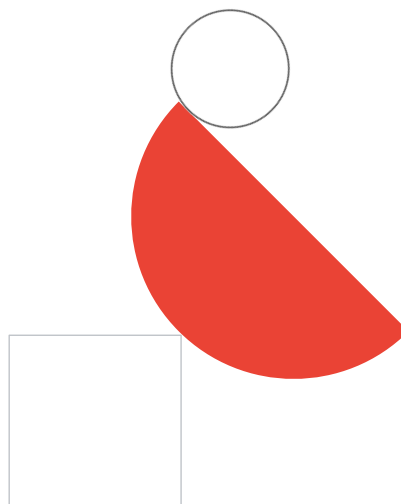
Google Cloud

Exam Information

Professional Cloud Architect

The Google Cloud Certified

Professional Cloud Architect exam assesses your ability to:

- ✓ Design and plan a cloud solution architecture
- ✓ Manage and provision the cloud solution infrastructure
- ✓ Design for security and compliance
- ✓ Analyze and optimize technical and business processes
- ✓ Manage implementations of cloud architecture
- ✓ Ensure solution and operations reliability

For more information:

https://cloud.google.com/learn/certification/cloud-architect

Google Cloud

Exam Guide

Professional Cloud Architect

Professional Cloud Architects enable organizations to leverage Google Cloud technologies. With a thorough understanding of cloud architecture and Google Cloud, they design, develop, and manage robust, secure, scalable, highly available, and dynamic solutions to drive business objectives.

The Professional Cloud Architect certification exam assesses your ability to:

- ✓ Design and plan a cloud solution architecture
- ✓ Design for security and compliance
- ✓ Manage implementations of cloud architecture
- ✓ Manage and provision the cloud solution infrastructure
- ✓ Analyze and optimize technical and business processes
- ✓ Ensure solution and operations reliability

Quick links

Train for the exam

Review sample questions

Review exam preparation guide

Community: Learning & Certification Hub

Exam guide

Partner training for the exam

Professional Cloud Architect

Certification exam guide

A Google Cloud Certified Professional Cloud Architect enables organizations to leverage Google Cloud technologies. Through an understanding of cloud architecture and Google technology, this individual designs, develops, and manages robust, secure, scalable, highly available, and dynamic solutions to drive business objectives. The Cloud Architect should be proficient in all aspects of enterprise cloud strategy, solution design, and architectural best practices. The Cloud Architect should also be experienced in software development methodologies and approaches including multi-tiered distributed applications which span multicloud or hybrid environments.

Case studies

During the exam for the Cloud Architect Certification, some of the questions may refer you to a case study that describes a fictitious business and solution concept. These case studies are intended to provide additional context to help you choose your answers. Review the case studies that may be used in the exam.

EHR Healthcare

Helicopter Racing League

Mountkirk Games

TerramEarth

[Register now]

https://cloud.google.com/learn/certification/guides/professional-cloud-architect

Google Cloud

Where can I register for my Google Cloud certification Exam?

All the official Google Cloud certification exams are handled by an external proctor company called Kryterion Webassessor

01 **Use this unique website to register for all Google Cloud certifications exams**
   a) If you don't have an account, you'll need to create a new account
   b) If you have an account but need to update your contact details, please be sure to update in CertMetrics and Webassessor.

02 Once logged in, click "register for an exam" and select the name of the exam

03 Select the exam delivery format you prefer
   a) **Onsite Proctored** exams are available certain cities at authorized test centers. Please read the recommendations and Onsite Testing Center Exam Instructions for important information.
   b) **Remote Proctored** from home or office. **Be sure to review** the testing requirements and the proctoring process here.

04 Select the exam date and time. If choosing Onsite Proctored, indicate the testing center location.

05 Exam voucher codes are applied at checkout as a "Coupon/Voucher Code"

06 "Checkout" and then "Print" to download a confirmation with details

> Step By Step Instructional video

> kryterion support

Google Cloud

- Link to register for exam: https://webassessor.com/googlecloud

- Link to online video Google about remote exams: https://youtu.be/8bc3jd9Z5Rw

- Link to Kryterion online testing requirements "what you need to know": https://kryterion.force.com/support/s/article/Online-Testing-Requirements?language=en_US#:~:text=Kryterion%20highly%20recommends%20disabling%20all,%2C%20Skype%2C%20Photobooth%20and%20TeamViewer

- Link to Kryterion video about verifying your ID via webcam: https://youtu.be/6QR9xpBZJzY

- Link to Kryterion video "Guidelines for Online Proctored Exams": https://youtu.be/iNWl8d-X8lg

- Link to Kryterion video "Webcam Room Check": https://youtu.be/5QSKbcIJHzg

- Link to Kryterion's list of "Online proctored exams and behaviors to consider": https://kryterion.force.com/support/s/article/Online-Proctored-Exams-and-Behaviors-to-Consider?language=en_US

Exam tips & important details

#1 tip for onsite proctored exams: Register for your exam as far in advance as possible.

Tips for exam registration

- Ensure registration details exactly match your government ID. If it does not match exactly, you will not be able to test and may incur additional fees to reschedule if the mismatch is discovered on your test day.

- **If selecting remote proctored exams, be sure to review the testing requirements and the proctoring process here.**

- Register for your exam as far in advance as possible. Appointments are set up for every 15 minutes around the clock. Top of the hour appointments fill up first. Consider scheduling on the quarter hour.

- Schedule early in the month. Appointments at the end of the month are in high demand. Earlier in the month provides the best chance at your first-choice time slot.

- If you need to reschedule, do so as early as possible for the most options and to avoid fees.
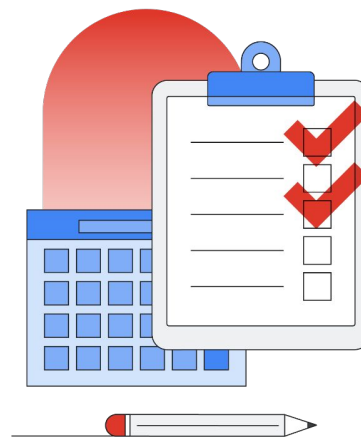
Google Cloud

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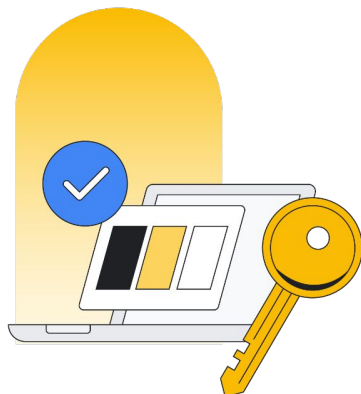
Have your your government ID ready

Tips for remote proctored exam

- **Confirm you have sufficient administrative rights on your device to download all required software.** Before the exam, you will need to <u>log in to your account</u> and install the new, secure browser.

