Getting Started With Google App Engine

App Engine

- **Simplest way** to deploy and scale your applications in GCP.
  - Provides end-to-end application management.
  - **Supports**:
  - Go, Java, .NET, Node.js, PHP, Python, Ruby using pre-configured runtimes.
  - Use custom run-time and write code in any language.
  - Connect to variety of Google Cloud storage products (Cloud SQL etc).
  - **No usage charges** - Pay for resources provisioned.
  - **Features**:
  - Automatic load balancing & Auto scaling.
  - Managed platform updates & Application health monitoring.
  - Application versioning.
  - Traffic splitting.

Compute Engine vs App Engine

* **Compute Engine**
  - IAAS

- MORE Flexibility
- MORE Responsibility
- Choosing Image.
- Installing Software Choosing Hardware.
- Fine grained Access / Permissions (Certificates / Firewalls).
- Avaiabilit y e t c.
- **App Engine**.
- PaaS
- Serverless
- LESSER Responsibility.
- LOWER Flexibility.

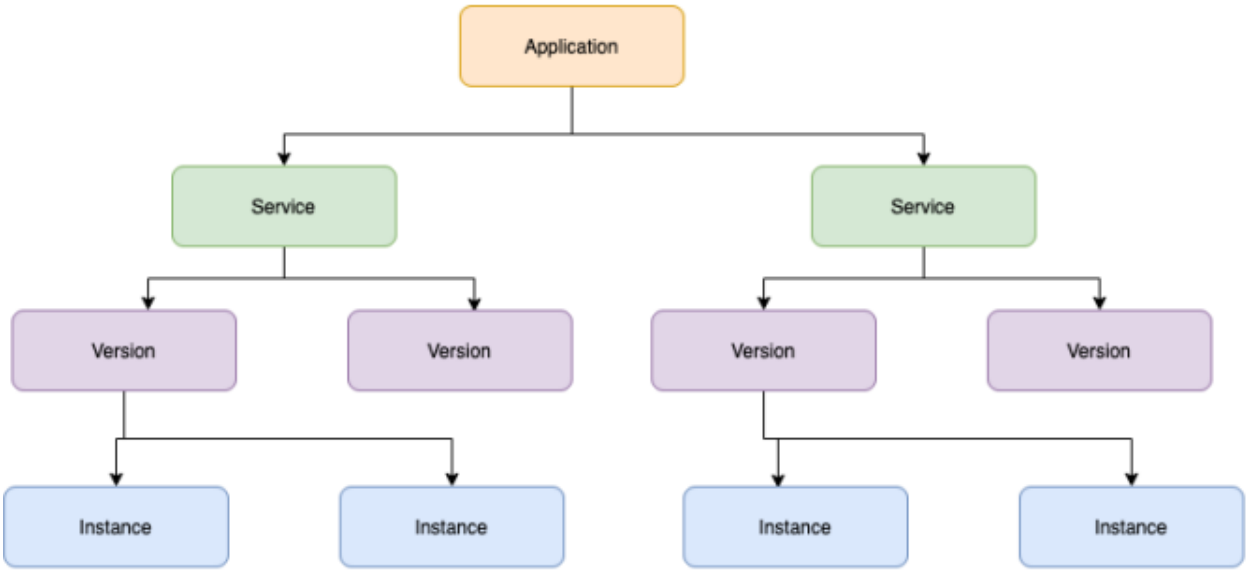
App Engine environments

* **Standard**: Applications run in language specific sandboxes.

- Complete isolation from OS/Disk/Other Apps.
- **V1**: Java, Python, PHP, Go (OLD Versions).
- ONLY for Python and PHP runtimes:
- Restricted network Access.
- Only white-listed extensions and libraries are allowed.
- No Restrictions for Java and Go runtimes.
- **V2**: Java, Python, PHP, Node.js, Ruby, Go (NEWER Versions).

- Full Network Access and No restrictions on Language Extensions.
- **Flexible** - Application instances run within Docker containers.
- Makes use of Compute Engine virtual machines.
- Support ANY runtime (with built-in support for Python, Java, Node.js, Go, Ruby, PHP, or .NET).
- Provides access to background processes and local disks.

App Engine - Application Component Hierarchy



Application: One App per Project.

Service(s): Multiple Microservices or App components.

- You can have multiple services in a single application.
  - Each **Service** can have different settings.
    - Earlier called Modules.
- **Version(s):** Each version associated with code and configuration.
  - Each **Version** can run in one or more instances.
    - Multiple versions can co-exist.
  - Options to rollback and split traffic.

Commands executed in next steps

1. cd default-service
2. gcloud app deploy
3. gcloud app services list
4. gcloud app versions list
5. gcloud app instances list
6. gcloud app deploy --version=v2
7. gcloud app versions list
8. gcloud app browse
9. gcloud app browse --version 20210215t072907
10. gcloud app deploy --version=v3 --no-promote
11. gcloud app browse --version v3
12. gcloud app services set-traffic split=v3=.5,v2=.5
13. gcloud app services set-traffic splits=v3=.5,v2=.5

14. watch curl https://melodic-furnace-304906.uc.r.appspot.com/
15. gcloud app services set-traffic --splits=v3=.5,v2=.5 --split-by=random
16. cd ../my-first-service/
17. gcloud app deploy
18. gcloud app browse --service=my-first-service
19.
20. gcloud app services list
21. gcloud app regions list
22.
23. gcloud app browse --service=my-first-service --version=20210215t075851
24. gcloud app browse --version=v2
25. gcloud app open-console --version=v2
26. gcloud app versions list --hide-no-traffic

App Engine - Scaling Instances

* **Automatic** - Automatically scale instances based on the load:

- Recommended for Continuously Running Workloads.
- Auto scale based on:
- **Target CPU Utilization** - Configure a CPU usage threshold.
- **Target Throughput Utilization** - Configure a throughput threshold.

- **Max Concurrent Requests** - Configure max concurrent requests an instance can receive.
    - Configure **Max Instances** and **Min Instances**.
- **Basic** - Instances are created as and when requests are received:
    - Recommended for Adhoc Workloads.
    - Instances are shutdown if ZERO requests.
        - Tries to keep costs low.
        - High latency is possible.
- NOT supported by App Engine Flexible Environment.
    - Configure Max Instances and Idle Timeout.
- **Manual** - Configure specific number of instances to run:
    - Adjust number of instances manually over time.

AppEngine Demo

- Deploy an application to cloud using App Engine.
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