Google Cloud Platform

Google Compute Engine and Networking

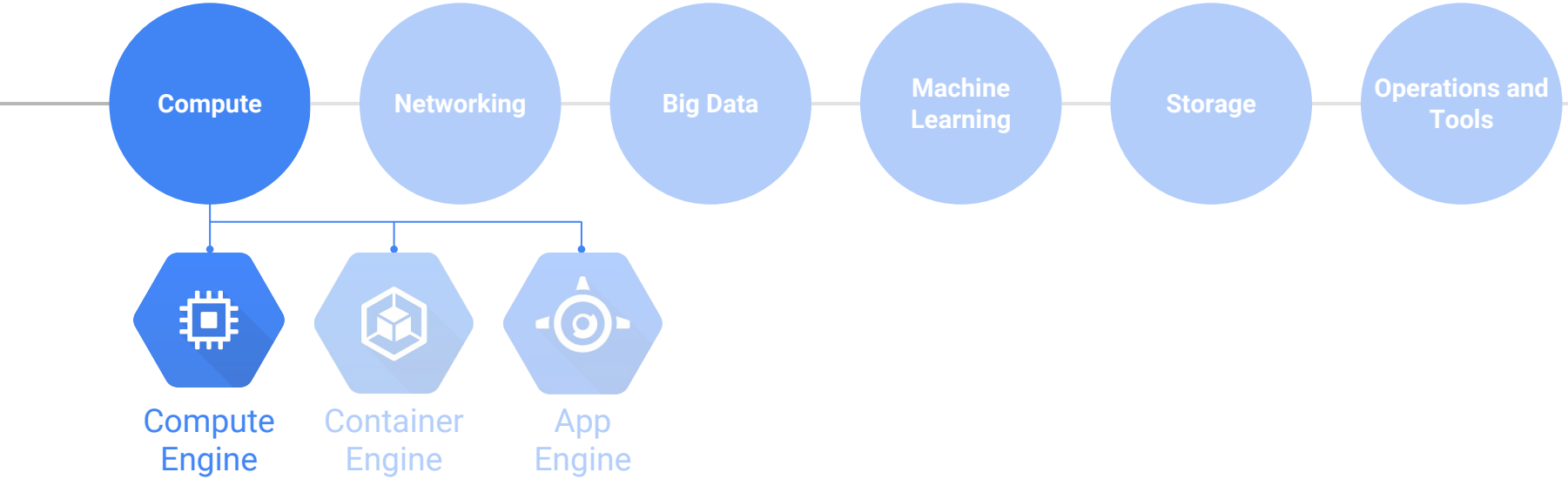
Google Cloud Platform Fundamentals

V2.0

Agenda

1. Google Compute Engine Overview
2. Google Cloud Networking
3. Operations and Tools
4. Quiz & Lab

Google Cloud Platform



Google Compute Engine (1 of 3)