- You'll need reliable/stable Internet connection, a working camera and microphone, and cleared desk surfaces.

- Be familiar with the steps to <u>launch the exam</u> on exam day. There may delay for the button to launch the exam to appear and/or for the proctor to start the exam.

- Watch a <u>video</u> for important details including 1) do not read the question out loud, or even whisper loudly, 2) do not look away from the screen too often or for too long, 3) do not leave your desk or move away from the camera.

- **If you face issues while taking the exam:** Contact webassessor support immediately, best via Live Chat. If Live Chat is not available, submit a request on the <u>Kryterion support site</u> and select "Online Exam Technical" for the case type.

Google Cloud

Kryterion Webassessor
Exam Rescheduling

- You can schedule a **new date and time** by logging into the Webassessor account and selecting "My Assessments", "Scheduled Exams" and then "Reschedule/Cancel".

- For **onsite exams** scheduled at a testing center, a late rescheduling or cancellation fee is applied if you reschedule/cancel the exam **within 72 hours** of start time.

- For **online exams**, a late rescheduling or cancellation fee is applied if you reschedule/cancel your exam **within 24 hours** of the scheduled start time (original Voucher can be reused).
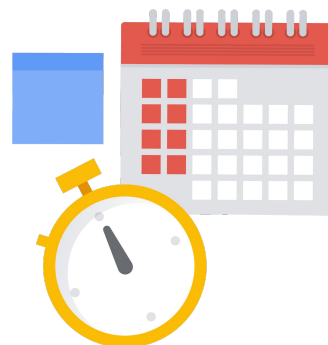
Google Cloud
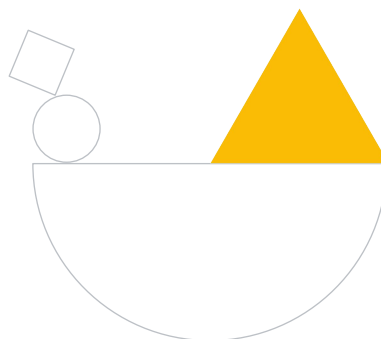
Case Studies

Professional Cloud Architect exam - case studies

- There are 4 case studies per the exam guide
  - EHR Healthcare
  - Helicopter Racing League
  - Mountkirk Games
  - TerramEarth
- Review each prior to the exam
  - Think about which Google Cloud services could be used to meet the requirements
- During the exam there will be an option to view the case studies again
- Case study questions make up 20-30% of the total questions (60 maximum)
  - ~18 questions on the exam (max) will be case study focused

Professional Cloud Architect

Certification exam guide

A Google Cloud Certified Professional Cloud Architect enables organizations to leverage Google Clo... architecture and Goog... manages robust, secu... drive business objecti... aspects of enterprise ... practices. The Cloud A... development methodo... distributed application...

Exam format: 50-60 multiple choice and multiple select questions

Case studies: Each exam includes 2 case studies that describe fictitious business and solution concepts. Case study questions make up 20-30% of the exam and assess your ability to apply your knowledge to a realistic business situation. You can view the case studies on a split screen during the exam. See the Exam Guide for the 4 available case studies.

Case studies

During the exam for th... may refer you to a cas... concept. These case s... help you choose your ... the exam.

EHR Healthcare

Helicopter Racing League

Mountkirk Games

TerramEarth

Links to case studies are in the Exam Guide

Google Cloud

Exam Preparation Resources

Google Cloud

Partner Certification Academy Programs

https://rsvp.withgoogle.com/events/partner-learning/google-cloud-certifications#content
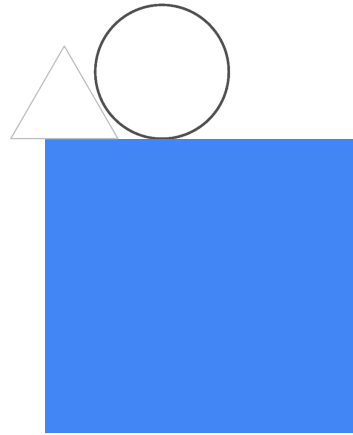
Google Cloud Certifications

Learning Options

Demonstrate your expertise and validate your ability to transform businesses with Google Cloud technology.

We provide multiple study programs to help you get certified, click on the icons below to learn more and get started on your certification journey.
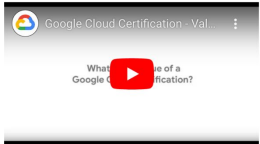
Partner Certification Academy
Study on demand + Attend live classes

Partner Certification Kickstart
Study on demand - structured

Certification Learning Path
Study on demand - at your own pace

Google Cloud

https://rsvp.withgoogle.com/events/partner-learning/google-cloud-certifications

Exam Preparation: On-demand Courses (Optional)

- Google's partners receive free access to [Google Cloud Skills Boost for Partners](#)
  - Contains on-demand course content
  - Hands-on labs
- [Cloud Architect Learning Path](#)
  - A combination of courses and quests to help prepare for the exam

Your attendance to this ERW may have been from a variety of programs and learning modalities. The learning path above is for reference only.

Google Cloud

Google Cloud Skills Boost for Partners: https://partner.cloudskillsboost.google/
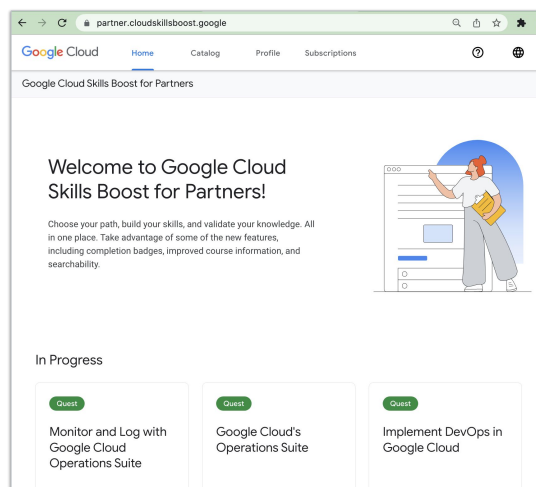
Creating an account in Google Cloud Skills Boost
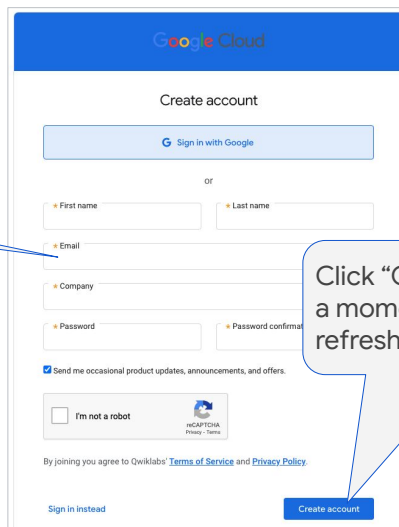
partner.cloudskillsboost.com

