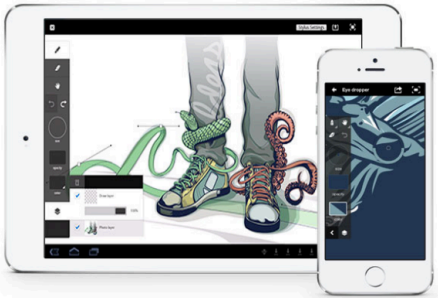

https://github.com/adobe-apiplatform
Be a Microservices Hero
Shuai Zhang | Adobe
Presentation scripts: https://gist.github.com/ddragosd/608bf8d3d13e3f688874

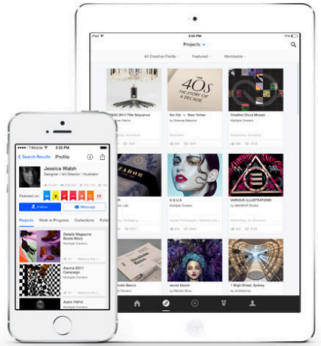
Lightroom mobile

Photoshop Mix

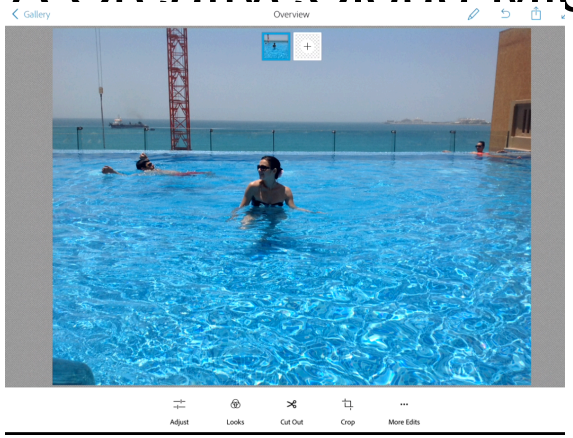
Ideas

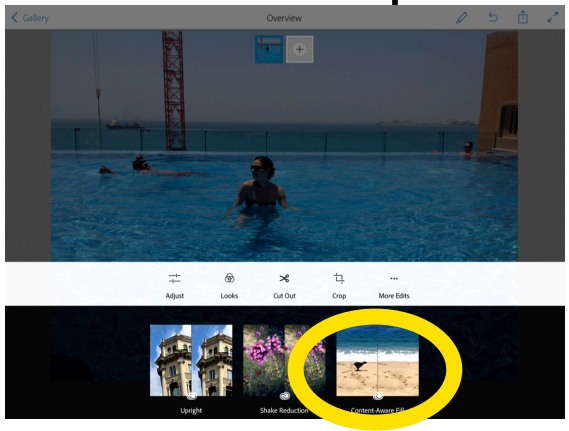


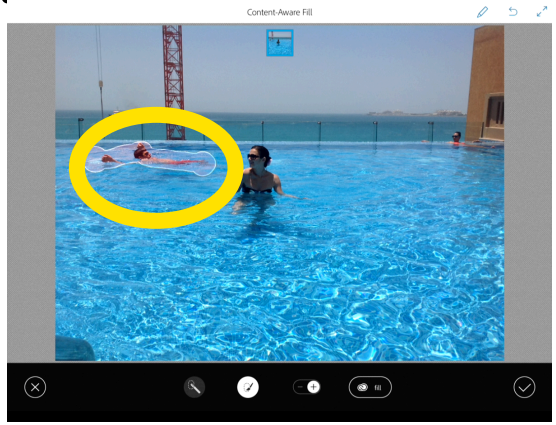
Behance

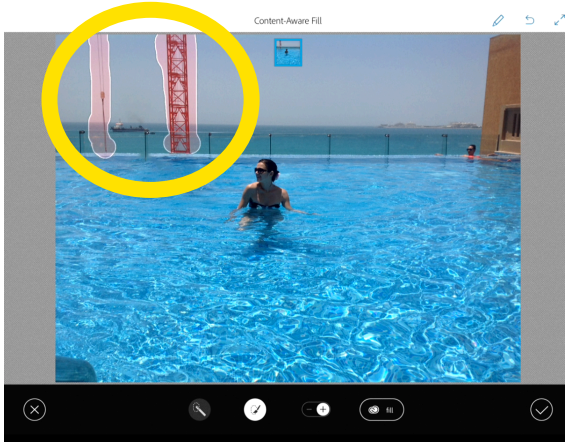


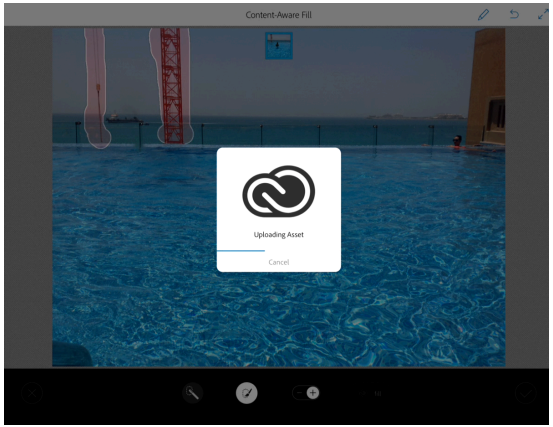
# A CreativeCloud Microservice Sample: Content-Aware fill