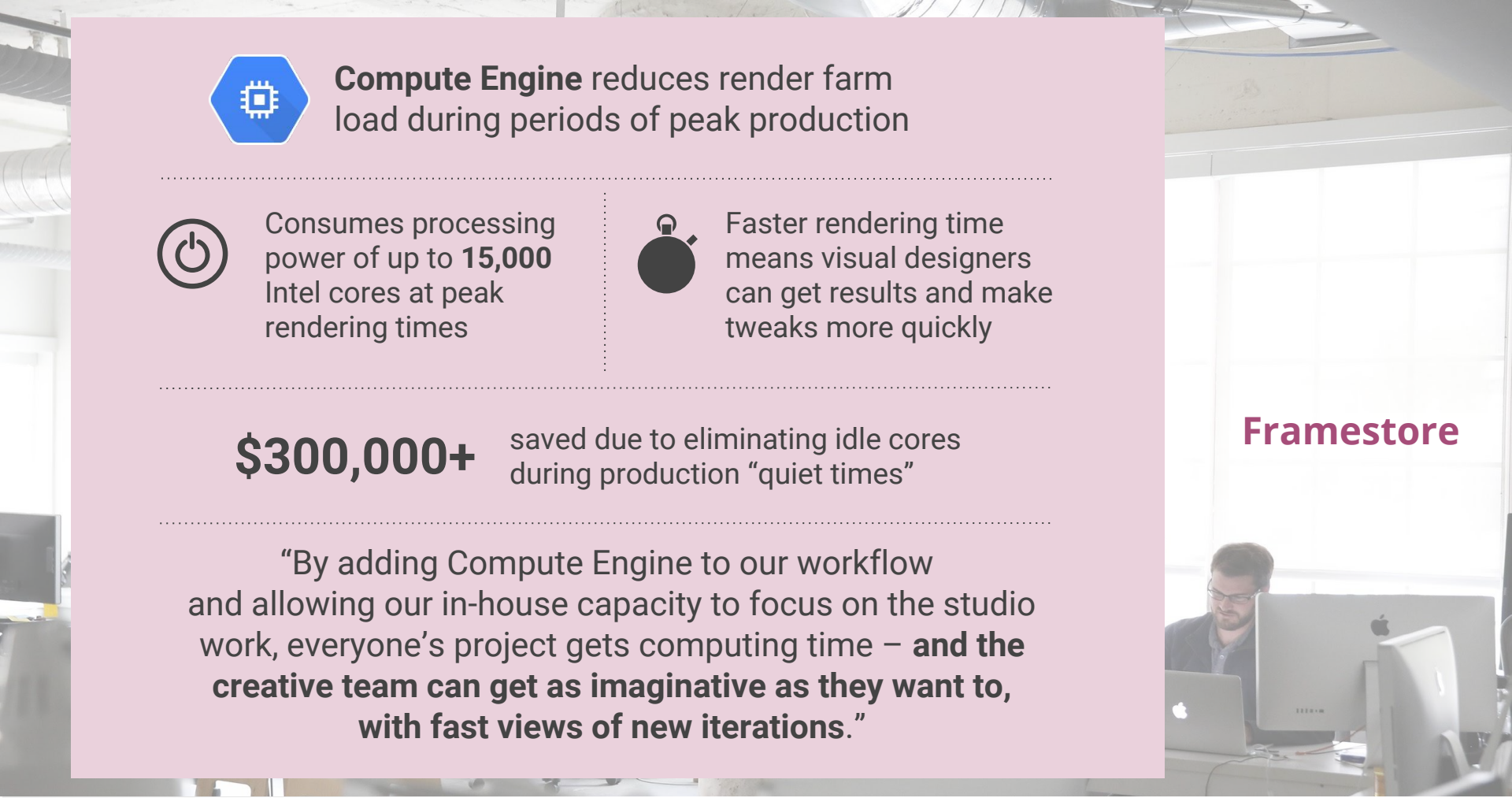
- Run large-scale workloads on virtual machines hosted on Google's infrastructure
- Robust networking features
  - Default, custom networks
  - Firewall rules
  - Regional HTTP(s) load balancing
  - Network load balancing
  - Subnetworks

Google Compute Engine (2 of 3)

- High CPU, high memory, standard and shared-core machine types
- Persistent disks
  - Standard, SSD, local SSD
  - Snapshots
- Resize disks, migrate instances with no downtime
- Instance metadata and startup scripts

Google Compute Engine (3 of 3)

- Advanced APIs for auto-scaling and instance group management
- Innovative pricing
  - **Per-minute** billing, sustained use discounts
  - Preemptible instances
  - High throughput to storage at no extra cost
  - Custom machine types - Only pay for the hardware you need



Compute Engine reduces render farm load during periods of peak production

Consumes processing power of up to **15,000** Intel cores at peak rendering times

Faster rendering time means visual designers can get results and make tweaks more quickly

$300,000+ saved due to eliminating idle cores during production “quiet times”

“By adding Compute Engine to our workflow and allowing our in-house capacity to focus on the studio work, everyone’s project gets computing time – **and the creative team can get as imaginative as they want to, with fast views of new iterations**.”

Framestore

Comparing Compute Options

	Compute Engine	Container Engine	App Engine Standard	App Engine Flexible
Language support	Any	Any	Java, Python, Go & PHP	Any
Service model	IaaS	Hybrid	PaaS	PaaS
Primary use case	General computing workloads	Container-based workloads	Web and mobile applications	Web and mobile applications, container-based workloads