Click "Join" to create a new account
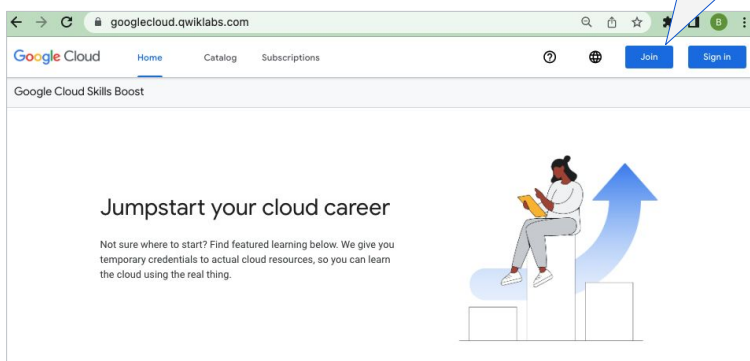
Google Cloud

Account creation

Important: Enter your work email address

Click "Create account". Wait a moment and the screen will refresh.

Accessing PDF copies of workshop slide decks

Click the purple box

Shown two tabs:
● Labs
● Lecture Notes

Google Cloud

Downloading the lecture notes

Select the Lecture Notes tab

Select a Student Guide Book
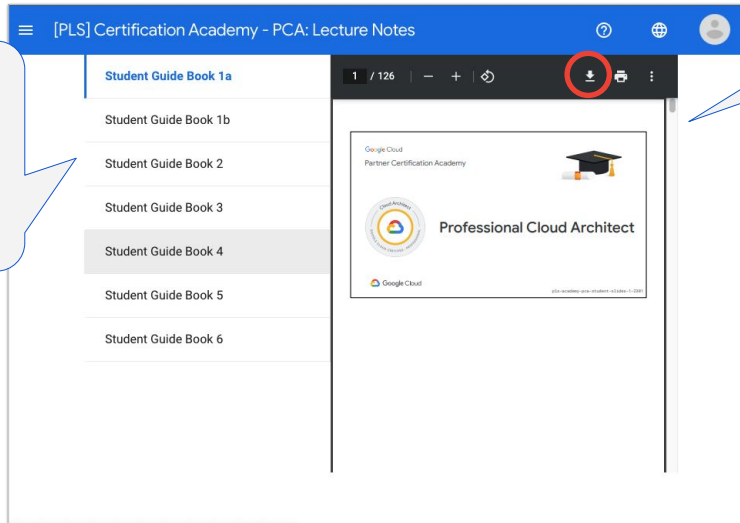
Click the download icon to download the PDF

[PLS] Certification Academy - PCA: Lecture Notes

Student Guide Book 1a

Student Guide Book 1b

Student Guide Book 2

Student Guide Book 3

Student Guide Book 4

Student Guide Book 5

Student Guide Book 6

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Google Cloud
Partner Certification Academy

Professional Cloud Architect

Google Cloud

Google Cloud

Program issues or concerns?

- **General questions** about training, registration, certification tracks or exams or **access issues** with training platforms (e.g. Partner Skills Boost), or quests/labs (e.g., locked out)
    - cloud-partner-training@google.com
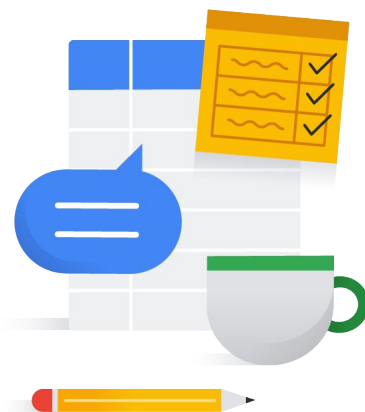
Google Cloud

Technical Review:

IAM and Resource Hierarchy

Test Your Knowledge

Your company has an application running on Compute Engine. You need to grant the application access to several Google Cloud services using the most secure method available. What should you do?

A. Attach the default Compute Engine service account to the Compute Engine instance, then grant it predefined or custom IAM roles which provides access to the required services.

B. Create a service account, assign it the basic IAM role of Editor, and attach this service account to the Instance.

C. Attach the default Compute Engine service account to the instance, and use access scopes to grant access to the Google Cloud services.

D. Create a service account, and grant it predefined or custom IAM roles which provides access to the required services. Then attach the service account to the instance.

Google Cloud

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Best practices for using service accounts

Google Cloud

Test Your Knowledge

Your client created an IAM resource hierarchy with Google Cloud when the company was a startup. Your client has grown and now has multiple departments and teams. You want to recommend a resource hierarchy that follows Google-recommended practices. What should you do?

A. Keep all resources in one project, and use a flat resource hierarchy to reduce complexity and simplify management.

B. Use a single organization node containing folders that represent the departments/teams. Within the folders, create projects with established trust boundaries.

C. Keep all resources in one project, but change the resource hierarchy to reflect company organization.

D. Use multiple projects with established trust boundaries. Change the resource hierarchy so that all projects are under multiple organization nodes, each one reflecting a department/team.

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Resource hierarchy

Test Your Knowledge

Your company's social media app must run in a separate project from its APIs and web store. You want to use IAM to ensure a secure environment. How should you set up IAM?

A. Use separate service accounts for each component (social media app, APIs, and web store) with basic roles to grant access.

B. Use one service account for all components (social media app, APIs, and web store) with basic roles to grant access.

C. Use separate service accounts for each component (social media app, APIs, and web store) with predefined or custom roles to grant access.

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Best practices for using service accounts

Google Cloud

Test Your Knowledge

Your company wants to use IAM to allow employees to have access to Google Cloud resources and services based on their job roles. Several employees are project managers and want to have some level of access to see what has been deployed. The security team wants to ensure that securing the environment and managing resources is simple so that it will scale. What approach should you use?

A. Grant access by assigning custom roles to groups. Assign users to groups based on job role. Give access as close to the resource as possible.

B. Grant access by assigning predefined roles to groups. Assign users to groups based on job role. Give access as close to the resource as possible.

C. Give access directly to each individual for more granular control. Give access as close to the top of the the hierarchy as possible.

D. Grant access by assigning predefined roles to a group. Assign all users to this single group. Give access as close to the top of the the hierarchy as possible.