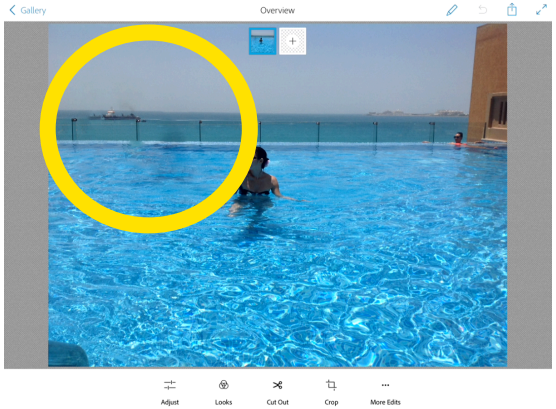


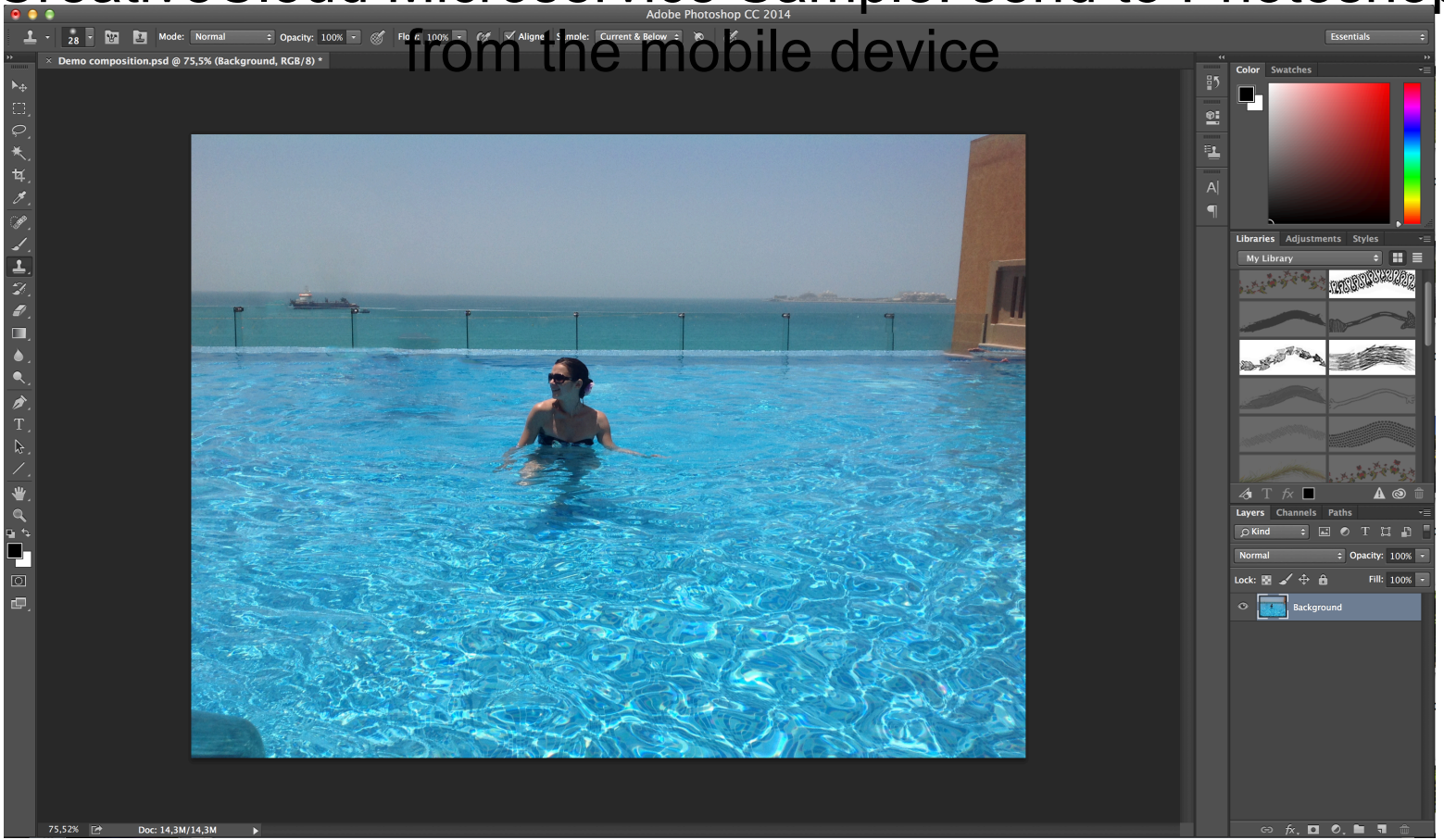



