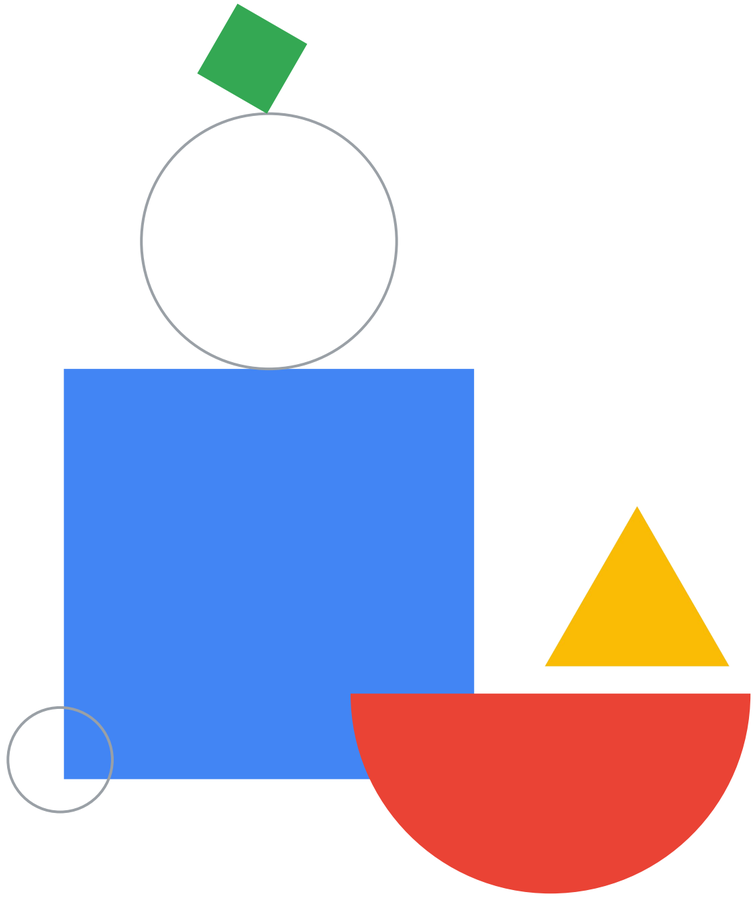
Google Cloud

Preparing for Your Professional Cloud Architect Journey



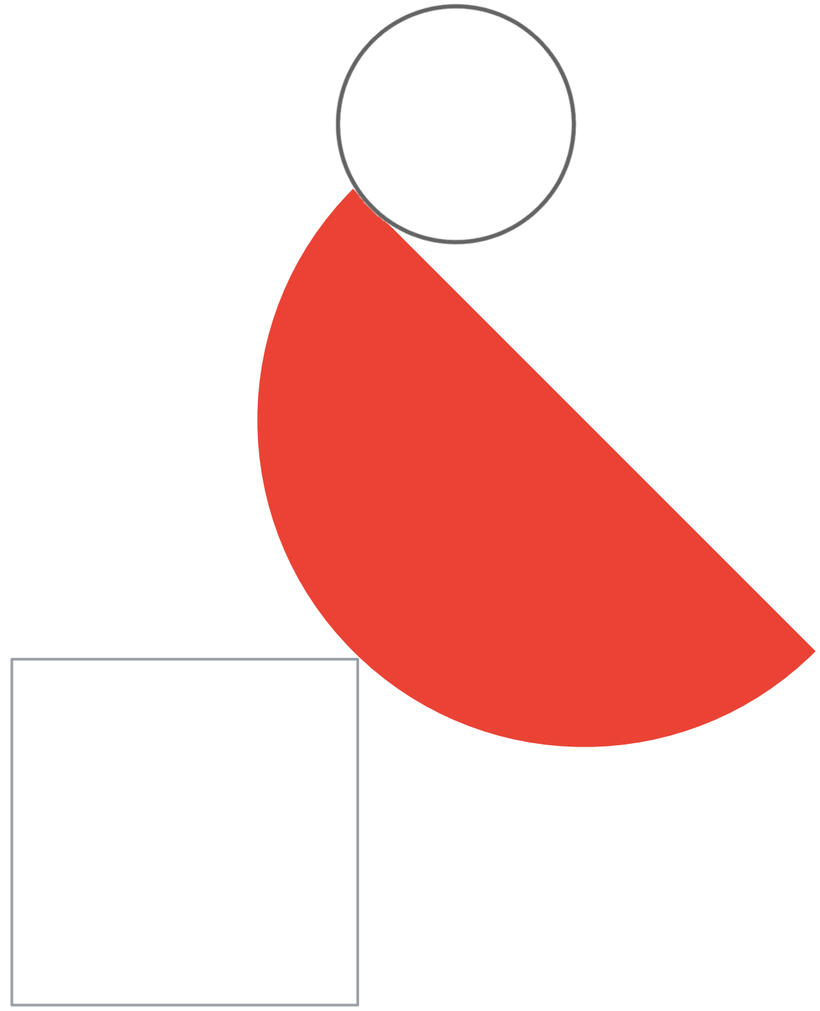
Module 6: Case Study Preparation and Your Next Steps

