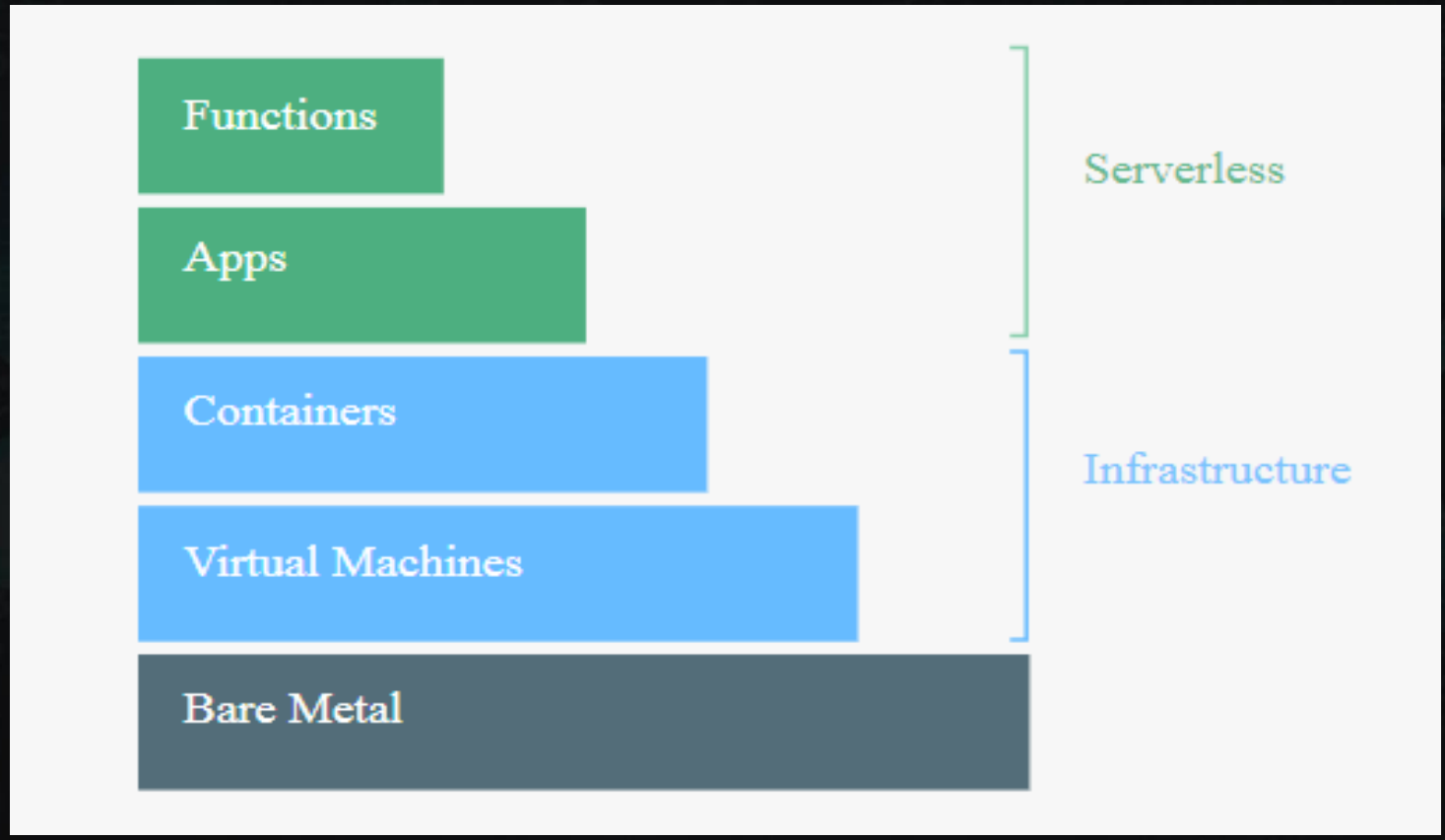
GCP Compute Service

Cloud App Engine

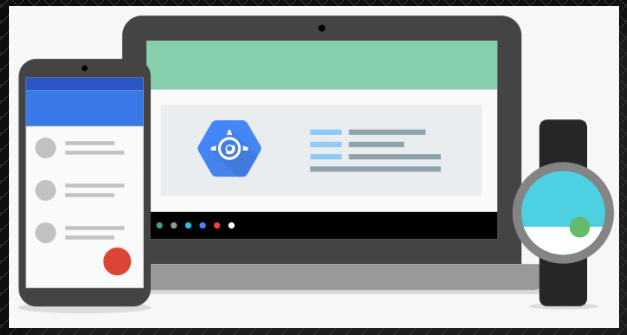
Scalable Backend for Web applications and Mobile & IoT
Platform as a service (PAAS)

Google Cloud Platform

GAE – E2E Compute – Serverless env.