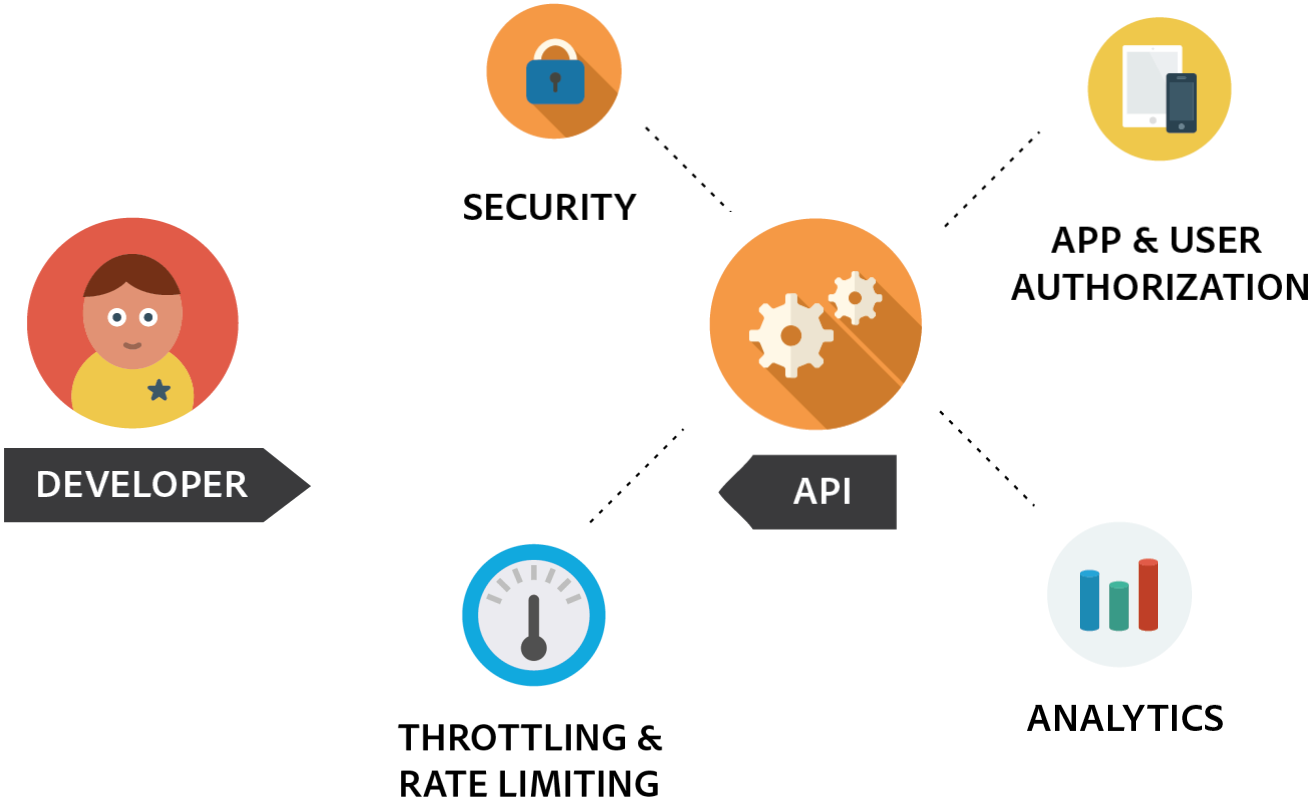



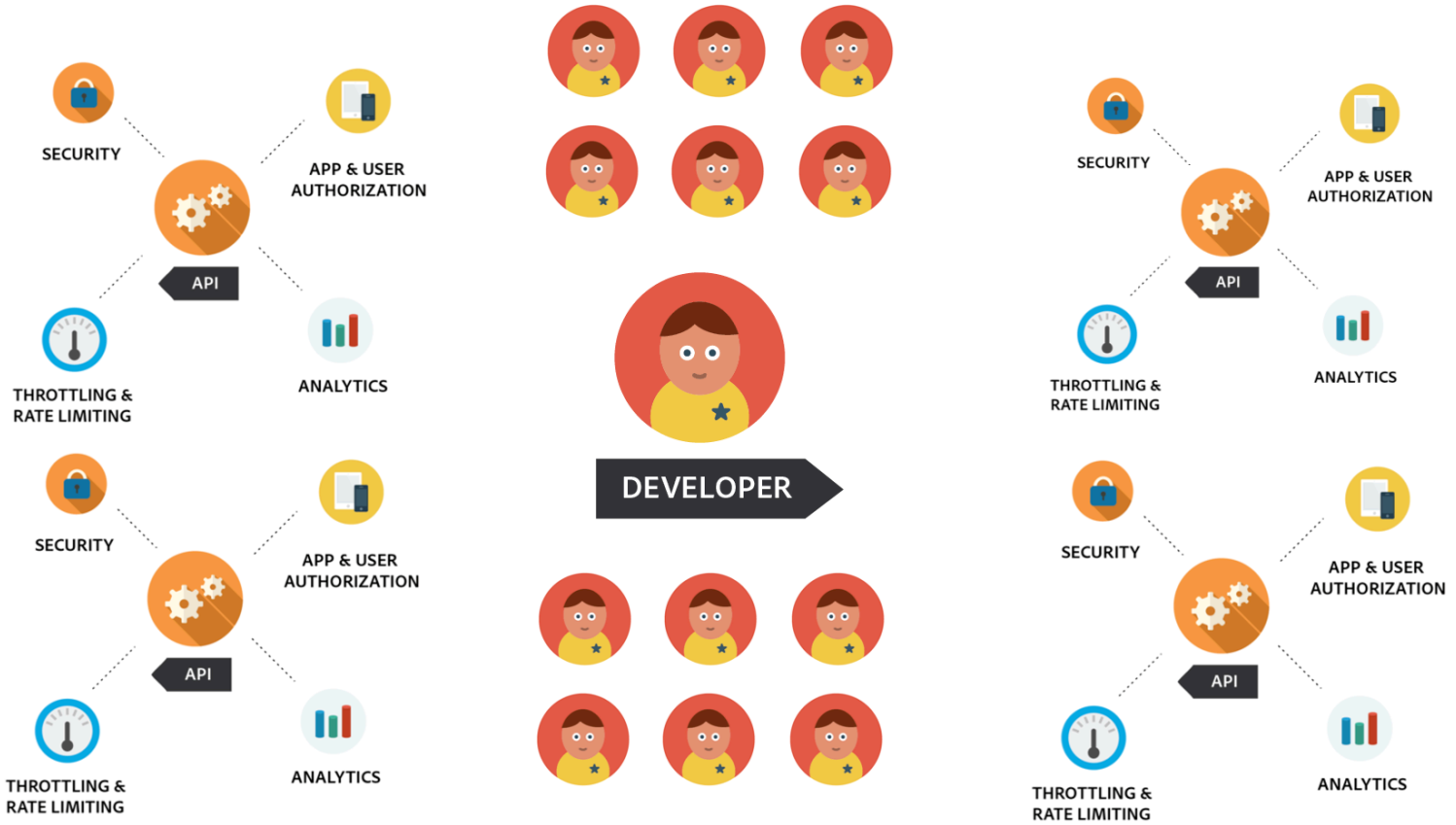
# A CreativeCloud Microservice Sample: send to Photoshop from the mobile device