Module agenda

01 Analyzing a case study

02 Weekly study goals

Analyzing a case study



Professional Cloud Architect Certification Exam Guide

Case study process

1

Understand the overarching goals

2

Identify and itemize objectives

3

Categorize and prioritize objectives

4

Analyze

5

Determine preliminary options

6

Refine options

7

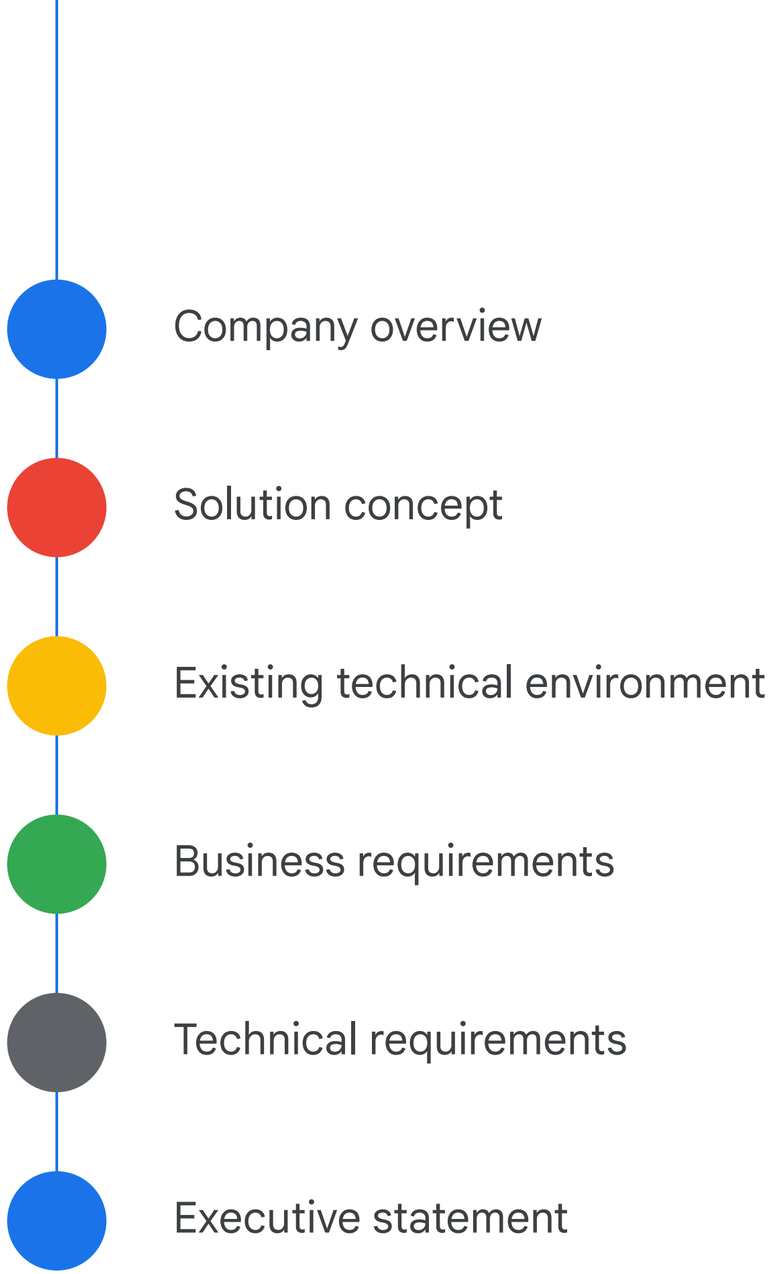
Identify final solution

Use Dress4Win to demonstrate analyzing a case study

Dress4Win is a case study for the *previous version* of the Professional Cloud Architect exam.

You should have read the case study and be familiar with it at a high level.

Case study format

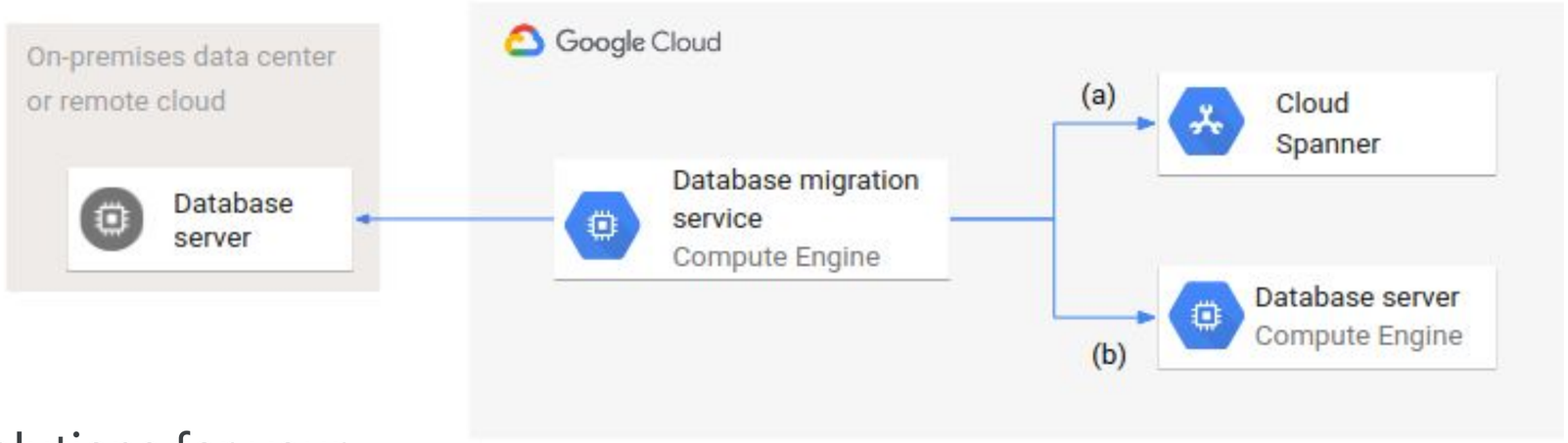


Understand the overarching goals

- Before analyzing the details of the case study, simply read it.
- Identify the case study organization's broad goals and objectives.

Look for reference architectures that address the overarching goals

- Look at how other architects design their environments.
- Use Google provided resources and reference architectures to design your solution.
- They aren’t always drop-in solutions for your entire environment, but you can often combine two or three into a new solution.