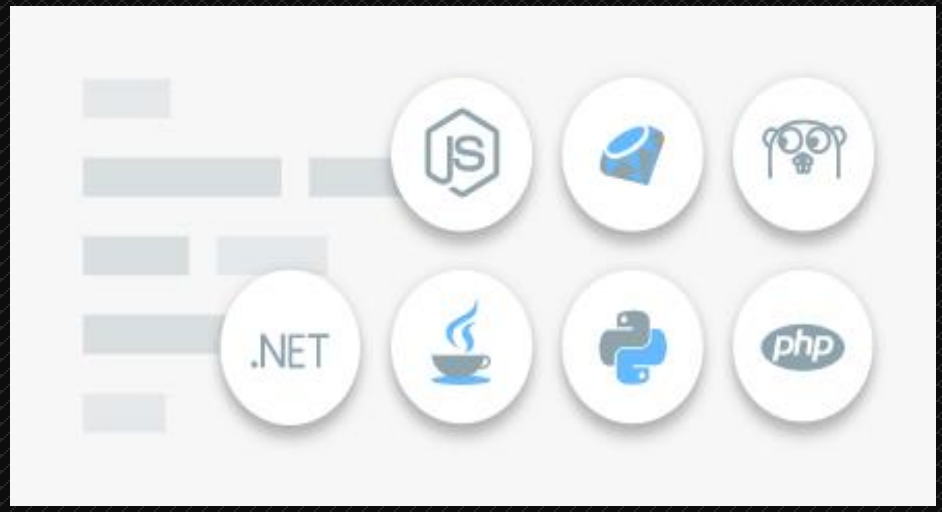
GAE – App Engine for All



Google App Engine is Infinite Scalable fully managed platform that completely abstracts away infrastructure so you focus only on code.

Build modern web and mobile applications on an open cloud platform: bring your own language runtimes, frameworks, and third party libraries.

GAE – Multiple Languages



Out of the box, App Engine supports Node.js, Java, Ruby, C#, Go, Python, and PHP. Developers from these language communities can be productive immediately in a familiar environment: just add code.

GAE: Features

GAE

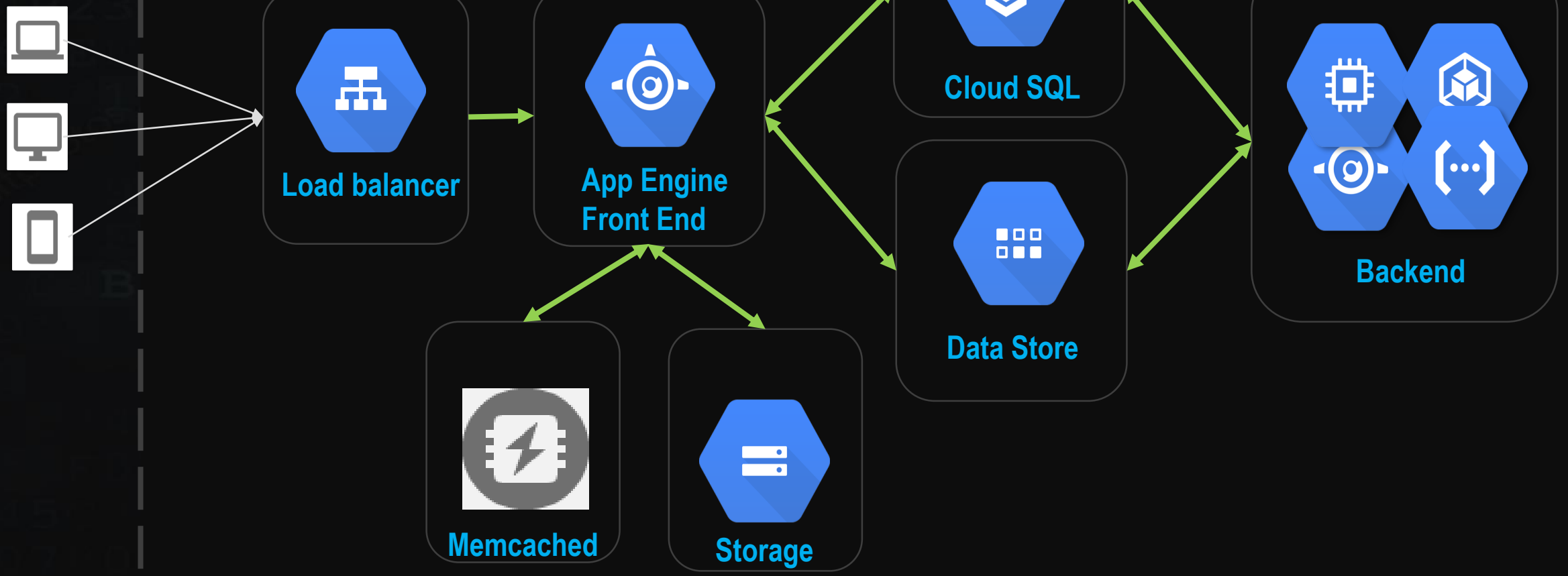
- ✓ Open Platform for applications deployment
- ✓ Supports multiple languages
- ✓ Open & Flexible
- ✓ Fully Managed & Infinite scalable
- ✓ Monitoring, Logging & Diagnosis
- ✓ Application Versioning
- ✓ Traffic Splitting (Red Green deployment)
- ✓ Provide Compute for any Load
- ✓ Flexible or Standard environment options.