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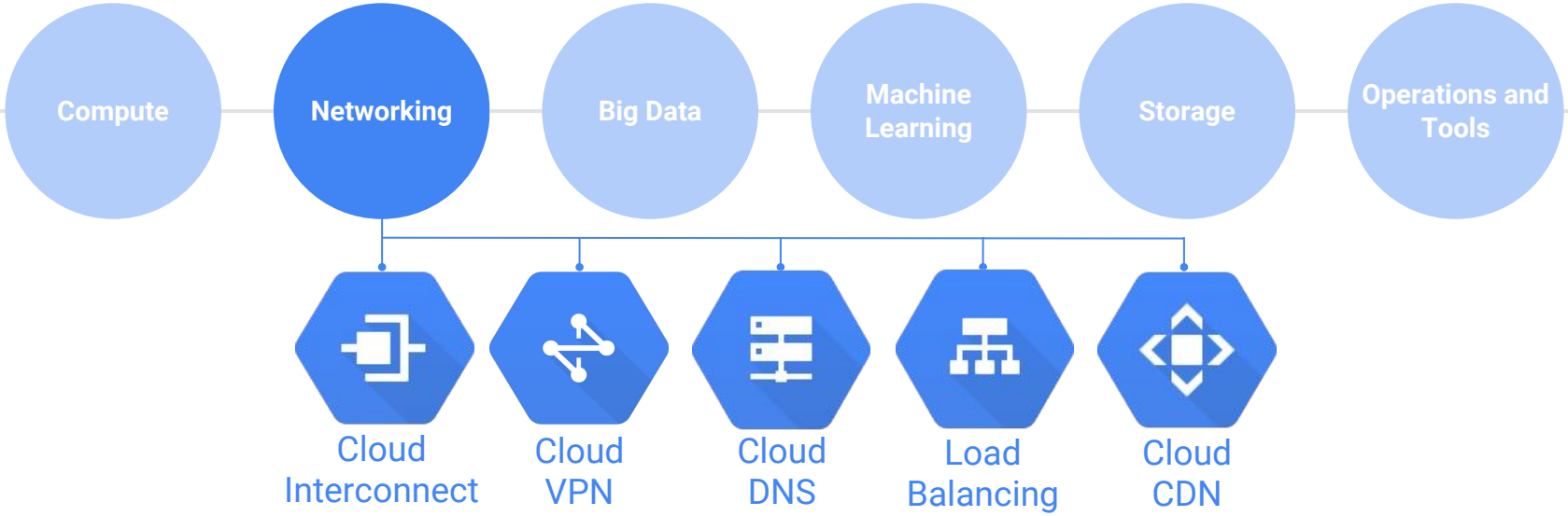

Google Cloud Interconnect

Carrier Interconnect	*Direct Peering*	*CDN Interconnect*
Enterprise-grade connections provided by carrier service providers	Connect your business directly to Google	Allows select CDN providers to establish direct interconnect links with Google's edge network at various locations

Google Cloud Interconnect

Google Cloud VPN

- Securely connect your network to Google Cloud Platform using IPsec VPN connection
  - Encrypts traffic over the Internet
- *Google Cloud Router* supports dynamic routing between Google Cloud Platform and your network

Google Cloud DNS

- Highly available and scalable DNS
  - Translates domain names into IP addresses
- Create managed zones, then add, edit, delete DNS records
  - Programmatically manage zones and records using RESTful API or command-line interface

Google Cloud Load Balancing (1 of 2)

- HTTP(s) load balancing
  - Balance HTTP-based traffic across multiple Compute Engine regions
  - Global, external IP address routes traffic
  - Scalable, requires no pre-warming and provides resilience, fault tolerance

Google Cloud Load Balancing (2 of 2)

- TCP/SSL and UDP (network) load balancing
  - Spread TCP/SSL and UDP traffic over pool of instances within a Compute Engine region
  - Ensures only healthy instances handle traffic
  - Scalable, requires no pre-warming

Google Cloud CDN (Content Delivery Network)

- Use Google's globally distributed edge caches to cache HTTP(S) load balanced content far closer to your users than your instances
  - Faster delivery of content to users while reducing costs
- Cloud CDN uses caches at network locations to store responses generated by instances