Identify objectives first

- Read the case study or talk to stakeholders and take notes
- Identify objectives

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

Itemize objectives after identifying them

- Create a list from the identified objectives
- This will ensure you do not miss any objectives when analyzing them
- This will also allow you to more easily identify repeated indicators.

Growth is mentioned a lot, that could mean it's important

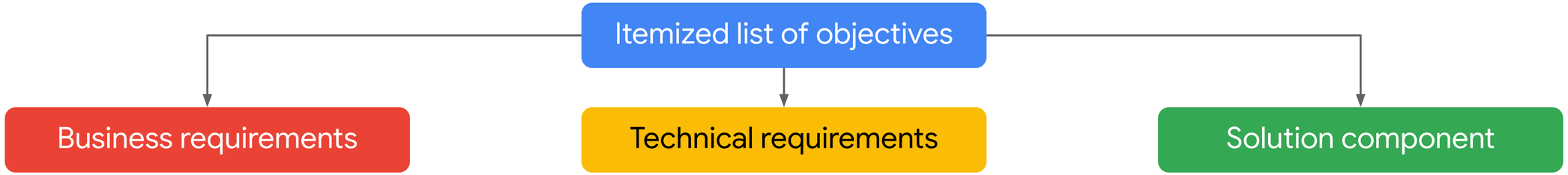
- Dress4Win is a web-based using a web app and mobile application.
- The company also cultivates an active social network that connects their users with designers and retailers.
- They monetize their services through advertising, ecommerce, referrals, and a freemium app model.
- The application has grown [organically] 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.

Identify & Itemize Objectives

- Review list of objectives
- Remove duplicates
- Simplify

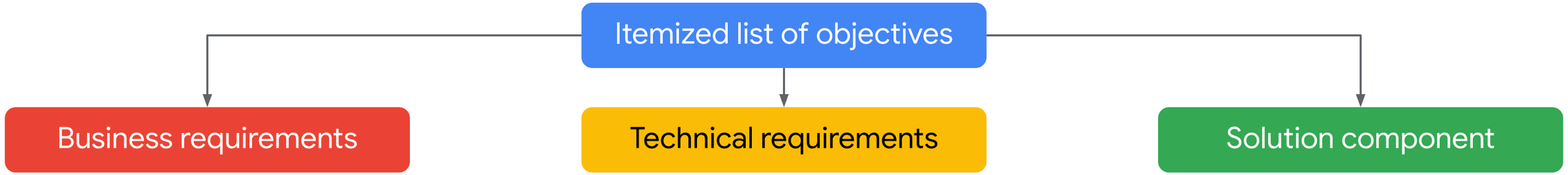
Objective	Notes
Web application	
Social network	Active, want to monetize
Mobile app	Firestore?
Migrate several hundred servers in colocation facility	Connectivity?
Growth, ensure ability to scale	Multiple mentions
Innovate faster	

Categorizing Objectives



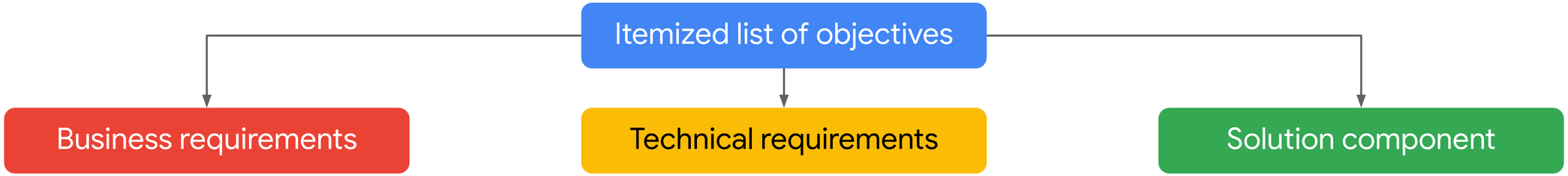
Objective	Notes	Existing Infrastructure	Business Requirement	Technical Requirement
Web application		x		
Social Network	Active, want to monetize	x		
Mobile App	Firestore?	x		
Migrate several hundred servers in colocation facility	Connectivity?	x		x
Ensure ability to scale	Multiple mentions		x	x
Innovate Faster			x	

Categorizing Objectives



- 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

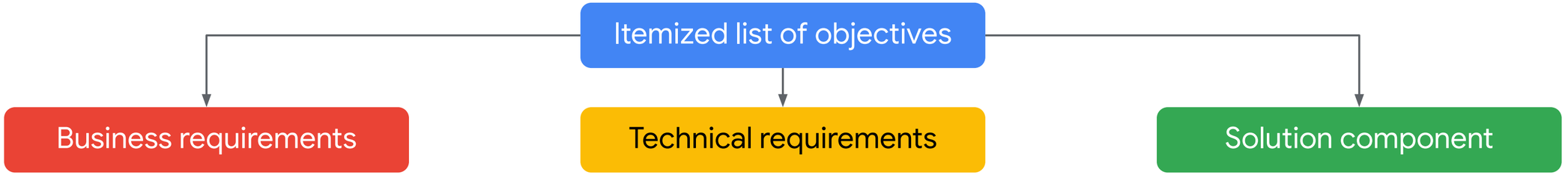
Categorizing Objectives



- 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

- Easily create non-production environments in the cloud
- Implement an automation framework for provisioning resources in cloud
- Implement a continuous deployment process for deploying applications to the on-premises data center 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.