GAE: How to Deploy app in GAE

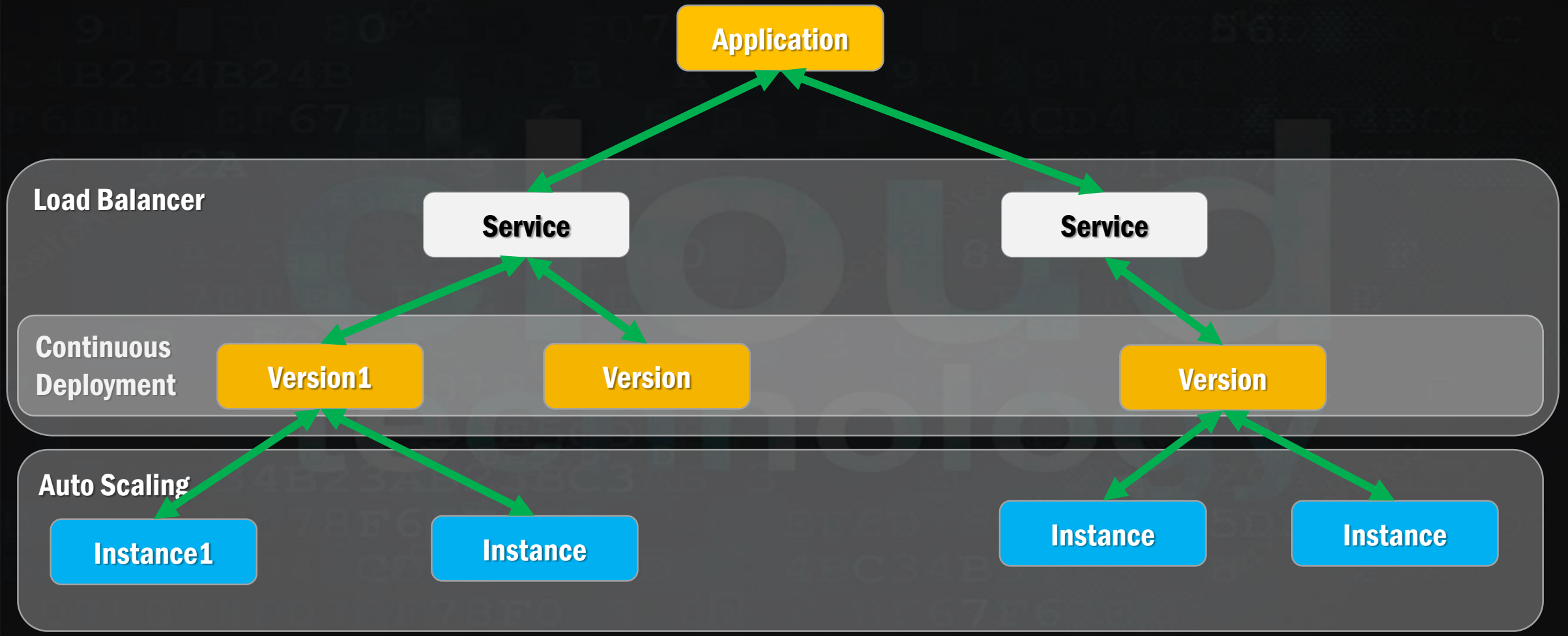
GAE

- ✓ gcloud init
- ✓ gcloud auth login
- ✓ gcloud app deploy

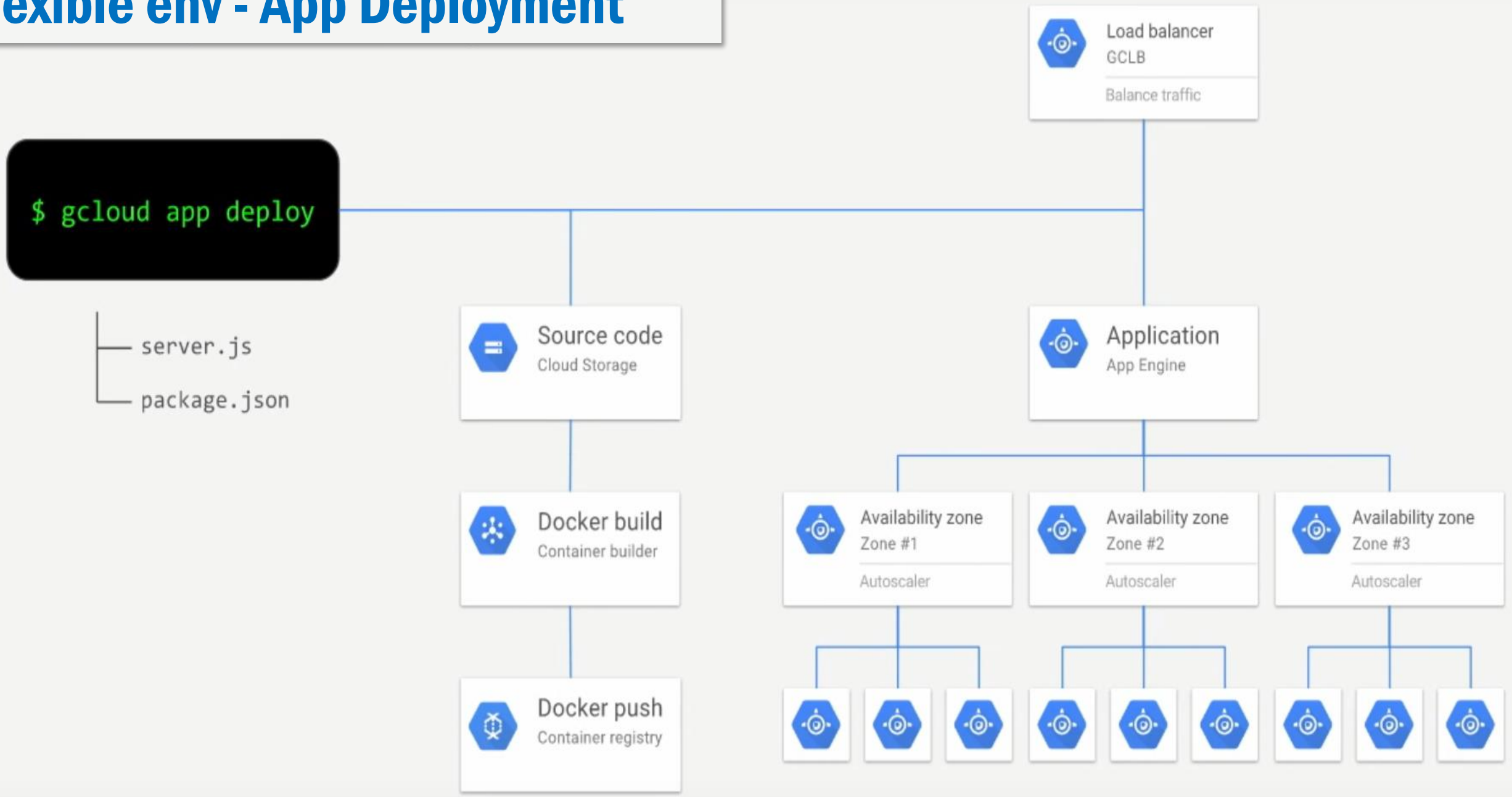