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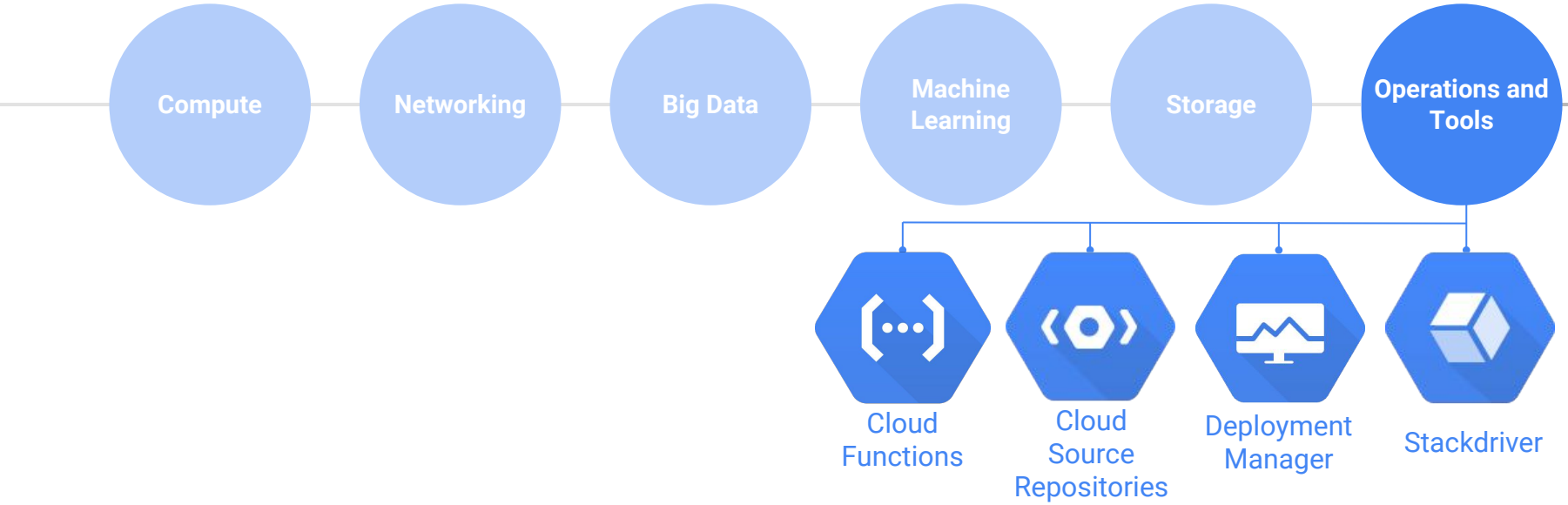

Google Stackdriver Beta (1 of 2)

- Integrated monitoring, logging, diagnostics
- Works across Google Cloud Platform, Amazon Web Services
- Open source agents, integration
- Powerful data, analytics tools
- Collaborations with PagerDuty, BMC, Splunk, others

Google Stackdriver Beta (2 of 2)

Monitoring

Platform, system, and application metrics
Uptime/health checks
Dashboards and alerts

Logging

Platform, system, and application logs
Log search/view/filter
Log-based metrics

Trace

Latency reporting and sampling
Per-URL latency and statistics

Error Reporting

Error notifications
Error dashboard

Debugger

Debug applications

Google Cloud Deployment Manager

- Infrastructure management service
- Create a `.yaml` template describing your environment and use Deployment Manager to create resources
- Provides repeatable deployments

Google Cloud Source Repositories Beta

- Fully-featured Git repositories hosted on Google Cloud Platform
- Supports collaborative development of cloud apps
- Includes:
  - Source code editor
  - Integration with Stackdriver debugger

Google Cloud Functions Alpha

- Create single-purpose functions that respond to events without a server or runtime
  - Event examples: New instance created, file added to Cloud Storage
- Written in Javascript, execute in managed Node.js environment on Google Cloud Platform

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Quiz

1. Name 3 robust networking services available to your applications on Google Cloud Platform.
2. Name 3 Compute Engine pricing innovations.
3. *True or False*: Google Cloud Load Balancing allows you to Balance HTTP-based traffic across multiple Compute Engine *regions*.

Quiz Answers

1. Name 3 robust networking services available to your applications on Google Cloud Platform.

   Answer: Firewall rules, subnetworks, HTTP(s) and network load balancing.

2. Name 3 Compute Engine pricing innovations.

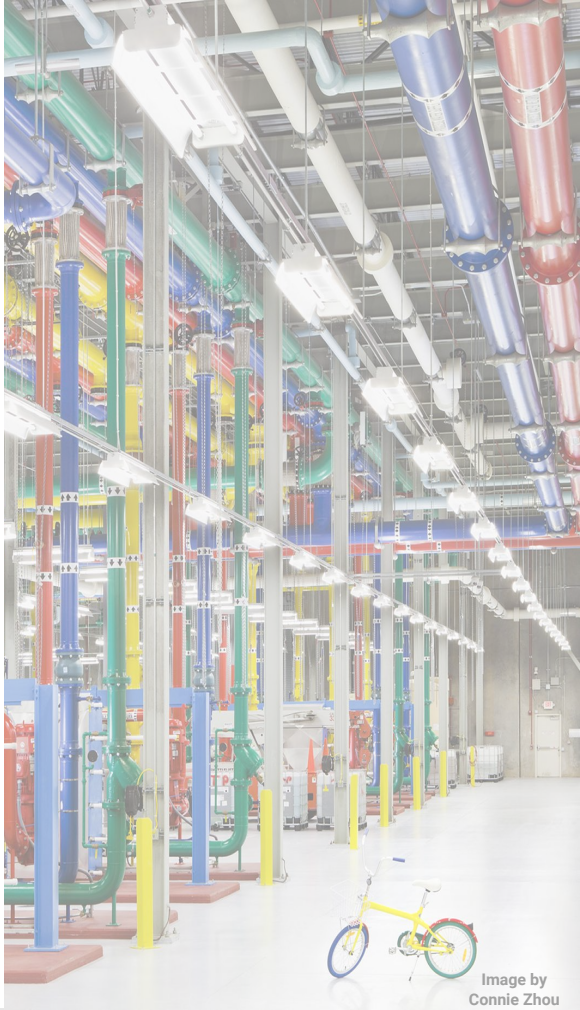
   Answer: Per-minute billing, custom machine types, preemptible instances.