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When to use custom roles

Google Cloud

Test Your Knowledge

Cymbal Direct is working on a social media integration service in Google Cloud. Mahesh is a non-technical manager who wants to ensure that the project doesn't exceed the budget and responds quickly to unexpected cost increases. You need to set up access and billing for the project. What should you do?

A. Assign the predefined Billing Account Administrator role to Mahesh. Create a project budget. Configure billing alerts to be sent to the Project Owner. Use resource quotas to cap how much money can be spent.

B. Use the predefined Billing Account Administrator role for the Billing Administrator group, and assign Mahesh to the group. Create a project budget. Configure billing alerts to be sent to the Billing Administrator group. Use resource quotas to cap how many resources can be deployed.

C. Use the predefined Billing Account Administrator role for the Billing Administrator group, and assign Mahesh to the group. Create a project budget. Configure billing alerts to be sent to the Billing Account Administrator. Use resource quotas to cap how much money can be spent.

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Setting up cost controls with quota

Google Cloud

Test Your Knowledge

Your customer is moving their corporate applications to Google Cloud. The security team wants detailed visibility of all resources in the organization. You use Resource Manager to set yourself up as the Organization Administrator. Which Cloud Identity and Access Management (Cloud IAM) roles should you give to the security team while following Google recommended practice

A. Organization viewer, Project owner

B. Organization viewer, Project viewer

C. Organization administrator, Project browser

D. Project owner, Network administrator

Google Cloud

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Google Cloud

Google Cloud Enterprise Foundations Blueprint

- Describes the best practices to use when deploying a resources in Google Cloud
- A well-designed foundation provides consistent management, security, scaling, visibility, and shared services for all Google Cloud workloads.

Cloud Architecture Center

Was this helpful? 👍 👎

Enterprise foundations blueprint 🔖 ▾

Send feedback

Last reviewed 2023-12-20 UTC

This content was last updated in December 2023, and represents the status quo as of the time it was written. Google's security policies and systems may change going forward, as we continually improve protection for our customers.

This document describes the best practices that let you deploy a foundational set of resources in Google Cloud. A cloud foundation is the baseline of resources, configurations, and capabilities that enable companies to adopt Google Cloud for their business needs. A well-designed foundation enables consistent governance, security controls, scale, visibility, and access to shared services across all workloads in your Google Cloud environment. After you deploy the controls and governance that are described in this document, you can deploy workloads to Google Cloud.

The *enterprise foundations blueprint* (formerly known as the *security foundations blueprint*) is intended for architects, security practitioners, and platform engineering teams who are responsible for designing an enterprise-ready environment on Google Cloud. This blueprint consists of the following:

https://cloud.google.com/architecture/security-foundations

Google Cloud

Technical Review:

Security
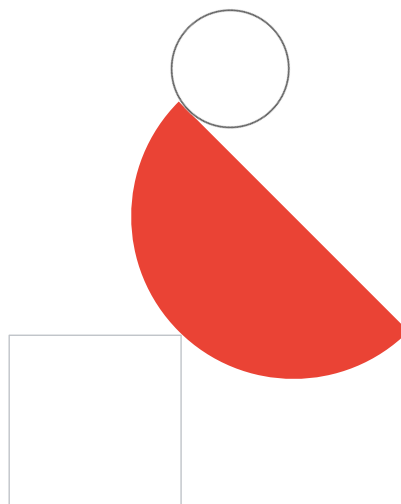
Test Your Knowledge

You are creating an website for internal employees that will run on App Engine. What is the easiest way to to ensure that only authenticated employees have access to the site?

A. Create an authentication page as part of the App Engine website. Create a Firestore backend to store the names and passwords of of the employees who are allowed to use the site. Create a second application to be used by admins to manage the logins for the allowed employees into the Firestore database.

B. Create an authentication page as part of the App Engine website. Use Cloud SQL as the backend to store the names and passwords of of the employees who are allowed to use the site. Admins will update a Cloud SQL table to store the login information

C. Enable IAP for the project that contains the App Engine website. Admins will create a group for the employees who have access and grant the group the IAP-secured Web App User IAM role along with other needed roles.

D. Enable IAP for the project that contains the App Engine website. Admins will create a group for the employees who will have access and grant the group the IAP-secured Tunnel User IAM role along with other needed roles.

Google Cloud

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Authenticate users with Google Accounts

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Google Cloud

Test Your Knowledge

Cymbal Direct must meet compliance requirements. You need to ensure that employees with valid accounts cannot access their VPC network from locations outside of its secure corporate network, including from home. You also want a high degree of visibility into network traffic for auditing and forensics purposes. What should you do?

A. Enable Identity-Aware Proxy (IAP) to allow users to access services securely. Use Google Cloud's operations suite to view audit logs for the networks you need to monitor.

B. Enable VPC Service Controls, and use Google Cloud's operations suite to view audit logs for the networks you need to monitor.

C. Enable VPC Service Controls, define a network perimeter to restrict access to authorized networks, and enable VPC Flow Logs for the networks you need to monitor.

D. Ensure that all users install Cloud VPN. Enable VPC Flow Logs for the networks you need to monitor.

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[VPC Service Controls](#)

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D. Ensure that all users install Cloud VPN. Enable VPC Flow Logs for the networks you need to monitor.

Google Cloud

Technical Review:
Networking
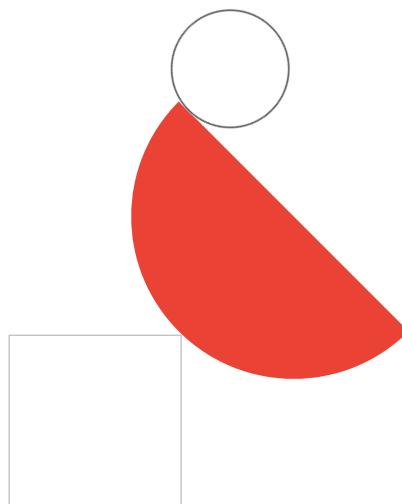
Test Your Knowledge

Your client is going to implement a web based application using Managed Instance Groups that will consist of 3 tiers: the frontend tier, a middle tier and a backend tier. Your client is very security conscious and wants to be sure that nothing has access to the backend tier except for the middle tier. What do you recommend?

A. Use VPC Service Controls. Put the backend tier on one project, and the other two tiers in another project. Set up a perimeter around all projects

B. Use Firewall Rules based on service accounts. Attach one service account to the middle tier systems and attach another one to the backend tier systems. Create an ingress firewall rule that allows communications among systems using these service accounts.

C. Use Private Google Access to allow communication between the middle tier and the backend tier, and nothing else.

D. Use Firewall Rules based on tags. Give the middle tier systems a tag of "mt" and the backend tier systems a tag of "be". Create an ingress firewall rule that allows access to systems with the "be" tag from systems with the "mt" tag.