GAE Service Ecosystem



GAE Hierarchy



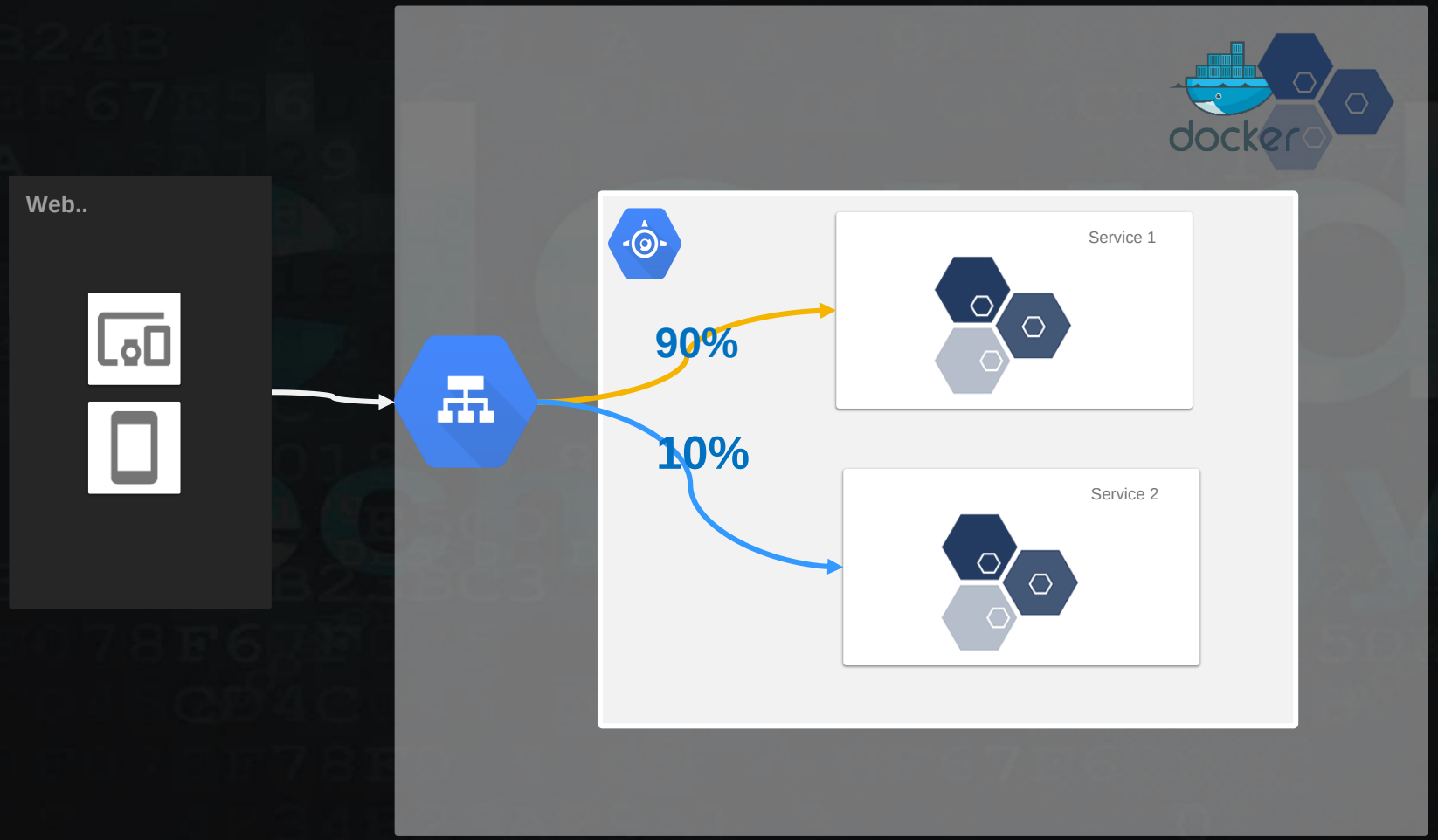
Flexible env - App Deployment



App Engine Deployment

