Migrating to GCP

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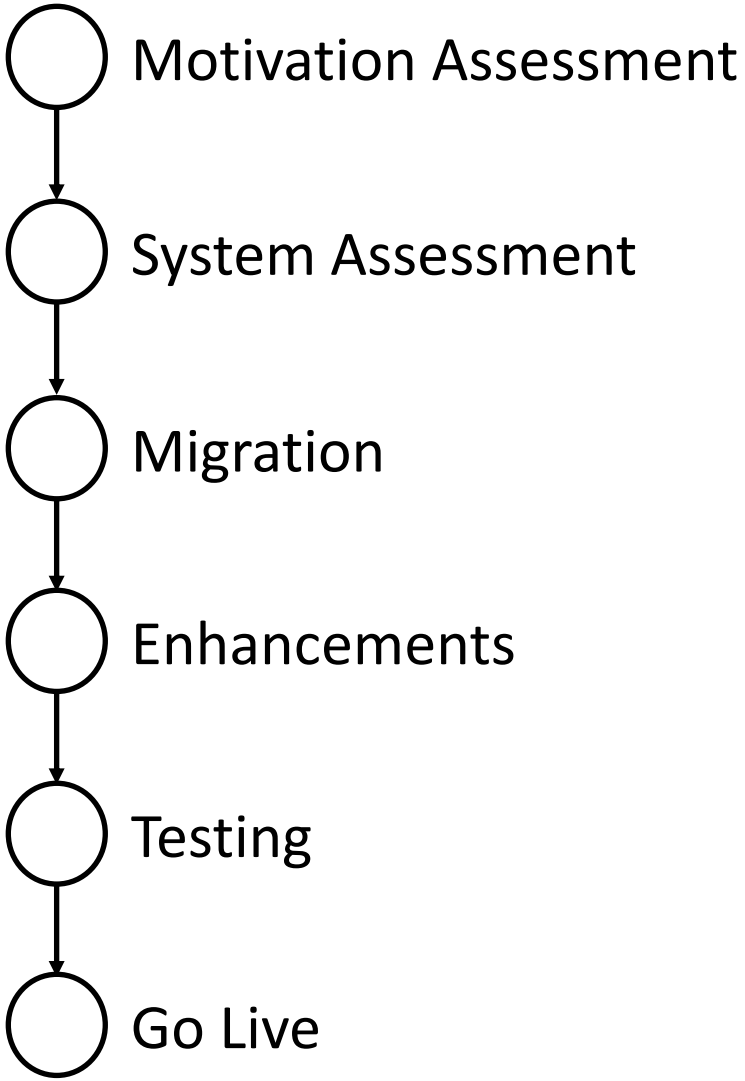
Migrating to GCP

- Many organizations want to migrate their apps to the cloud
- Various motivations
- Has to be planned ahead, and done methodically
- Rushing to the cloud could end up badly
- There's a well defined process that should be followed in order for the migration to complete successfully

The Migration Process



Motivation Assessment

- Answer the grand question:

Why?

(do we want to migrate to the cloud)

Possible Answers

- To save costs
- To take advantage of cloud capabilities (services, redundancy, scalability, etc)
- To modernize the system
- To attract new employees

Saving Costs

- Not always the case
- Sometimes cloud system can cost MORE than on-premises system
- CapEx vs OpEx
- A very thorough cost estimation should be conducted

Take Advantage of Cloud Capabilities

- Great motivation! (probably the best…)
- Make sure the migrated system can actually use cloud capabilities
- Example: Legacy, single-session app that cannot be scaled will end up on a single VM, just like on-prem

Modernize the System

- Usually, Modernization = Rewrite
- Why?
- Possible answers:
  - Not supported platforms
  - Difficult to hire employees
  - Licensing costs

Attract New Employees

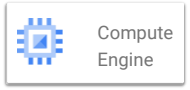
- Not a very good motivation, but it works…
- The organization has to be part of the cloud trend in order to attract new employees

Migration Strategies

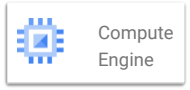
Lift & Shift	Install the app in the cloud “as-is”, without any changes, usually on a VM
Refactoring	Modify the app a bit so it can run on managed services (ie. App Engine, Cloud Run)
Rewrite	Rewrite the app from scratch, usually in a modern platform, and take advantage of all cloud services