Google Cloud

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Filter by service account versus network tag

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Google Cloud

Test Your Knowledge

Your organization has a website running on Compute Engine. This instance only has a private IP address. You need to provide SSH access to a developer who needs to debug the website from anywhere.   How do you enable this in the most secure way possible?

A. Set up Cloud VPN. Set up an unencrypted tunnel to one of the hosts in the network. Create an egress firewall rules. Use the private IP address to log in using a gcloud ssh command.

B. Use SOCKS proxy over SSH. Set up an SSH tunnel to one of the hosts in the network. Create the SOCKS proxy on the client side.

C. Create a VPC ingress firewall rule for port 22 for TCP protocol using the Google Cloud Console to allow ingress from anywhere. Grant the developer the IAP-Secured Tunnel User role and the Compute Instance Admin roles.

D. Enable IAP within the project. Create a ingress firewall rules for TCP port 22 from the IP range 35.235.240.0/20. Grant the developer the IAP-Secured Tunnel User and the Compute Instance Admin roles

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Using IAP for TCP forwarding

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Test Your Knowledge

Your project requires that VMs do not have public IP addresses. Developers are creating an application that will run on the VMs. The application needs access to data stored in a Cloud Storage bucket. How would you provide access to the Cloud Storage bucket from the VMs?

A. Enable Private Google Access on the subnet.

B. Enable VPC Service Controls on the subnet.

C. Enable Identity-Aware Proxy (IAP) on the subnet.

D. Enable Cloud VPN between the VMs and Cloud Storage.

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Private Google Access

Google Cloud

Test Your Knowledge

You have several Compute Engine instances running NGINX and Tomcat for a web application fronted by a HTTPS load balancer. In your web server logs, many login failures come from a single IP address, which looks like a brute force attack. What is the best way to block this traffic?

A. Create a Cloud Armor security policy with a rule to deny access to the IP address. Attach the policy to the backend service of the load balancer.

B. Create a VPC firewall rule to deny ingress from traffic coming from that IP address and assign it a high priority

C. Use VPC Service Controls and set a perimeter around the Compute Engine instances.

D. Use Network Intelligence Center to gain visibility into network configurations to detect the misconfigurations which are allowing this to occur

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[Security policy overview](#)

Google Cloud

Test Your Knowledge

Cymbal Direct is working with Cymbal Retail, a separate, autonomous division of Cymbal with different staff, networking teams, and data center. Cymbal Direct and Cymbal Retail are not in the same Google Cloud organization. Cymbal Retail needs access to Cymbal Direct's web application for making bulk orders, but the application will not be available on the public internet. You want to ensure that Cymbal Retail has access to your application with low latency. You also want to avoid egress network charges if possible. What should you do?

A. Verify that the subnet Cymbal Retail is using has the same IP address range with Cymbal Direct's subnet range, and then enable VPC Peering for the project.

B. Specify Cymbal Direct's project as the Shared VPC host project, and then configure Cymbal Retail's project as a service project.

C. Verify that the subnet range Cymbal Retail is using doesn't overlap with Cymbal Direct's subnet range, and then enable VPC Peering for the project.

D. If Cymbal Retail does not have access to a Google Cloud data center, use Carrier Peering to connect the two networks

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[VPC Network Peering](#)

Google Cloud

Test Your Knowledge

You are creating a new project. You plan to set up a Dedicated interconnect between two of your data centers in the near future and want to ensure that your resources are only deployed to the same regions where your data centers are located. You need to make sure that you don't have any overlapping IP addresses that could cause conflicts when you set up the interconnect. What should you do?

A. Create a new project, leave the default network in place, and then use the default 10.x.x.x network range to create subnets in your desired regions.

B. Create a new project, delete the default network, set up an auto mode VPC network, and then use the default 10.x.x.x network range to create subnets in your desired regions.

C. Create a new project, delete the default network, set up the network in custom mode, and then create subnets in your desired zones. Use VPC Network Peering to connect the zones in the same region to create regional networks.

D. Create a new project, delete the default network, set up the network in custom mode, and create subnets in your desired regions, ensuring the IP addresses assigned to the subnet do not overlap with those used in your data centers.

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[VPC subnets](#)

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Test Your Knowledge

You need to deploy a load balancer for a web-based application with multiple backends in different regions. You want to direct traffic to the backend closest to the end user, but also to different instance group backends based on the URL the user is accessing. Which of the following could be used to implement this?

A. The request is received by the SSL proxy load balancer, which uses a global forwarding rule to check the URL map, then sends the request to the appropriate backend service.

B. The request is matched by a URL map and then sent to a global external HTTP(S) load balancer. A global forwarding rule sends the request to a target proxy, which selects the appropriate backend service.

C. The request is matched by a URL map and then sent to a SSL proxy load balancer. A global forwarding rule sends the request to a target proxy, which selects the appropriate backend service.

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[Cloud Load Balancing overview](#)

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Technical Review:

Compute Resources
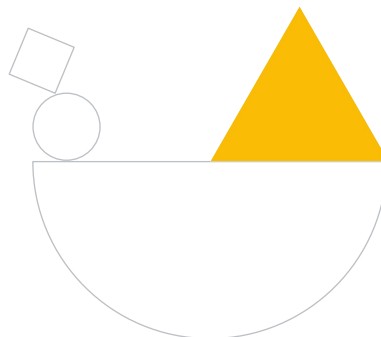
Test Your Knowledge

For compliance reasons, your client cannot create VMs on servers which host VMs belonging to other organizations. What do you recommend they do?

A. Create Shielded VMs

B. Create Confidential VMs

C. Create Sole tenant VMs

D. Create any type of Compute Engine instance

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Sole-tenancy overview

Google Cloud

Test Your Knowledge

Your customer moved an application that was running in a VM on-premise to a Compute Engine VM. The VM size they selected in Google Cloud was based on the CPU/Memory that the on-premise VM contained. They are complaining to you about the monthly cost. What do you recommend they do?

A. Suggest they move the application back to the VM located on-premise. That is the most cost effective way of running this particular application.

B. Suggest they install the the Ops Agent on the VM, then use Cloud Monitoring to track the maximum amount of CPU and memory their application is using. Create a custom VM using those numbers as the basis for CPU and memory allocated to the instance

C. Suggest they switch to using Bare Metal machines, so that they can bring their own licenses to Google Cloud.

D. Suggest they switch to one of the available E2 Compute Engine instance types, as they are designed to be the most cost effective

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Ops Agent overview

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Google Cloud

Test Your Knowledge

Your customer is running a large Oracle database on-premise and wants to move it to Google Cloud. What do you suggest they do?