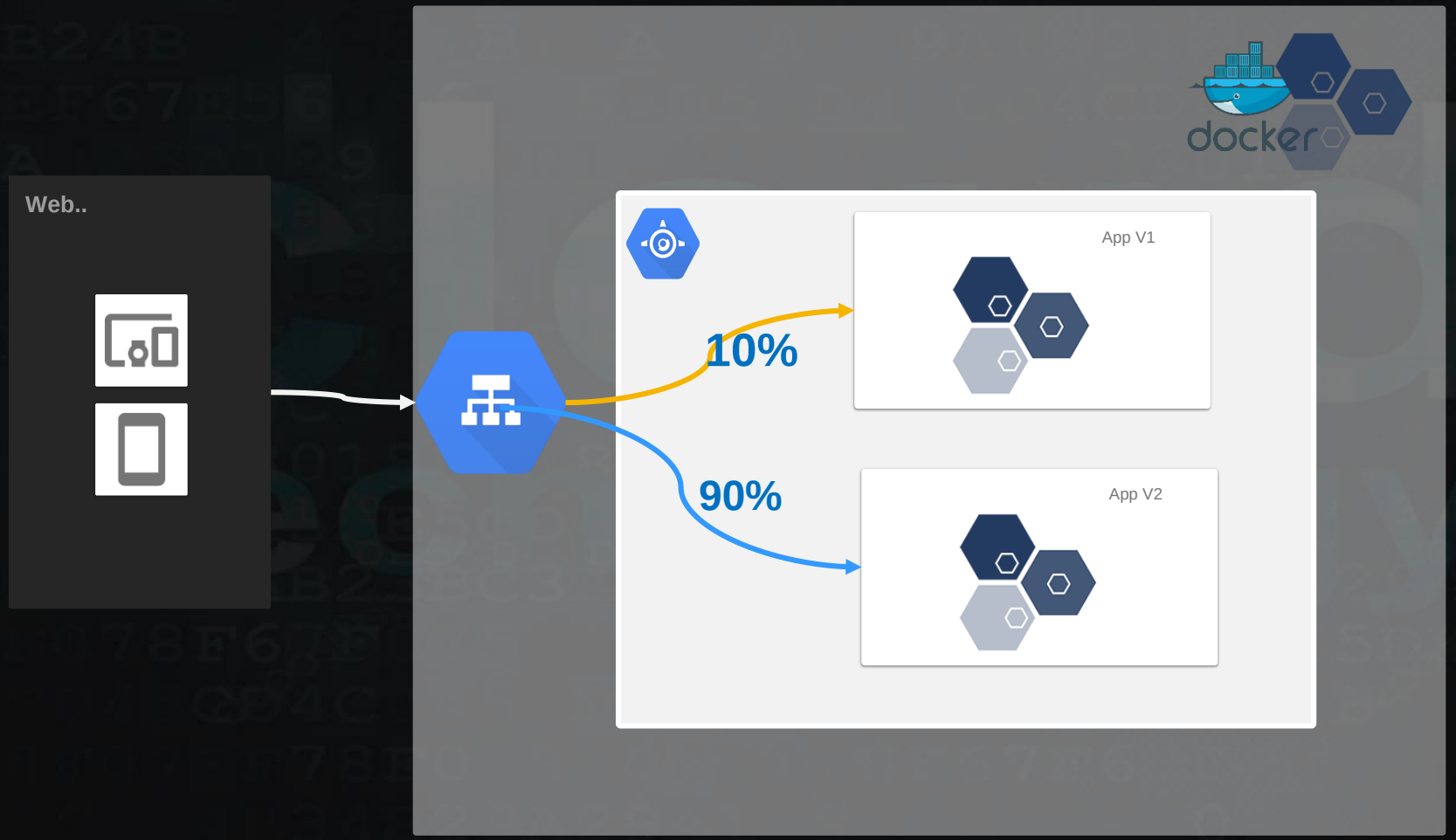
- Logging
- Autoscaling
- Load Balancing
- Monitoring
- Health Checking
- SSL & Domains

GAE：Traffic Splitting – Initial Release for new ver.