Lift & Shift

On-Premise



VM
Java App

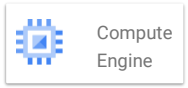


VM
Oracle DB

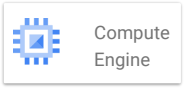
Cloud

Refactor

On-Premise

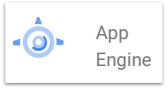


VM
nodeJS App

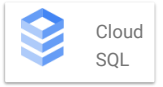


VM
MySQL DB

Cloud



App Engine
nodeJS App



Cloud SQL

Rewrite

On-Premise

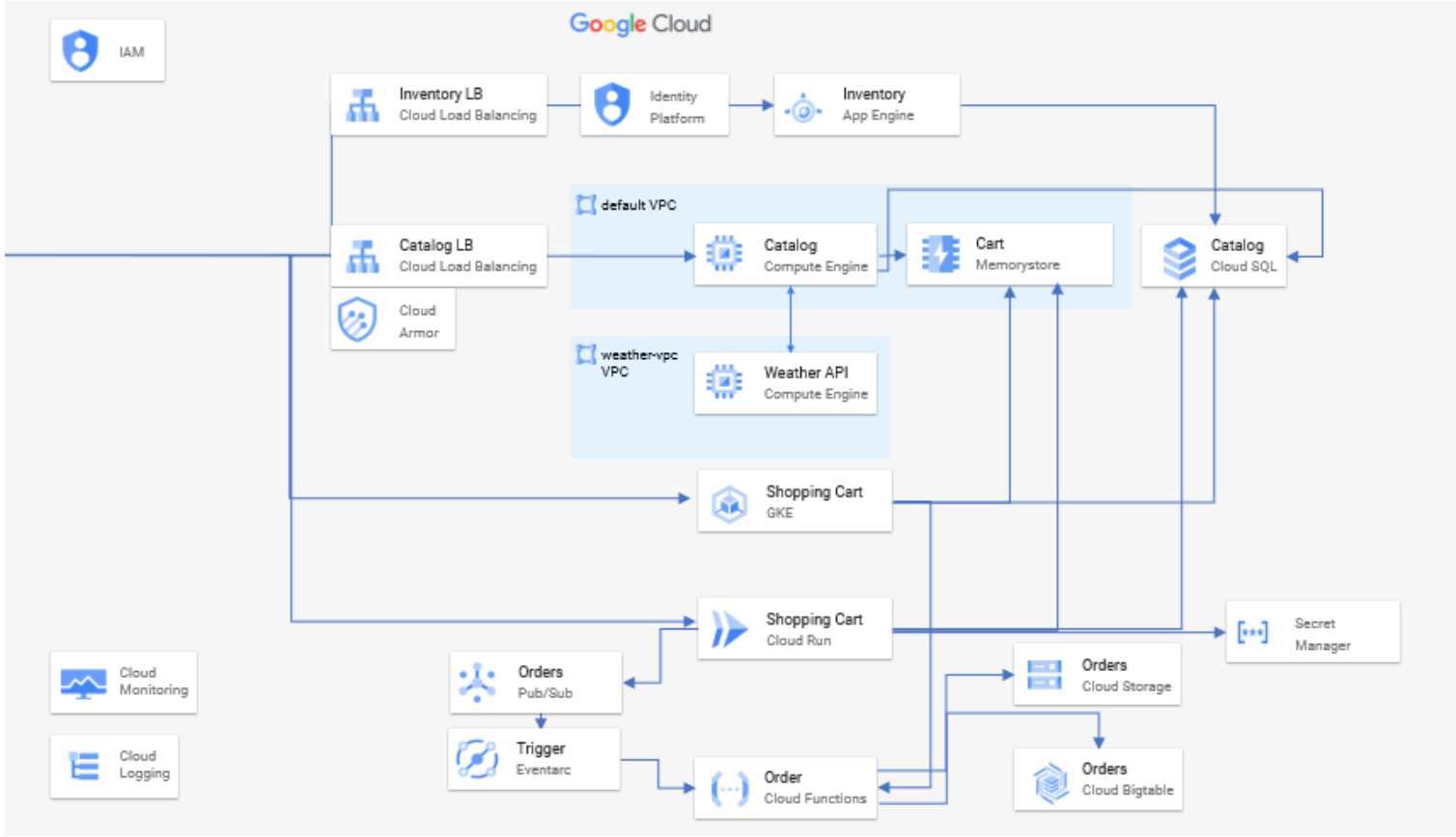
Compute Engine

VM
C++ App

Compute Engine

VM
File Storage

Cloud



Comparing Cloud Migration Strategies

System Assessment

- Goal:
  - To find out what is the best way to migrate the system to the cloud
  - Doing this by asking the right questions

System Assessment

- Questions we need to ask:

What is the runtime platform of the system and on which OS? (.NET, Java, C++ etc.)

What is the authentication mechanism?

How is it deployed today? (VM, Docker…)

Any interfaces to organizational systems?

What database(s) is used?

Any work with hardware? (dongles…)

System Assessment

- Answers dictate migration strategy, if possible at all:

What is the runtime platform of the system and on which OS? (.NET, Java, C++ etc.)

What is the authentication mechanism?

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System Assessment

- Answers dictate migration strategy, if possible at all:

What is the runtime platform of the system and on which OS? (.NET, Java, C++ etc.)

What is the authentication mechanism?

How is it deployed today? (VM, Docker…)

If yes, perhaps containerization is not an option

Any interfaces to organizational systems?

What database(s) is used?