Categorizing Objectives



- Build a reliable and reproducible environment
- Improve security
- Improve business agility and speed of innovation
- Analyze and optimize architecture for performance

- Create non-production environments in the cloud
- Implement an automation framework
- Implement a continuous deployment process ns
- Support failover of the production environment to cloud during an emergency
- Encrypt data on the wire and at rest
- Support multiple private connections

Databases:

- MySQL. One server for user data, inventory, static data
  - MySQL 5.7
  - 8 core CPUs
  - 128 GB of RAM
  - 2x 5 TB HDD (RAID 1)

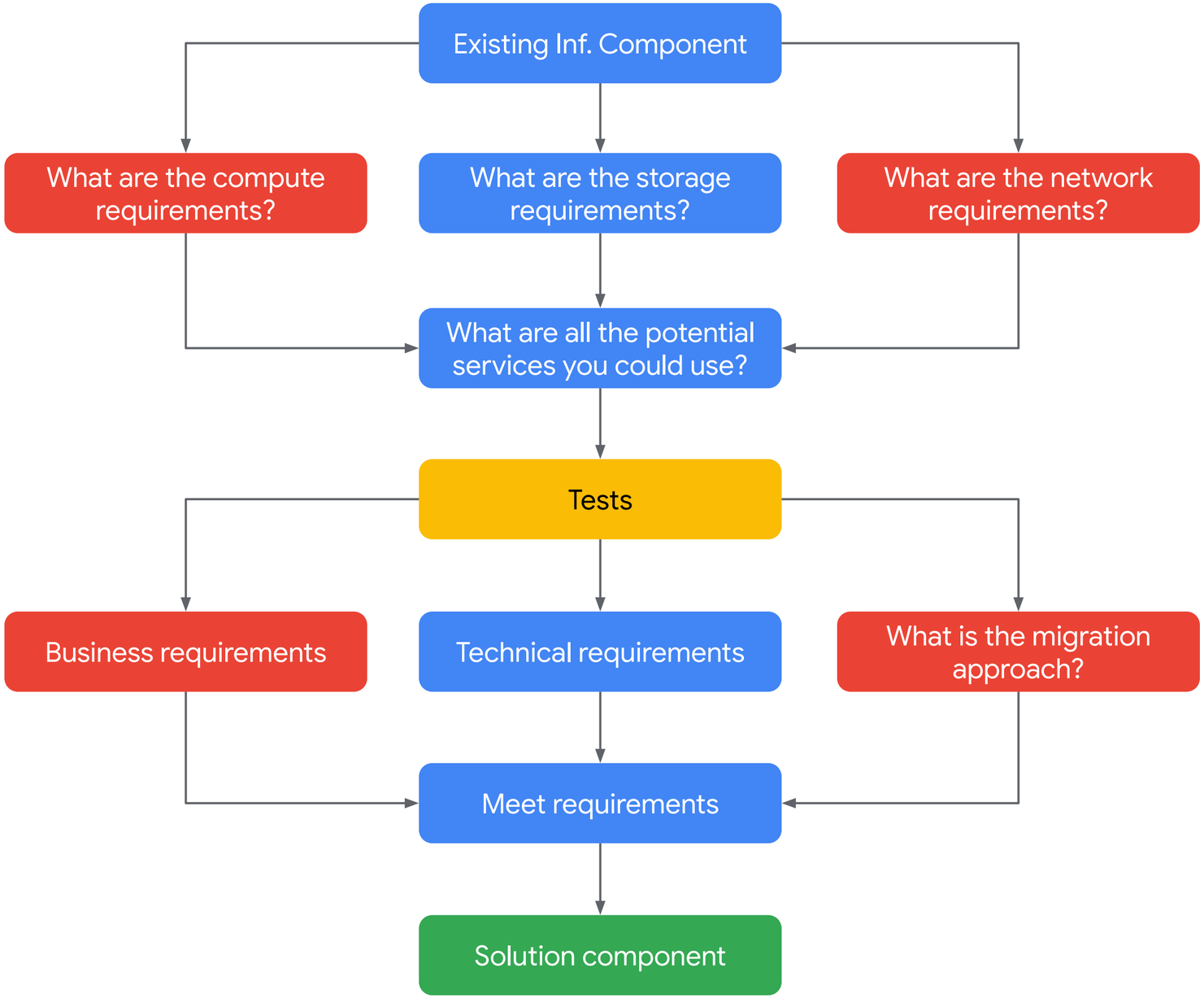
Compute:

- 40 web application servers providing micro-services based APIs and static content
  - Tomcat - Java
  - Nginx
  - Four core CPUs
  - RAM

... more in actual case study

Analyzing components

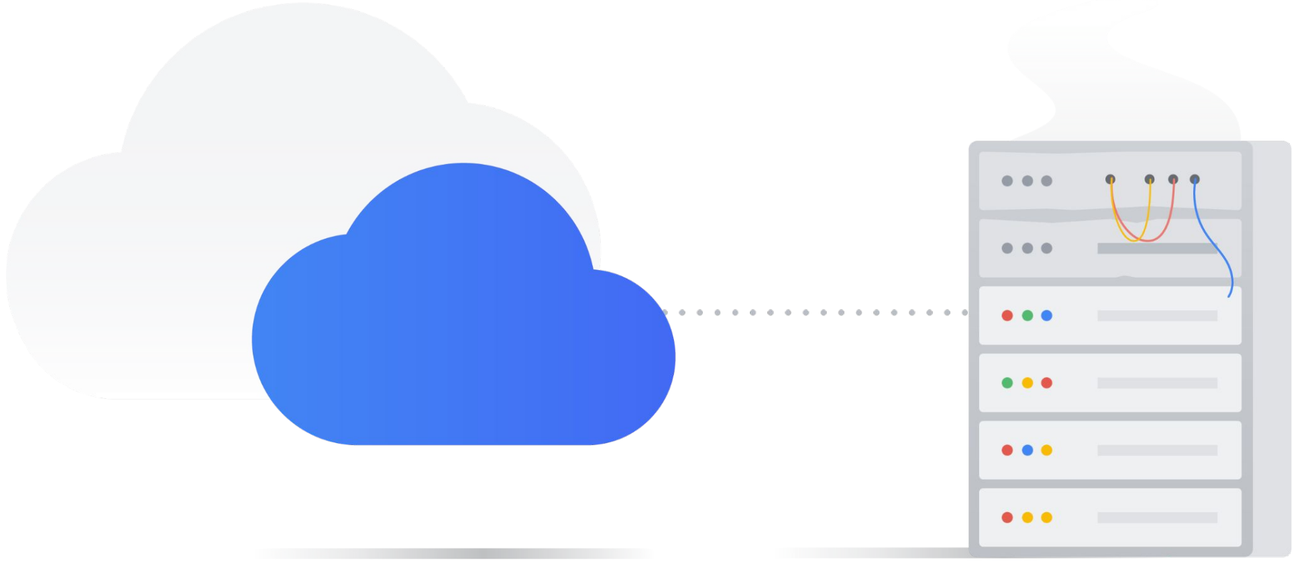
When analyzing components, start by asking questions.