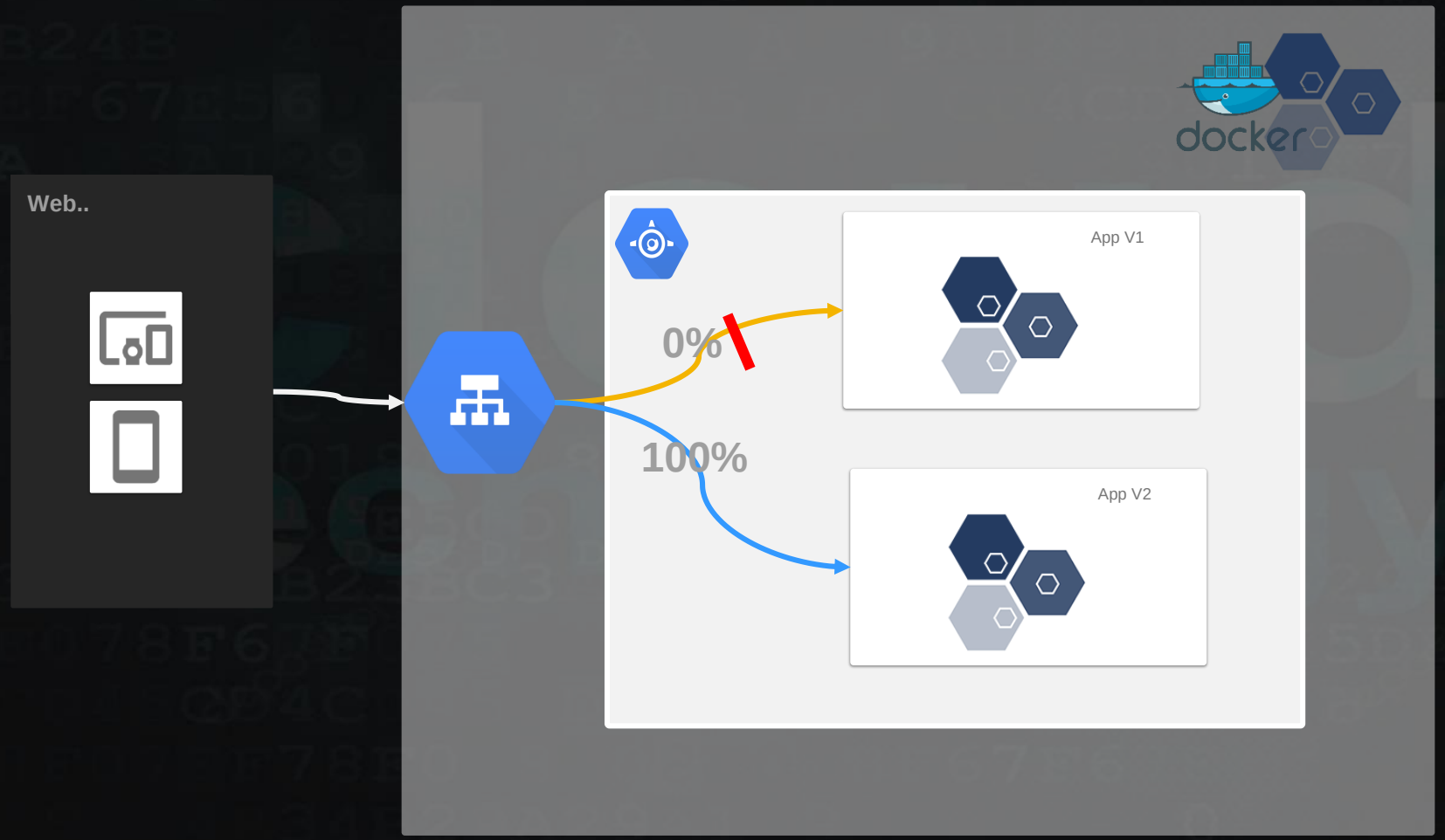


Google Cloud Platform

GAE：Traffic Splitting – Reverse % traffic



GAE：Traffic Splitting – switch over



GAE：Instance scaling

- Manual Scaling
- Automatic Scaling

GAE – python - > App.yaml sample & Scaling

```
runtime: python27
api_version: 1
threadsafe: true

handlers:
- url: /
  script: home.app

- url: /index\.html
  script: home.app

- url: /stylesheets
  static_dir: stylesheets

- url: /(.*\.(gif|png|jpg))$
  static_files: static/\1
  upload: static/.*\.(gif|png|jpg)$

- url: /admin/.*
  script: admin.app
  login: admin

- url: /.*
  script: not_found.app
```

```
service: my-service
runtime: python27
api_version: 1
instance_class: B8
basic_scaling:
  max_instances: 11
  idle_timeout: 10m
```

```
service: my-service
runtime: python27
api_version: 1
instance_class: F2
automatic_scaling:
  min_idle_instances: 5
  max_idle_instances: automatic  # default value
  min_pending_latency: 30ms  # default value
  max_pending_latency: automatic
  max_concurrent_requests: 50
```

```
service: my-service
runtime: python27
api_version: 1
instance_class: B8
manual_scaling:
  instances: 5
```

GAE : Limits

Description	Limit
Maximum services per application	5
Maximum versions per application	5 *
Maximum instances per version with manual scaling	20

Flexible & Standard Environment

Google App Engine

GAE: Flexible Environment - env: flex

GAE

Runtime

Developers can customize these runtimes or provide their own runtime by supplying a custom Docker image or Dockerfile from the open source community.

Infrastructure Customizations

VM instances in the flexible environment are Google Compute Engine virtual machines, you can take advantage of custom libraries, use SSH for debugging, and deploy your own Docker containers

Performance - Take advantage of a wide array of CPU and memory configurations. You can specify **how much CPU and memory** each instance of your application needs and the flexible environment will provision the necessary infrastructure for you.

GAE: Flexible Environment

GAE

App Engine manages your virtual machines, ensuring that:

- ✓ Instances are health-checked, healed as necessary, and co-located with other services within the project.
- ✓ Critical, backwards compatible updates are automatically applied to the underlying operating system.
- ✓ VM instances are automatically located by geographical region according to the settings in your project. Google's management services ensure that all of a project's VM instances are co-located for optimal performance.
- ✓ VM instances are restarted on a weekly basis. During restarts Google's management services will apply any necessary operating system and security updates.
- ✓ You always have root access to Compute Engine VM instances. SSH access to VM instances in the flexible environment is disabled by default. If you choose, you can enable root access to your app's VM instances

GAE: Standard Environment -

GAE

Runtime

Containers are predefined with one of the several runtime required.

Each runtime also includes libraries that support App Engine API.

Infrastructure Customizations

You cant customize env. – it has to be selected from preconfigured env.