3. *True*: Google Cloud Load Balancing allows you to Balance HTTP-based traffic across multiple Compute Engine *regions*.

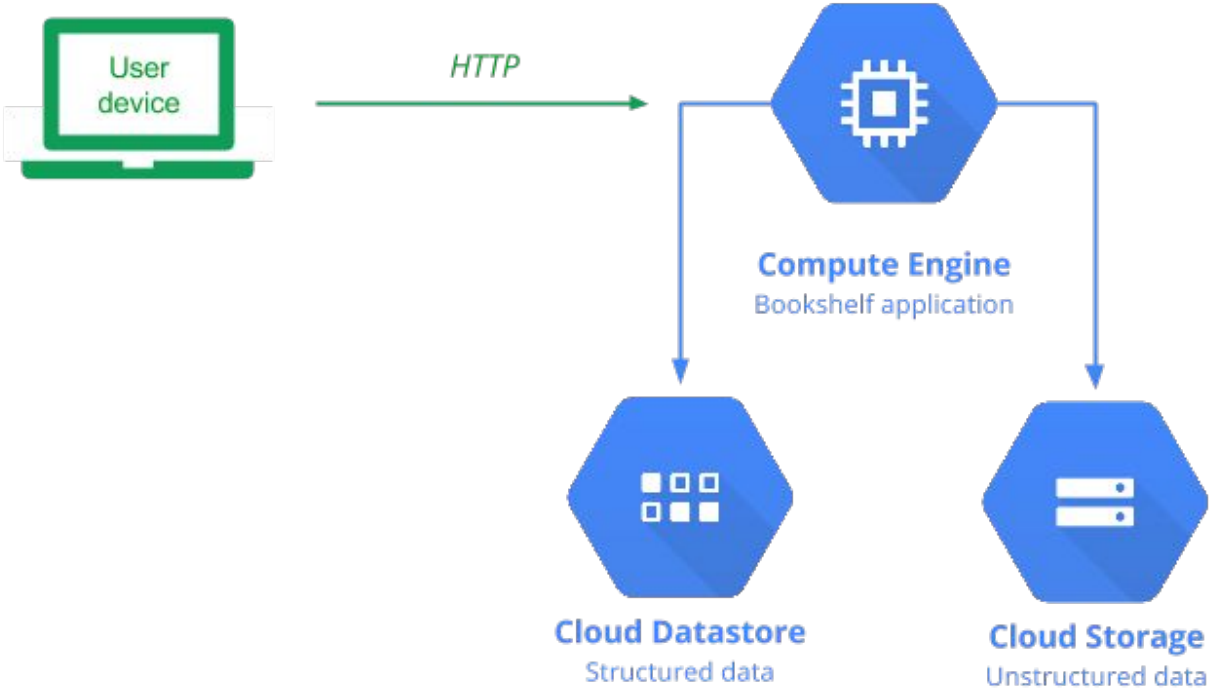
Lab (1 of 2)

Deploy the Bookshelf application to Compute Engine.

1. Create a Google Compute Engine instance
2. Deploy the Bookshelf application using a startup script
3. Add a firewall rule to allow HTTP traffic
4. Test the Bookshelf application in your browser



Lab (2 of 2)



Resources

- Google Compute Engine
  https://cloud.google.com/compute/docs/
- Google Cloud CDN
  https://cloud.google.com/cdn/docs/
- Google Cloud Stackdriver
  https://cloud.google.com/stackdriver/docs/
- Google Cloud Deployment Manager
  https://cloud.google.com/deployment-manager/docs/
- Google Cloud Source Repositories
  https://cloud.google.com/source-repositories/docs/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