Potential connectivity solutions

Support multiple private connections between the production data center and cloud environment

1. Cloud VPN
2. Partner Interconnect
3. Dedicated Interconnect



Evaluating potential connectivity solutions

Support multiple private connections between the production data center and cloud environment

1. Cloud VPN
2. ~~Partner Interconnect~~
3. Dedicated Interconnect

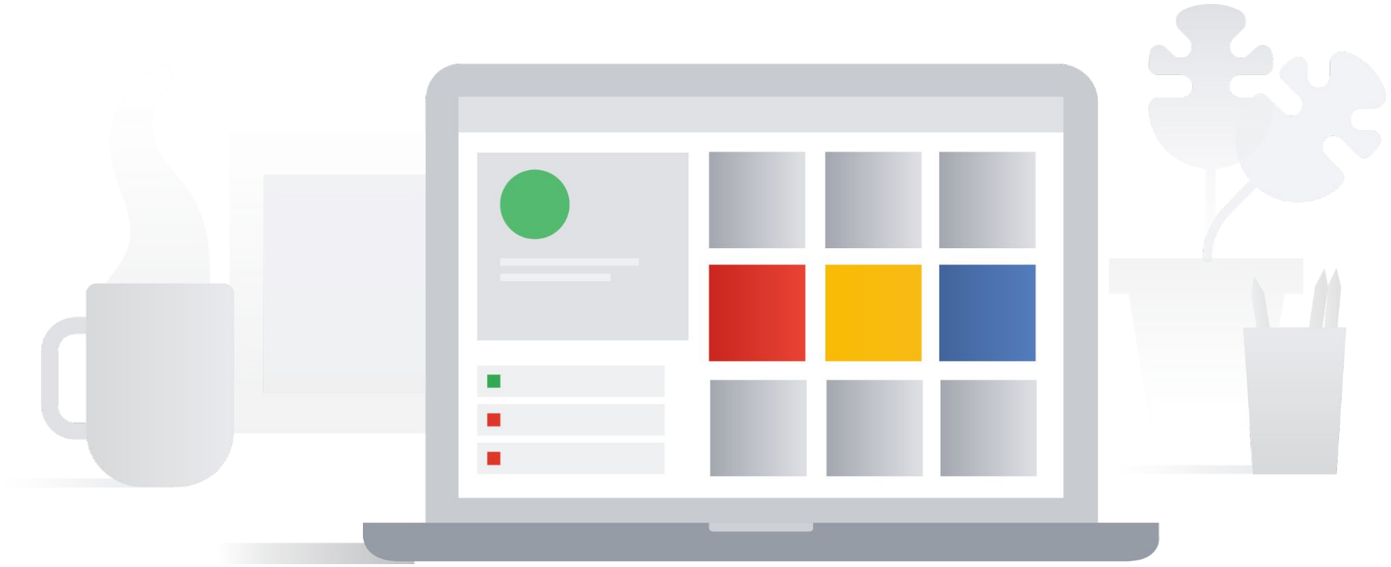
- If a dedicated interconnect is possible, this is the best solution.
  - We can have multiple interconnects for HA
- A partner interconnect would only be used if a dedicated Interconnect can not be used.
- Cloud VPN provides regional HA if deployed in a different region.

Potential messaging and social options

Three RabbitMQ servers for messaging, social notifications, and events

- Eight core CPUs
- 32GB of RAM

1. RabbitMQ on Compute Engine
2. Pub/Sub



Evaluating potential messaging and social options

Three RabbitMQ servers for messaging, social notifications, and events

- Eight core CPUs
- 32GB of RAM

1. ~~RabbitMQ on Compute Engine~~
2. Pub/Sub

- RabbitMQ will not be easy to scale with a managed instance group
- Pub/Sub is a fully managed queueing service, this is an optimal solution
  - Excellent future integrations
  - No scaling issues

Putting it together

Existing environment

MySQL. One server for user data, inventory, static data
MySQL 5.7
8 core CPUs
128 GB of RAM
2x 5 TB HDD (RAID 1)

* One row of a much larger spreadsheet

Technical requirements

- Easily create non-production environments in the cloud
- Implement an automation framework for provisioning resources in cloud
- Implement a continuous deployment process for deploying applications to the on-premises data center 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

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
- Reduce TCO

Proposed product/ solution

- ~~Compute Engine~~
  - ~~Custom instance~~
  - ~~HDD -> Persistent Disk~~

---

or

- Cloud SQL
  - Custom instance
  - HDD -> Persistent Disk

---

or

- Cloud Spanner

- Static data -> Cloud Storage

Moving to managed services

Existing environment

MySQL. One server for user data, inventory, static data
MySQL 5.7
8 core CPUs
128 GB of RAM
2x 5 TB HDD (RAID 1)

Proposed product/ solution

- ~~Compute Engine~~
  - ~~Custom instance~~
  - ~~HDD -> Persistent Disk~~

—————————————

or

—————————————

- Cloud SQL
  - Custom instance
  - HDD -> Persistent Disk

—————————————

or

—————————————

- Cloud Spanner

—————————————

- Static data -> Cloud Storage

- In the previous slide, MySQL, a relational database being moved to the cloud was discussed
- Cloud Spanner *could* be a good option, but would require code changes.
- This is a case study; you can't talk to the application developers or DBAs.
- If there is a good managed service option, make sure you understand it.