A. Use the database migration wizard and migrate the database into a Compute Engine instance

B. Use Spanner instead

C. Use a Bare Metal server

D. Use Cloud SQL instead

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Bare Metal Solution overview

Google Cloud

Test Your Knowledge

Your customer wants to run a fault-tolerant application in Compute Engine at low cost. Which option should you suggest?

A. Use E2 shared-core VM instances

B. Use Spot/Preemptible Instances

C. Use Sole tenant instances

D. Containerize the application and deploy it to Cloud Run instead.

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[Preemptible VM instances](#)

[Spot VMs](#)

Google Cloud

Test Your Knowledge

You have a customer who wants to create a container-based, stateless web application in Google Cloud. They have no idea how popular the website will be. They prefer not to manage servers if they can avoid it. What GCP service would you recommend?

A. Use Managed Instance Groups and scale based on load

B. Use Cloud Run with autoscaling

C. Use Kubernetes Engine with spot VM nodes, scaling as needed

D. Use App Engine Standard with autoscaling

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What is Cloud Run

Google Cloud

Test Your Knowledge

You have containerized multiple applications using Docker and have deployed them using Compute Engine VMs. You want to save costs and simplify container management. What might you do?

A. Write Terraform scripts for all deployment.

B. Rewrite the applications to run in App Engine.

C. Rewrite the applications to run in Cloud Functions.

D. Migrate the containers to GKE

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Containers on Compute Engine
GKE overview

Technical Review:
Design and Process

Test Your Knowledge

Cymbal's Site Reliability Engineering team does toil work to archive unused data in tables within your application's relational database. This toil is required to ensure that your application has a low Latency Service Level Indicator (SLI) to meet your Service Level Objective (SLO). Toil is preventing your team from focusing on a high-priority engineering project that will improve the Availability SLI of your application. You want to reduce repetitive tasks to avoid burnout, improve organizational efficiency, and follow the Site Reliability Engineering recommended practices. What should you do?

A. Identify repetitive tasks that contribute to toil and onboard additional team members for support.

B. Identify repetitive tasks that contribute to toil and automate them.

C. Change the SLO of your Latency SLI to accommodate toil being done less often. Use this capacity to work on the Availability SLI engineering project.

D. Assign the Availability SLI engineering project to the Software Engineering team.

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[Identifying and tracking toil using SRE principles](#)

Google Cloud

Test Your Knowledge

Cymbal Direct releases new versions of its drone delivery software every 1.5 to 2 months. Although most releases are successful, you have experienced three problematic releases that made drone delivery unavailable while software developers rolled back the release. You want to increase the reliability of software releases and prevent similar problems in the future. What should you do?

A. Adopt a "waterfall" development process. Maintain the current release schedule. Ensure that documentation explains how all the features interact. Ensure that the entire application is tested in a staging environment before the release. Ensure that the process to roll back the release is documented.

B. Adopt a "waterfall" development process. Maintain the current release schedule. Ensure that documentation explains how all the features interact. Automate testing of the application. Ensure that the process to roll back the release is well documented.

C. Adopt an "agile" development process. Reduce the time between releases as much as possible. Automate the build process from a source repository, which includes versioning and self-testing. Use a canary deployment to detect issues that could cause rollback.

D. Adopt an "agile" development process. Maintain the current release schedule. Automate build processes from a source repository. Automate testing after the build process. Deploy the previous version if problems are detected and you need to roll back.

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Use a canary deployment strategy

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Test Your Knowledge

Cymbal Direct needs to use a tool to deploy its infrastructure. You want something that allows for repeatable deployment processes, uses a declarative language, and allows parallel deployment. You also want to deploy infrastructure as code on Google Cloud and other cloud providers. What should you do?

A. Develop in Docker containers for portability and ease of deployment.

B. Automate the deployment with Cloud Deployment Manager.

C. Automate the deployment with Terraform scripts.

D. Use Google Kubernetes Engine (GKE) to create deployments and manifests for your applications.

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Predictable serverless deployments with Terraform

Google Cloud

Test Your Knowledge

You are implementing a disaster recovery plan for the cloud version of your drone solution. Sending videos to the pilots is crucial from an operational perspective. What design pattern should you choose for this part of your architecture?

A. Hot with a low recovery time objective (RTO)

B. Cold with a low recovery time objective (RTO)

C. Warm with a high recovery time objective (RTO)

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Disaster recovery planning guide

Google Cloud

Test Your Knowledge

You have an application implemented on Compute Engine. You want to increase the durability of your application. What should you do?

A. Monitor your application's usage metrics and implement autoscaling.

B. Implement a regional managed instance group.

C. Perform health checks on your Compute Engine instances.

D. Implement a scheduled snapshot on your Compute Engine instances.

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Best practices for Compute Engine disk snapshots

Google Cloud

Test Your Knowledge

Developers on your team frequently write new versions of the code for one of your applications. You want to automate the build process when updates are pushed to Cloud Source Repositories. What should you do?

A. Implement a Cloud Build trigger that references your repository and branch.

B. Run the "docker build" command on the code in your repository

C. Upload application updates and Cloud Build configuration files to Cloud Storage.

D. Have the Source Repository push a message to a Pub/Sub topic when the updates arrive. Cloud Build will run in response to the message.

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Cloud Build triggers

Google Cloud

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Cymbal Direct wants to improve its drone pilot interface. You want to collect feedback on proposed changes from the community of pilots before rolling out updates systemwide. What type of deployment pattern should you implement?

A. You should implement A/B testing.

B. You should implement canary testing.

C. You should implement an in-place release.

D. You should implement a blue/green deployment.

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Application deployment and testing strategies

Google Cloud

Test Your Knowledge

The pilot subsystem in your Delivery by Drone service is critical to your service. You want to ensure that connections to the pilots can survive a VM outage without affecting connectivity. What should you do?

A. Implement a managed instance group and load balancer.

B. Configure proper startup scripts for your VMs.

C. Create persistent disk snapshots.

D. Deploy a load balancer to distribute traffic across multiple machines.

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Instance groups

Google Cloud

Test Your Knowledge

You need to adopt Site Reliability Engineering principles and increase visibility into your environment. You want to streamline the process of reacting to issues, and want to ensure that only trusted container images are deployed to production. You are using Cloud Trace, Cloud Logging, and Cloud Monitoring for monitoring, alerting, and dashboards. What else should you do?

A. Page the on-call contact about novel issues or events that haven't been seen before. Use GNU Privacy Guard (GPG) to check container image signatures and ensure that only signed containers are deployed.

B. Page the on-call contact about issues that violate an SLO or events that haven't been seen before. Use Binary Authorization to ensure that only signed container images are deployed.