Any work with hardware? (dongles…)

System Assessment

- Answers dictate migration strategy, if possible at all:

What is the runtime platform of the system and on which OS? (.NET, Java, C++ etc.)

What is the authentication mechanism?

How is it deployed today? (VM, Docker…)

Any interfaces to organizational systems?

What database(s) is used?

Any work with hardware? (dongles…)

Migration

- Time for actual migration…
- Migration strategy depends on the system assessment results

Lift & Shift

- The easiest strategy
- Simply create VM images and build new VMs in the cloud
- Don't forget to put VMs in appropriate VPC and define Firewall Rules

Refactor

- Should be done in two phases:
  - Lift & Shift – Make sure the app works in the cloud as-is
  - Refactor – gradually improve the system and integrate cloud services
- Don’t try shortcuts!

Rewrite

- Not really a migration…
- Design the system from the ground up to be cloud native
- Use as many cloud services as possible

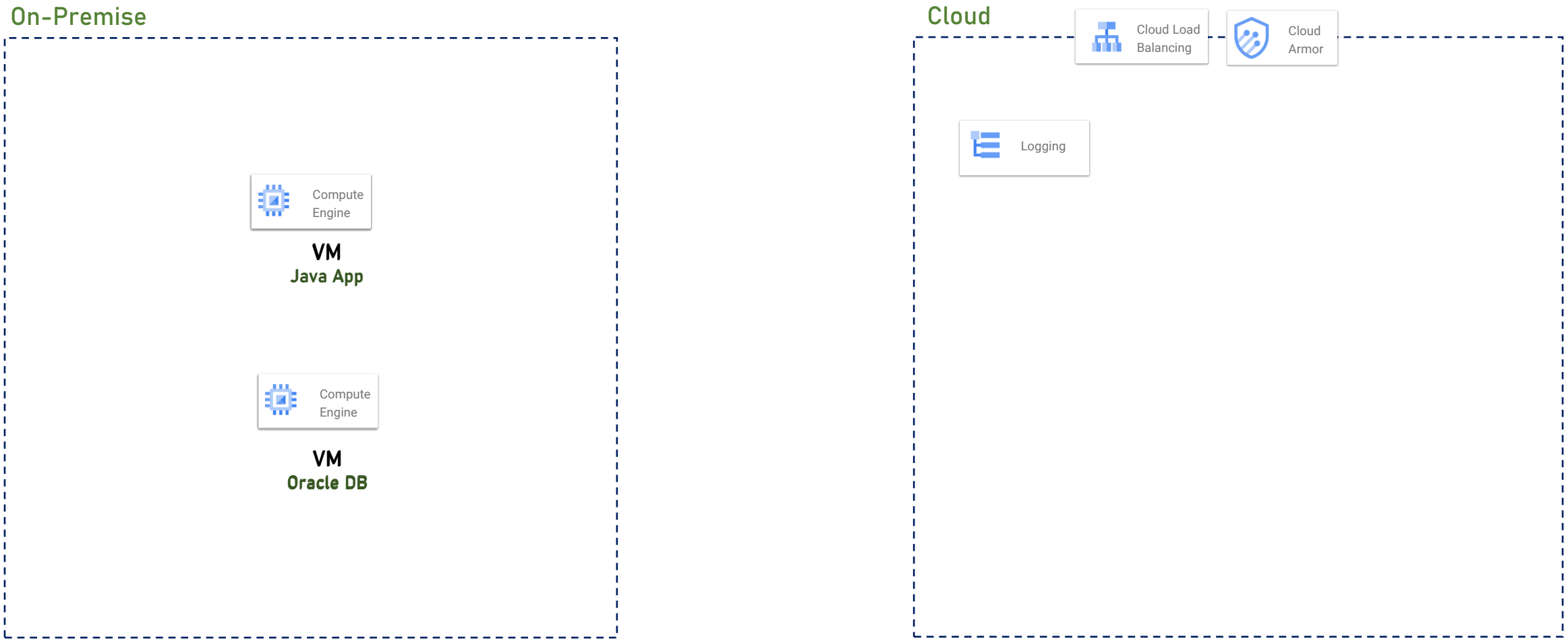
DB Migration

- In general:
  - Prefer the managed version of the DB (and not on a VM)
  - Migration is better done using the DB's own tools and not via cloud migration services

App Enhancements

- After migration, enhance the system
- Not necessarily requires code changes
- Main areas for improvements:
  - Logging and Monitoring using Cloud Logging
  - Network protection using Load Balancer and Cloud Armor

Lift & Shift Example



Testing

- Testing in cloud is similar to on-prem
- Put strong emphasis on logging and monitoring
- Make sure you have access to system's data
- If system is auto-scaled or DRed – test these scenarios
- Check performance – might vary from the on-prem figures

Go Live

- Congratulations!
- Keep an eye on the costs
  - Set up budget alerts
  - Define tags
  - Look at the data at least once a month