Refining the Components

At this stage, you may still have multiple potential solutions.

- Read about the capabilities of each
- Identify their strengths and weaknesses
- Read the best practices!
- Ensure you have considered the aspects outlined in the Google Cloud Architecture Framework:
  - System design
  - Operational excellence
  - Security, privacy, and compliance
  - Reliability
  - Cost optimization
  - Performance optimization

Know the Best Practices

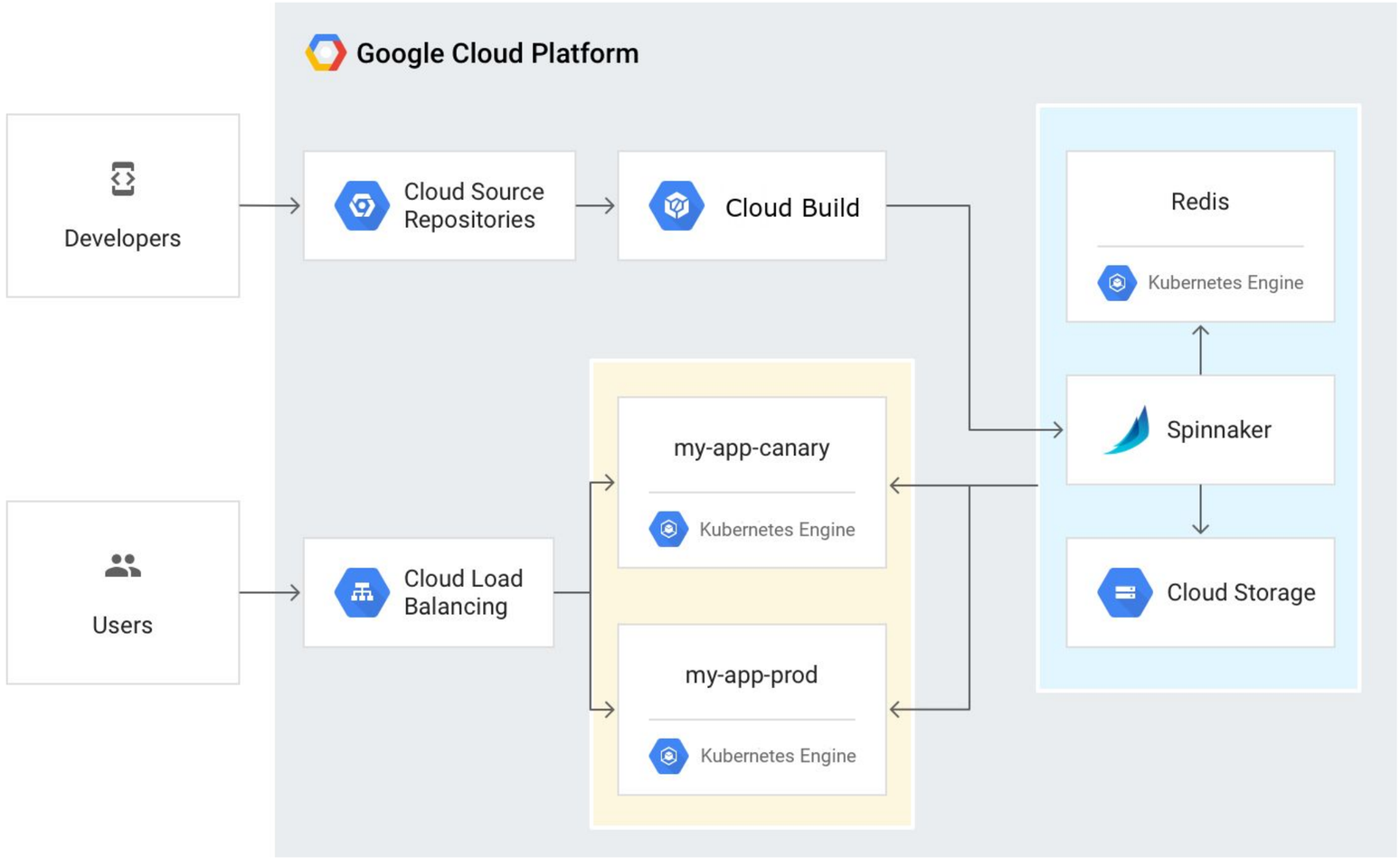
- For the products you propose, be familiar with product characteristics and best practices.
- Always advocate for the best ways of doing things.

Example:

- Dress4Win wants to “Improve business agility and speed of innovation through rapid provisioning of new resources”
- Learn more about CI/CD products
  CI/CD with Google Cloud

Reference architectures

[Cloud Reference Architectures and Diagrams | Cloud Architecture Center]