C. Page the on-call contact when issues that affect resources in the environment are detected. Use Binary Authorization to ensure that only signed container images are deployed.

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[Binary Authorization](#)

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Additional review resources

- [Google Cloud YouTube channel](#)
- [Google Cloud documentation](#)
- [Cloud Architecture Center](#)
- [Google Cloud security best practices center](#)
- [Google Cloud blog](#)
- [Google Cloud white papers](#)
- [Google Cloud samples](#)
- [Google Cloud codelabs](#)
- [Google Cloud Partner Advantage](#)

Google Cloud

General test taking best practices
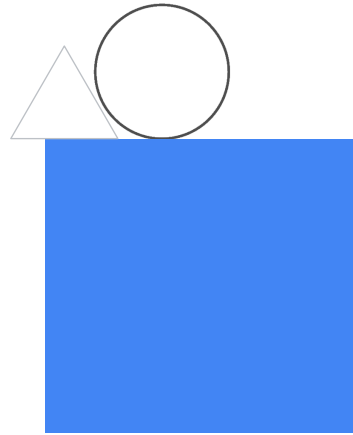
Common Themes

- Choose Google Cloud Products and Services
  - This is a test about Google Cloud

- Value for the customer
  - Minimize spend, maximize solution

- Lowest latency
  - Closer to the consumer is faster

Google Cloud

Common Themes

- Minimize administration
  - Managed services free people up

- Proven product combinations
  - If every streaming lab you have done implements
    - *Pub/Sub -> Dataflow -> BigQuery*
      - - OR -
    - *Pub/Sub -> BigQuery*
  - good chance those are options you should pick

Strategy

- **<u>Prioritize your time</u>**
    - The allotted test time is 120 minutes
    - You will be presented with 50 to 60 questions
    - This means 2 minutes per question including review

- **<u>Stay Agile</u>**
    - **Do not get stuck on a single question! Mark for review and move on.**

- **<u>Answer every question</u>**
    - An empty answer is zero points
    - Incorrect answers are not deducted from your test score
    - An informed guess is always better than no answer

Strategy

- **Utilize every second**
  - This will increase your odds of success

- **Review every question**
  - If you follow the strategy of three categories you will be left with plenty of time to review every question

Advanced Strategy: Evaluate, Answer, Move on...

- **Use one of the below strategies dictated by your confidence in your answer**
  - Category 1: "I know the answer with 99% confidence"
    - **Answer question**
    - Mark for review

  - Category 2: "I think I can figure this out quickly"
    - Eliminate wrong answers, look for key terms, **apply educated guess**
    - Mark for review

  - Category 3: "I don't know this immediately or perhaps at all"
    - Follow above strategy, and make a guess. Unanswered questions count against you. You could run out of time and not be able to review all questions
    - Mark for review

Advanced Strategy: Evaluate, Answer, Move on…

- **When you reach the final question**
  - Take a breath!

  - Start reviewing from question 1
    - You now have a *smaller* test because the category 1 questions have been answered

  - Approach the category 2 questions
    - Some category 2 questions may now be perfectly clear as you are ***in the zone***
    - Invest some time to think them through

  - On the third run through
    - Spend as much time as you have left on the category 3 questions

Remember

- **Stay Agile**
    - **Do not get stuck on a single question! Mark for review and move on.**

- **Answer every question**
    - An empty answer is zero points
    - Incorrect answers are not deducted from your test score
    - An informed guess is always better than no answer

Post Exam

- A PASS/FAIL confirmation is displayed shortly after clicking the Submit button

- A final confirmation is emailed after the exam within a few days

- Can check exam pass/fail status on https://www.webassessor.com/
  - Login to your account and click the "My Assessments" button
  - Scroll down to see your result

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Evaluating Options

These questions review techniques to use while
evaluating questions and answers during the exam

Types of Questions

- Multiple Choice
  - Select the correct answer out of four provided ones
  - Often there is more than one answer that could be correct
  - You are looking for the **BEST** answer

- Multiple Select
  - Select the best two out of five or three out of five provided answers
  - This question format can be surprisingly difficult
  - The answers will represent the **BEST** combination relative to the question presented

Types of Questions

- Multiple choice questions, single or multiple answer
    - Question will indicate # of answers required if more than one

You are a project owner and need your co-worker to deploy a new version of your application to App Engine. You want to follow Google's recommended practices. Which IAM roles should you grant your co-worker?

○ A. Project Editor

○ B. App Engine Service Admin

○ C. App Engine Deployer

○ D. App Engine Code Viewer

Your company has a mission-critical application that serves users globally. You need to select a transactional, relational data storage system for this application. Which two products should you choose?

☐ A. BigQuery

☐ B. Cloud SQL

☐ C. Cloud Spanner

☐ D. Cloud Bigtable

☐ E. Cloud Datastore

Single answer question

Multiple answer question

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Mock up of exam question

Qn. 2 of 40

Time Left: 1:20:52

Question #
and total

Timer

You are a project owner and need your co-worker to deploy a new version of
your application to App Engine. You want to follow Google's recommended
practices. Which IAM roles should you grant your co-worker?

○ A. Project Editor

○ B. App Engine Service Admin

○ C. App Engine Deployer

○ D. App Engine Code Viewer

Click to mark
question for review

☐ Mark for Review

Previous

Next

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Mock up - last exam question

Time Left: 0:03:40

You are a project owner and need your co-worker to deploy a new version of
your application to App Engine. You want to follow Google's recommended
practices. Which IAM roles should you grant your co-worker?

○ A. Project Editor

○ B. App Engine Service Admin

○ C. App Engine Deployer

○ D. App Engine Code Viewer

Click here to review
marked questions

☐ Mark for Review   Previous   Review   Submit

Google Cloud

Question review

Time Left: 0:02:30

1	11 *	21	31
2	12	22	32
3 *	13	23	33 *
4	14	24	34 *
5	15 *	25	35
6	16	26	36
7	17	27	37 *
8 *	18	28 *	38
9	19	29 *	39
10	20	30 *	40

Marked questions have an "*"

Submit

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Question 1:

You have a large number of files in a directory to copy to Cloud Storage.
You want to parallelize it.
Which command should you use?

```
A. gcloud -m cp -r dir gs://company-name/bu/project/my-bucket
B. gcloud -p cp -r dir gs://company-name/bu/project/my-bucket
C. gsutil -m cp -r dir gs://company-name/bu/project/my-bucket
D. gsutil -p cp -r dir gs://company-name/bu/project/my-bucket
```

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Recognize that some answers have duplicate segments.

Remove the duplicate segments as they are not important.

Question 1:

You have a large number of files in a directory to copy to Cloud Storage.
You want to parallelize it.
Which command should you use?