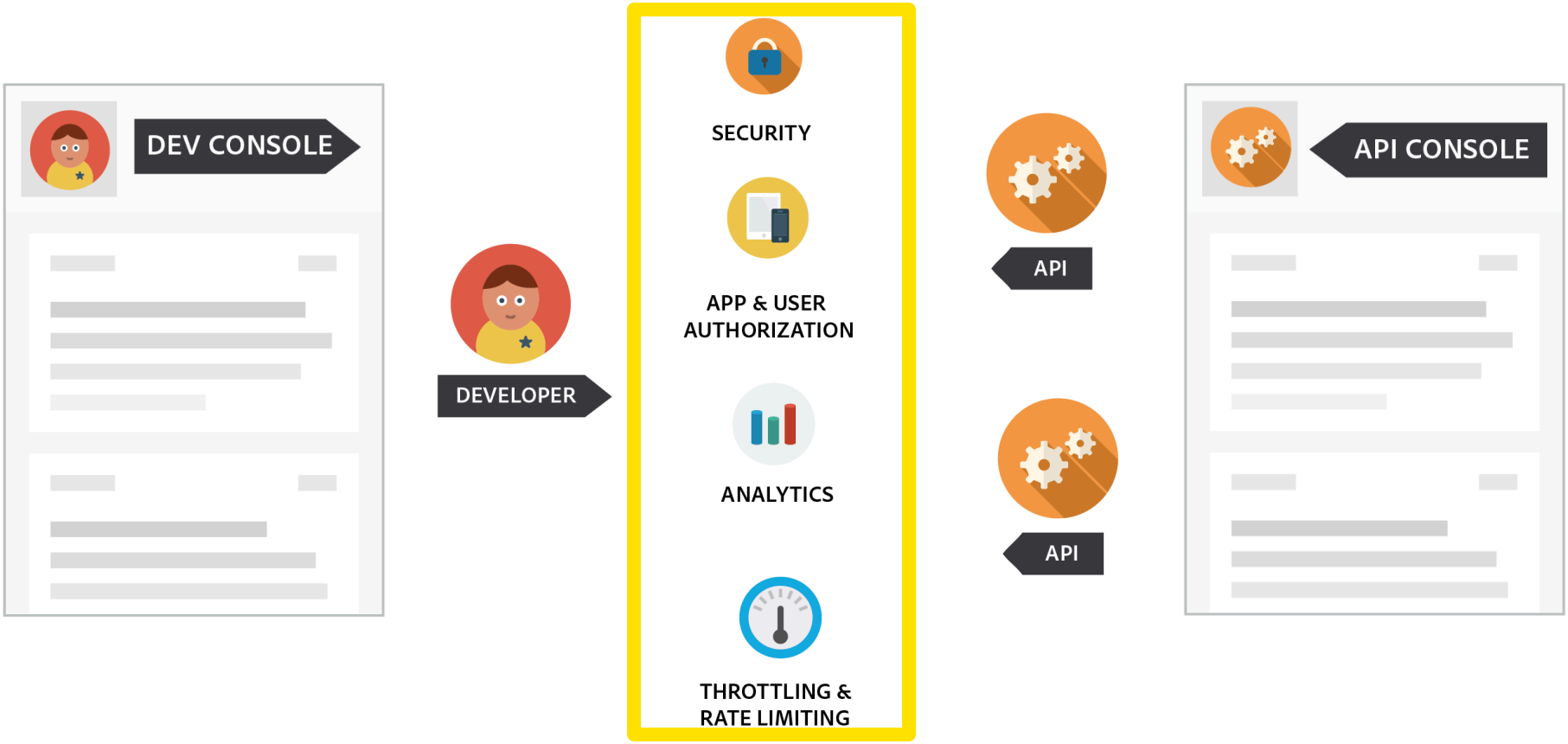
# Lifecycle of a microservice



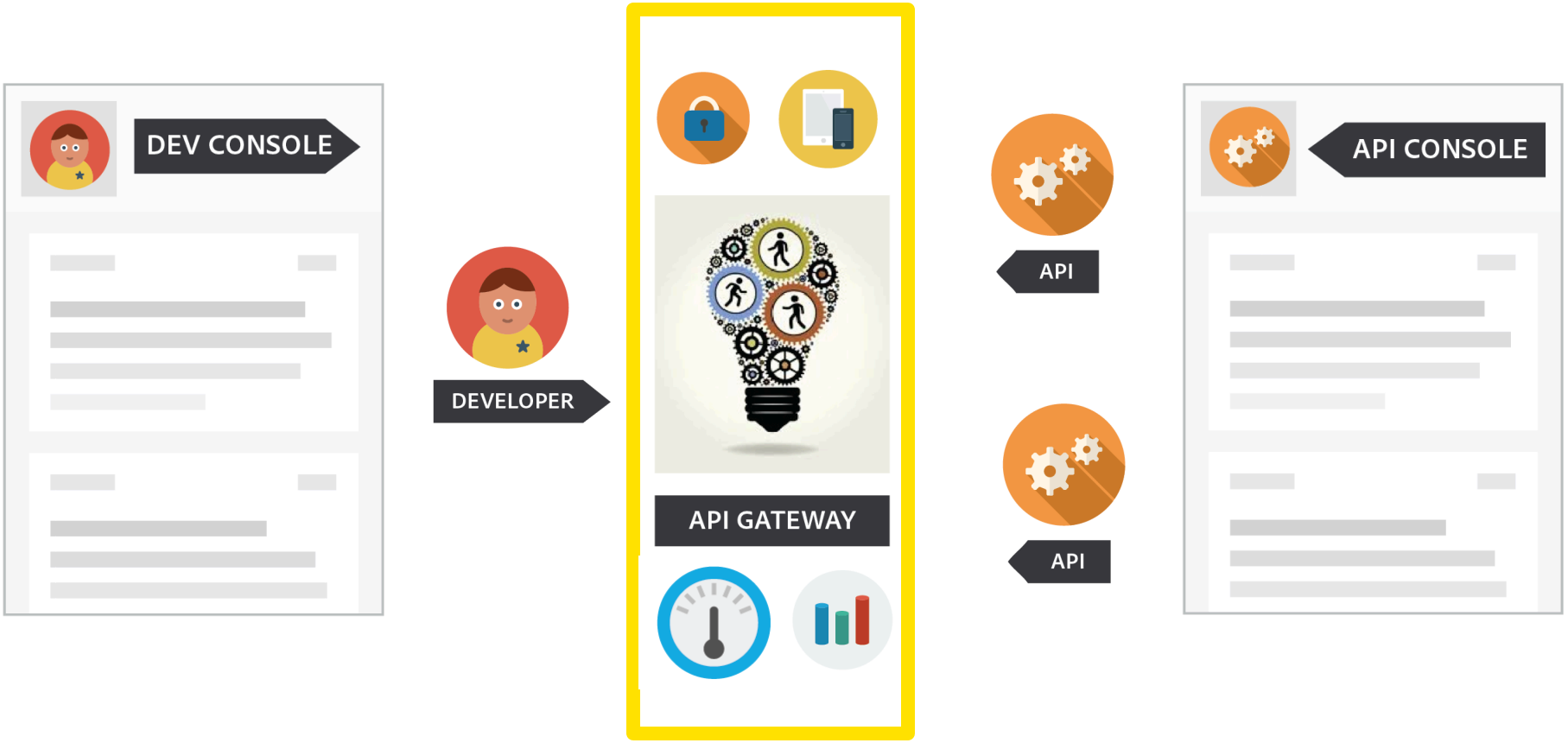
# Growing the microservices ecosystem

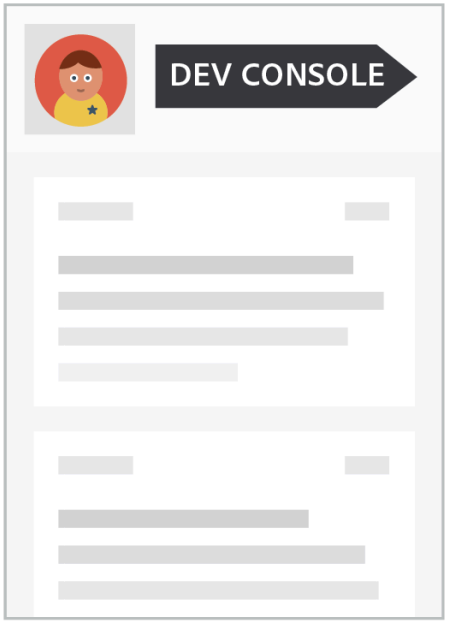


# API Platform



# API Platform






MENU SEARCH DRAGOS Adobe

Adobe Creative SDK

Overview Featured Apps Documentation Downloads My Apps Blog

# My Apps

2015-02-10 to 2015-I UPDATE

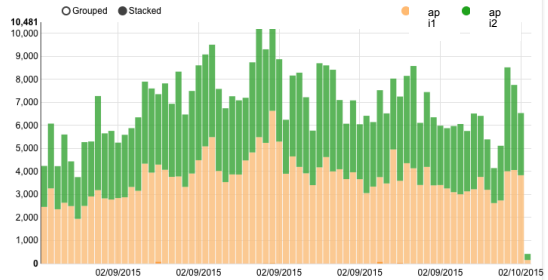
Total Number of Calls

**499.0k**

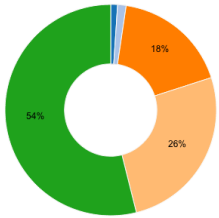
Total Number of Errors (500s)