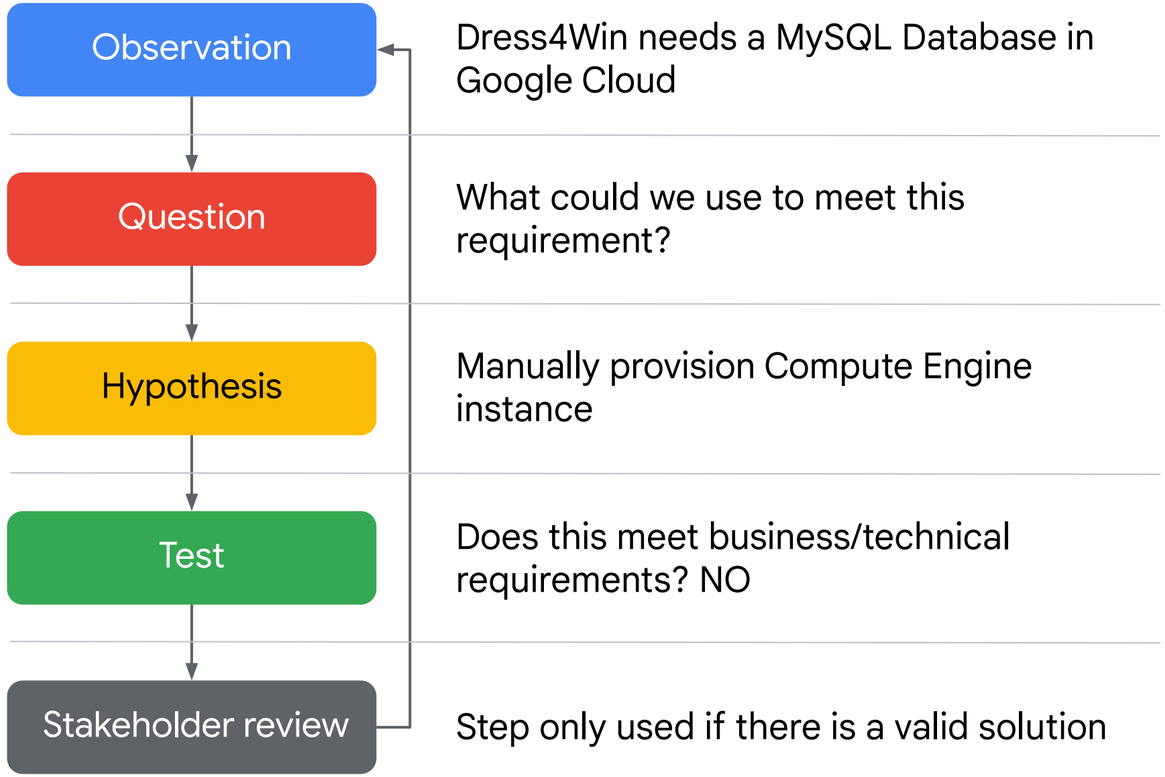
Interrogate your design

Questions:

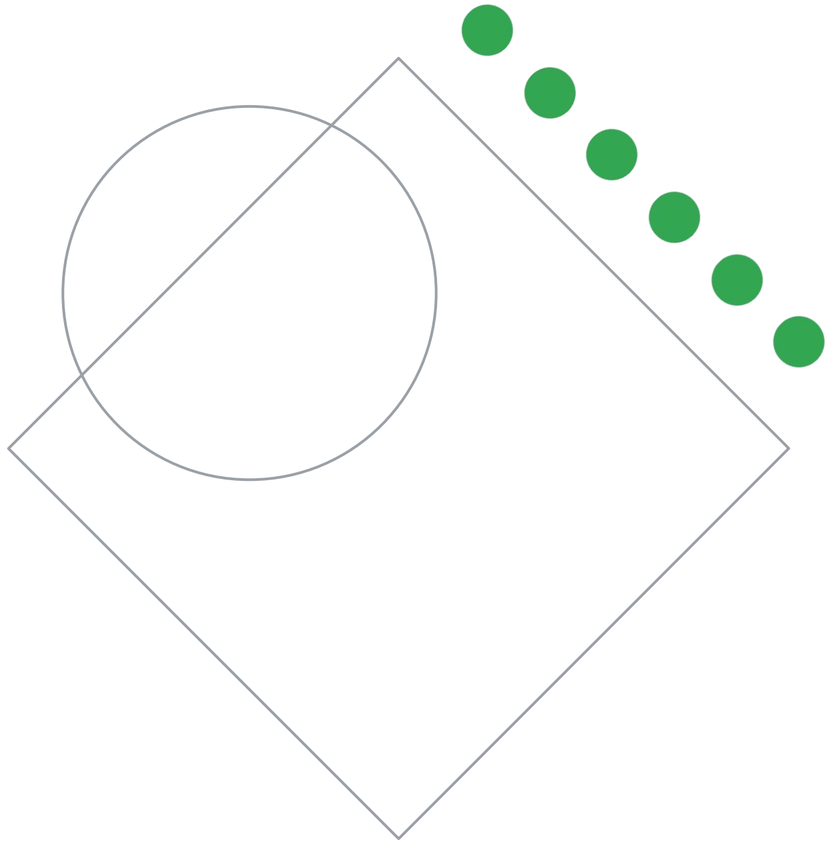
- Will this compute/storage/network design enable you to refactor your design over time?
- How well would this scale if you got 10x or 100x the traffic you expected?
- Are there big data products or services you could use now and grow into?
- Does your VPC network need to be accessed from somewhere else? By who?
- Could you implement your solution as a fully managed pipeline?
- How will your service be accessed from the internet?
- What if any/compliance requirements exist?
- What is a likely disaster? Would your environment survive?
- How do you know your service is healthy? How do you troubleshoot and fix it if it’s not?
- How do you deploy new versions of your service or roll them back?

Identify final solution, diagram, and iterate

- Diagram your solution
- Get feedback
- Iterate



Weekly study goals



Plan time to prepare

When will you take the exam?

How many weeks do you have to prepare?