Performance - Applications run in a secure, sandboxed environment, allowing App Engine standard environment to distribute requests across multiple servers, and scaling servers to meet traffic demands. Your application runs within its own secure, reliable environment that is independent of the hardware, operating system, or physical location of the server.

GAE: Standard Env. SDK

GAE

Software Development Kits (SDKs) for App Engine are available in all supported languages.

Each SDK includes:

- ✓ All of the APIs and libraries available to App Engine.
- ✓ **A simulated, secure sandbox environment, that emulates all of the App Engine services on your local computer.**
- ✓ Deployment tools that allow you to upload your application to the cloud and manage different versions of your application.

The SDK manages your application locally, while the Google Cloud Platform Console manages your application in production.

The Cloud Platform Console uses a web-based interface to create new applications, configure domain names, change which version of your application is live, examine access and error logs, and much more.

Flexible Environment

- ✓ Applications instance run **within Docker** Container on GCE and you have VM exposure
- ✓ **Used for Auto-Scaling**
- ✓ Rolling updates can be done
- ✓ **Changes to instance will make change in all the instances**
- ✓ Load balancing for only similar resources.
- ✓ **Programming languages: Python, Java, Node.js, Go, Ruby, PHP, or .NET**

Standard Environment

- ✓ Applications instance run in **specialized sandbox** for specific language.
- ✓ **Can not be used for Auto-Scaling**
- ✓ Rolling updates cant be used
- ✓ **Can make arbitrary changes in any instance**
- ✓ Can be used for load balancing pre-existing resources or Groups of dissimilar resources.
- ✓ **programming languages: Python 2.7, Java 7, Java 8, PHP 5.5, Go 1.6**

Feature	Flexible environment	Standard environment
Instance startup time	Minutes	Seconds
Maximum request timeout	60 minutes	60 seconds
Background threads	Yes	Yes, with restrictions
Background processes	Yes	No
SSH debugging	Yes	No
Scaling	Manual, Automatic	Manual, Basic, Automatic
Writing to local disk	Yes, ephemeral (disk initialized on each VM startup)	No
Modifying the runtime	Yes (through Dockerfile)	No
Automatic in-place security patches	Yes (excludes container image runtime)	Yes
Network access	Yes	Only via App Engine services (includes outbound sockets), and only for billing-enabled Python, Go, and PHP applications.
Supports installing third-party binaries	Yes	No
Location	North America, Asia Pacific, or Europe	North America, Asia Pacific, or Europe
Pricing	Based on usage of vCPU, memory, and persistent disks	Based on instance hours

GAE : Comparing the flexible environment to GCE

While the flexible environment runs services in instances on Compute Engine VMs, the flexible environment differs from Compute Engine in the following ways:

- The VM instances used in the flexible environment are **restarted on a weekly basis**. During restarts, Google's management services apply any necessary operating system and security updates.
- You always have **root access to Compute Engine VM instances**. By default, SSH access to the VM instances in the flexible environment is disabled. If you choose, you can enable root access to your app's VM instances.
- The **geographical** region of the VM instances used in the **flexible environment** is determined by the location that you specify for the App Engine application of your Cloud Platform project. Google's management services ensures that the VM instances are **co-located for optimal performance**

GAE : Resource Billing Rate – Standard

- ✓ Standard Env. Instances
- ✓ Flexible Env Instances
- ✓ Google Cloud Datastore Calls
- ✓ Search API
- ✓ Other
  - ✓ Network Traffic – in GB
  - ✓ Memcache – in GB
  - ✓ Blobstore – in GB
  - ✓ Logs API

South Carolina

Instance class	Cost per hour per instance
B1	$0.05
B2	$0.10
B4	$0.20
B4_1G	$0.30
B8	$0.40
F1	$0.05
F2	$0.10
F4	$0.20
F4_1G	$0.30

South Carolina

Resource	Unit	Unit cost
vCPU	per core hour	$0.0526
Memory	per GB hour	$0.0071
Persistent disk	per GB per month	$0.0400

South Carolina

Resource	Unit	Unit cost (in US $)
Outgoing network traffic - standard environment*	Gigabytes	$0.12
Outgoing network traffic - flexible environment	Gigabytes	Google Compute Engine Network Rates
Incoming network traffic	Gigabytes	Free
Blobstore and Task Queue stored data**	Gigabytes per month	$0.026
Dedicated memcache	Gigabytes per hour	$0.06
Logs API	Gigabytes	$0.12
Sending email, shared memcache, cron, APIs (Task Queues, Image, Files, Users, and Channel)		No Additional Charge

Google Compute Engine

Google App Engine

Demo Next ....

Google Cloud Platform

End