A. gcloud -m ~~cp -r dir gs://company-name/bu/project/my-bucket~~
B. gcloud -p ~~cp -r dir gs://company-name/bu/project/my-bucket~~
C. gsutil -m ~~cp -r dir gs://company-name/bu/project/my-bucket~~
D. gsutil -p ~~cp -r dir gs://company-name/bu/project/my-bucket~~

Identify duplicate segments and ignore.

Two answers are definitely wrong, two answers are possibly correct.

Question 1:

You have a large number of files in a directory to copy to Cloud Storage.
You want to parallelize it.
Which command should you use?

A. ~~gcloud -m cp -r dir gs://company-name/bu/project/my-bucket~~
B. ~~gcloud -p cp -r dir gs://company-name/bu/project/my-bucket~~
C. gsutil -m ~~cp -r dir gs://company-name/bu/project/my-bucket~~
D. gsutil -p ~~cp -r dir gs://company-name/bu/project/my-bucket~~

Remove the wrong group.
You now have a 50% chance of being correct.

Note: In multiple skills boost labs, that you have completed, the correct syntax of
gcloud and gsutil commands was presented.

Question 1:

You have a large number of files in a directory to copy to Cloud Storage.
You want to parallelize it.
Which command should you use?

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A. gcloud  -m cp  -r dir gs://company-name/bu/project/my-bucket
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C. gsutil -m cp  -r dir gs://company-name/bu/project/my-bucket
D. gsutil  -p cp  -r dir gs://company-name/bu/project/my-bucket
```

Note: In multiple skills boost labs, that you have completed, the correct syntax of gcloud and gsutil commands was presented.

Question 2:

Your company wants to deploy several microservices to help their system handle elastic loads. Each microservice uses a different version of software libraries. You want to enable the developers to keep their development environment in sync with the various production services.
Which technology should you choose?

Start visualizing what's going on.

What products and services come to mind first?

Question 2:

Your company wants to deploy several microservices to help their system handle elastic loads. Each microservice uses a different version of software libraries. You want to enable the developers to keep their development environment in sync with the various production services.

Which technology should you choose?

Focus on words and phrases that point to products and services.

All other words are noise and can generally be ignored.

Question 2:

Your company wants to deploy several microservices to help their system handle elastic loads. Each microservice uses a different version of software libraries. You want to enable the developers to keep their development environment in sync with the various production services.
Which technology should you choose?

Focus example:

If you had to pick a compute option for microservices workloads, what would it be?

Question 2:

Your company wants to deploy several microservices to help their system handle elastic loads. Each microservice uses a different version of software libraries. You want to enable their developers to keep their development environment in sync with the various production services.
Which technology should you choose?

A. Bare Metal Machines
B. Containers
C. Individual Laptops
D. Virtual machines

1) Look for a solution based on the course notes and labs you completed.

2) Eliminate obvious wrong options.

Question 2:

Your company wants to deploy several microservices to help their system handle elastic loads. Each microservice uses a different version of software libraries. You want to enable their developers to keep their development environment in sync with the various production services.
Which technology should you choose?

A. Bare Metal Machines   *A fringe case*
B. Containers   *Best option*
C. Individual Laptops   *Ridiculous option*
D. Virtual Machines   *Not the best option*

> Verify which answer is BEST -
> Containers support all the
> highlighted points.

Question 3:

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 serverless 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 two)

Question 3:
Your company wants to try out the cloud with <mark>low risk</mark>. They want to archive approximately <mark>100 TB of their log data</mark> to the cloud and test the <mark>serverless analytics</mark> features available to them there, while also retaining that data as a <mark>long-term disaster recovery backup</mark>.
Which two steps should they take? (choose two)

Focus:

Which database is used for serverless analytics?
Which storage option is used for long term storage?
Which storage option would be good for storing backup files?

Question 3:

Your company wants to try out the cloud with <mark>low risk</mark>. They want to archive approximately <mark>100 TB of their log data</mark> to the cloud and test the <mark>serverless analytics</mark> features available to them there, while also retaining that data as a <mark>long-term disaster recovery backup</mark>.

Which two steps should they take? (choose two)

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

Look for your solutions

Eliminate obvious wrong options

Question 3:

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 serverless 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 two)

A. Load logs into BigQuery. *Analytics keyword*

B. Load logs into Cloud SQL. *Not serverless*

C. Import logs into Cloud Logging. *Not long term storage*

D. Insert logs into Cloud Bigtable. *Not best*

E. Upload log files into Cloud Storage. *Long term storage*

Question 4:

You want to set up a real-time analytics platform for a new game.
Which combination of Google technologies will be suitable?

Key Phrase ... What are you looking for?

Question 4:

You want to set up a <mark>real-time analytics platform</mark> for a new game.
Which combination of Google technologies will be suitable?

A. Cloud Dataflow, Cloud Pub/Sub, and BigQuery

B. Cloud SQL, Cloud Storage, Cloud Pub/Sub

C. Cloud Dataproc, Cloud Pub/Sub, Cloud SQL

D. Cloud Pub/Sub, Compute Engine, Cloud Storage

> What combination of products are commonly presented together in labs and course notes as a real-time auto scaling solution.

Question 4:

You want to set up a ==real-time analytics platform== for a new game.
Which combination of Google technologies will be suitable?

A. Cloud Dataflow, Cloud Pub/Sub, and BigQuery   *Winner*

B. Cloud SQL, Cloud Storage, Cloud Pub/Sub   *No analytics at all*

C. Cloud Dataproc, Cloud Pub/Sub, Cloud SQL   *No mention of Dataproc or Hadoop*

D. Cloud Pub/Sub, Compute Engine, Cloud Storage   *Possible, but not the best choice*

Question 5:

Your company has a mission-critical application that serves users globally. You need to select a transactional, relational data storage system for this application.

Which two products should you choose?

Key Words ... What are you looking for?

Which database services are transactional and relational?

Which of them are global?

Question 5:

Your company has a mission-critical application that serves users <mark>global</mark>ly. You need to select a <mark>transactional</mark>, <mark>relational</mark> data storage system for this application.

Which two products should you choose?

A. BigQuery

B. Cloud SQL

C. Cloud Spanner

D. Cloud Bigtable

E. Cloud Datastore

What Google Cloud database services are relational and which are NoSQL?

Question 5:

Your company has a mission-critical application that serves users <mark>global</mark>ly.
You need to select a <mark>transactional</mark>, <mark>relational</mark> data storage system for this application.
Which two products should you choose?

A. BigQuery   *Not Transactional*

B. Cloud SQL

C. Cloud Spanner

D. Cloud Bigtable   *Not Relational*

E. Cloud Datastore   *Not Relational*

Thank you

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