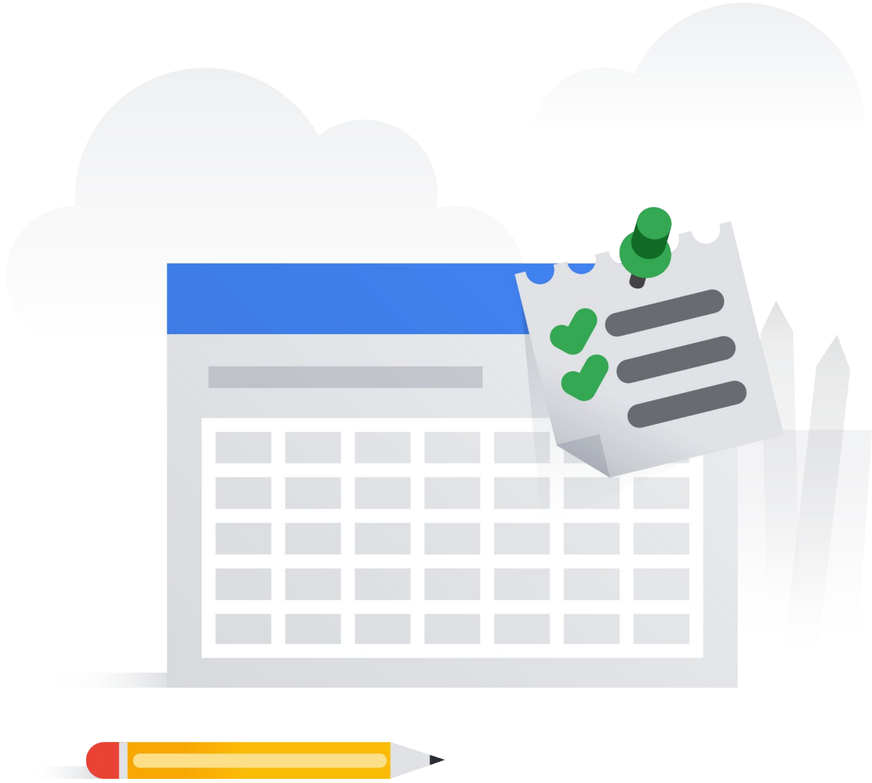
How many hours will you spend preparing for the exam each week?

How many total hours will you prepare?

Create a weekly study plan

Consider:

- What exam guide section(s) or topic area(s) will you focus on?
- What courses (or specific modules) will help you learn more?
- What Skill Badges or labs will you work on for hands-on practice?
- What documentation links will you review?
- What additional resources will you use - such as sample questions?
- How will you prepare for the case studies?



Weekly study template (example)

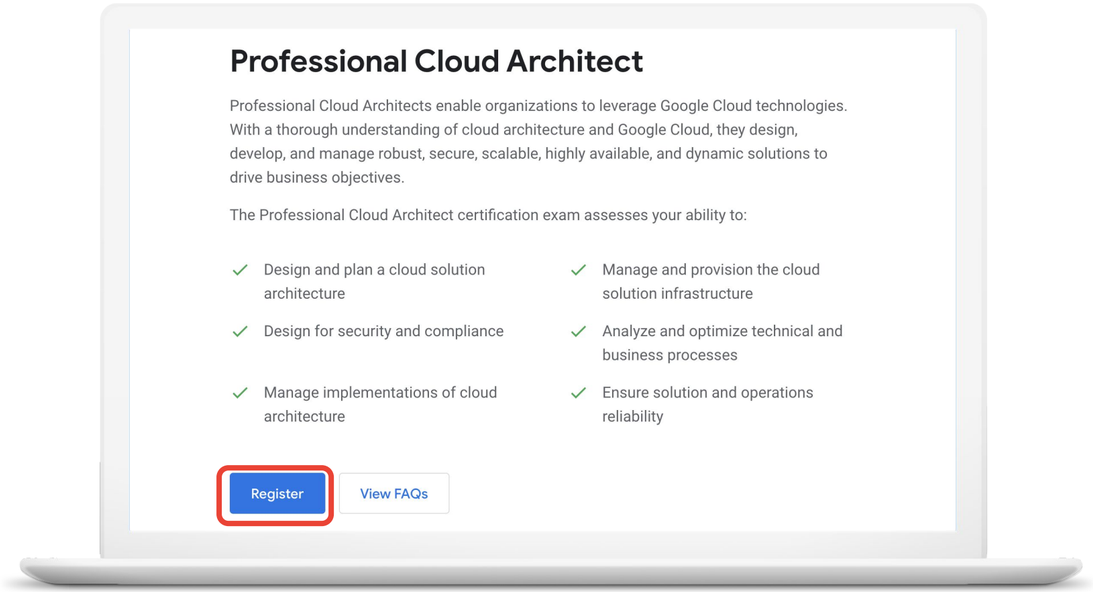
Area(s) of focus:	Automating infrastructure with Terraform
Courses/modules to complete:	Elastic Google Cloud Infrastructure: Scaling and Automation M3 Reliable Google Cloud Infrastructure: Design and Process, M3
Skill Badges/labs to complete:	Automating Infrastructure on Google Cloud with Terraform
Documentation to review:	Using Recommendations for Infrastructure as Code | Recommender Documentation | Google Cloud Using Terraform with Google Cloud Managing infrastructure as code with Terraform, Cloud Build, and GitOps | Cloud Architecture Center | Google Cloud
Additional study:	Sample questions 1-3 Review case study 2 and search for relevant reference architectures

Weekly study template

Area(s) of focus:	
Courses/modules to complete:	
Skill Badges/labs to complete:	
Documentation to review:	
Additional study:	

Registering for the Professional Cloud Architect exam

1. Go to the certification information site
   https://cloud.google.com/certification/cloud-architect
2. Click the link to register for the exam



3. Create or log into a Webassessor account
4. Choose “Register for an Exam”
5. Choose either a remote or an onsite proctoring option
   (If you chose onsite proctoring, you will then need to select a testing location)
6. Schedule a testing date and time
7. Pay for your exam using an exam voucher or a credit card

Feedback

We value your feedback on this course and ask that you take a few minutes to fill out the survey for this course. You will find the link in your classroom, and can ask your instructor if you have any questions.

Q & A

Thank you.

Google Cloud