**1**

Top 5 services

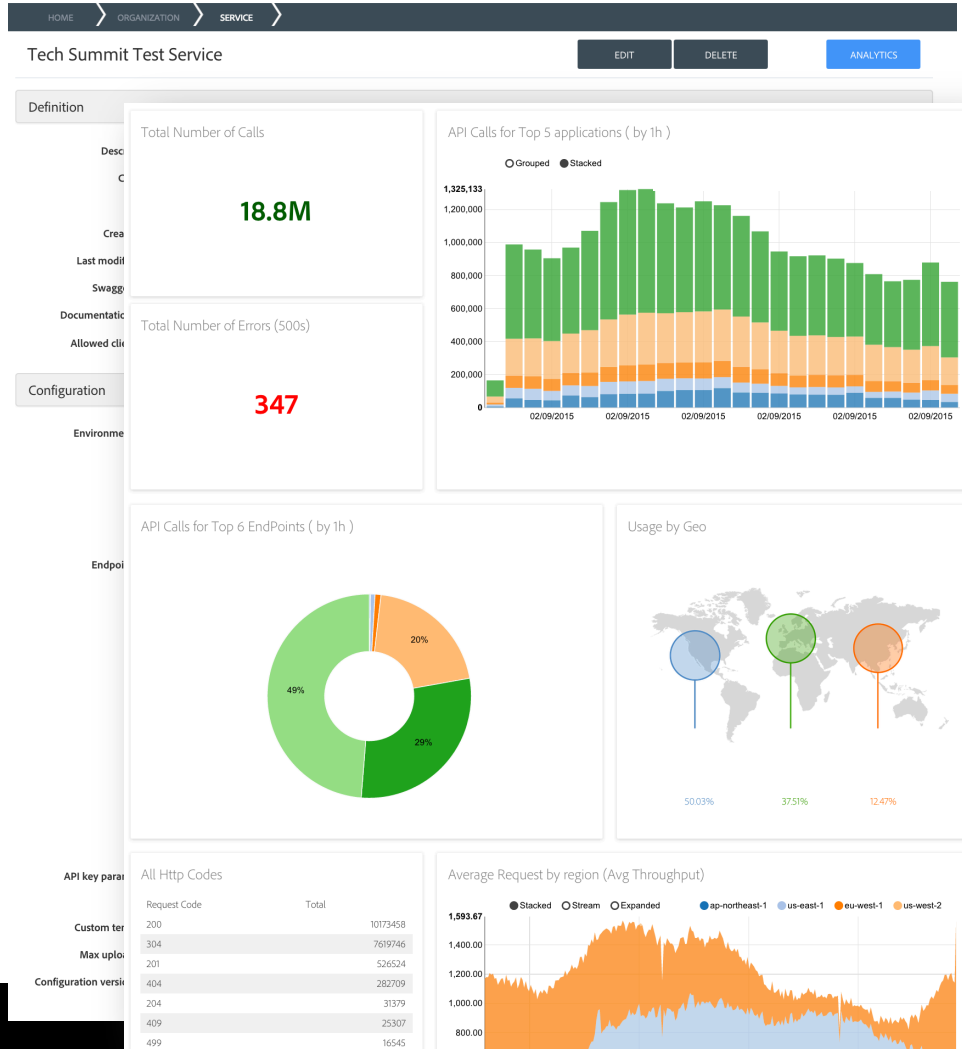



Top 5 EndPoints Used By the App



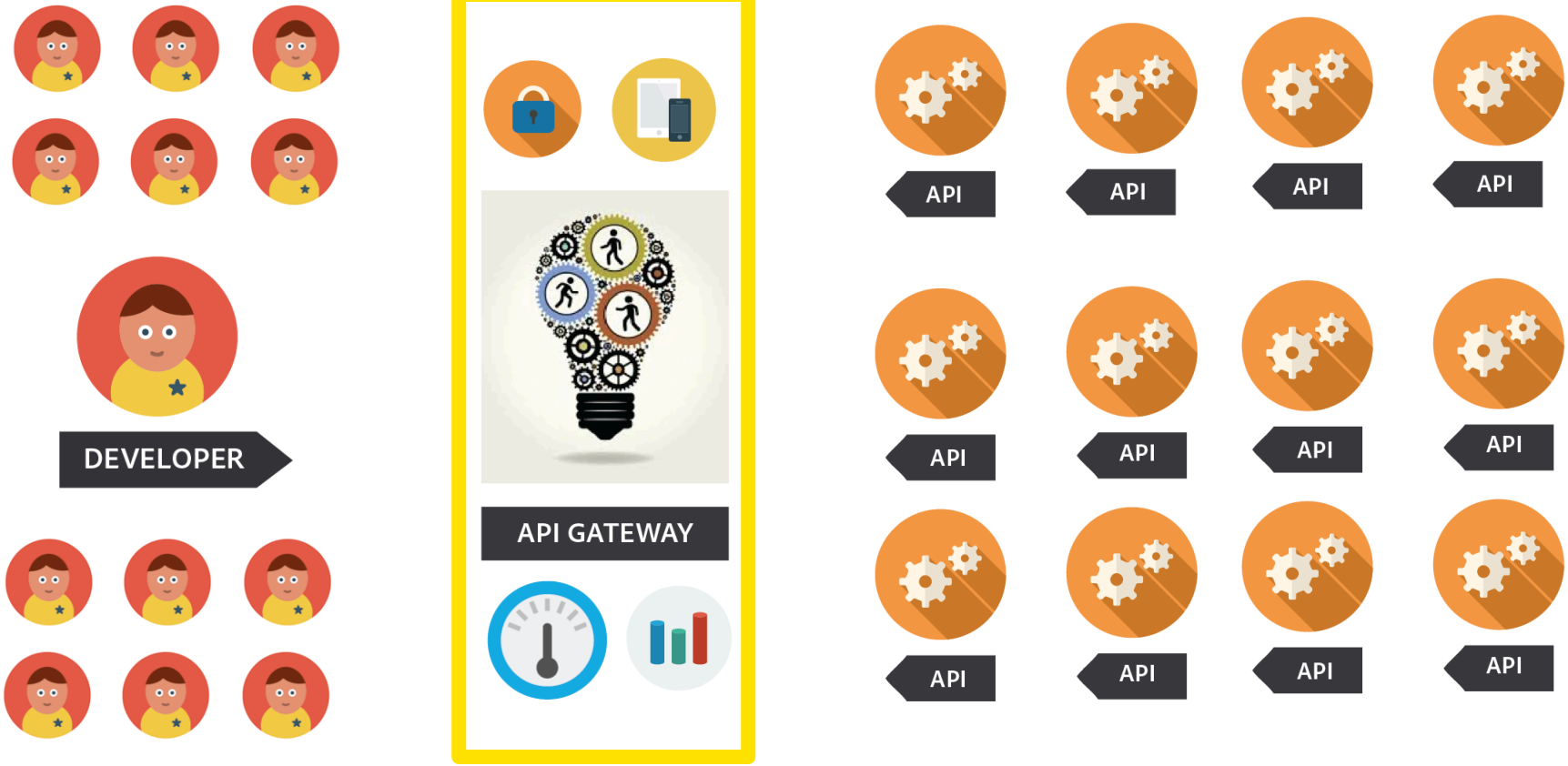

All Http Codes

| Request Code | Total |
|---|---|
| 200 | 331889 |
| 304 | 114523 |
| 201 | 35339 |
| 204 | 6994 |
| 409 | 5175 |
| 404 | 3442 |
| 400 | 708 |
| 408 | 497 |
| 412 | 210 |


HOME
ORGANIZATION
SERVICE
Tech Summit Test Service
EDIT
DELETE
ANALYTICS
Definition
Configuration
Total Number of Calls
18.8M
Total Number of Errors (500s)
347
API Calls for Top 5 applications ( by 1h )
Grouped
Stacked
1,325,133
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
02/09/2015
02/09/2015
02/09/2015
02/09/2015
02/09/2015
02/09/2015
API Calls for Top 6 EndPoints ( by 1h )
20%
49%
29%
Usage by Geo
50.03%
37.51%
12.47%
All Http Codes
Request Code
Total
200 10173458
304 7619746
201 526524
404 282709
204 31379
409 25307
499 16545
Average Request by region (Avg Throughput)
Stacked
Stream
Expanded
ap-northeast-1
us-east-1
eu-west-1
us-west-2
1,593.67
1,400.00
1,200.00
1,000.00
800.00


API CONSOLE

# How to make it easier to scale Microservices in this model ?



**Microservices** , **Containers** & **Apache Mesos**

write containerize & deploy

write containerize & deploy

write containerize & deploy



# Apache Mesos

# Apache Mesos & Microservices

*"Program for the data center*
*Just like you program for the OS"*

| | |
|---|---|
| Computer: | **Data Center** |
| Kernel: | **Mesos** |
| OS: | **Mesos Frameworks, Marathon, Mesosphere's DCOS** |
| Services: | **Microservices** |
| Traffic Ctrl: | **API Gateway** |

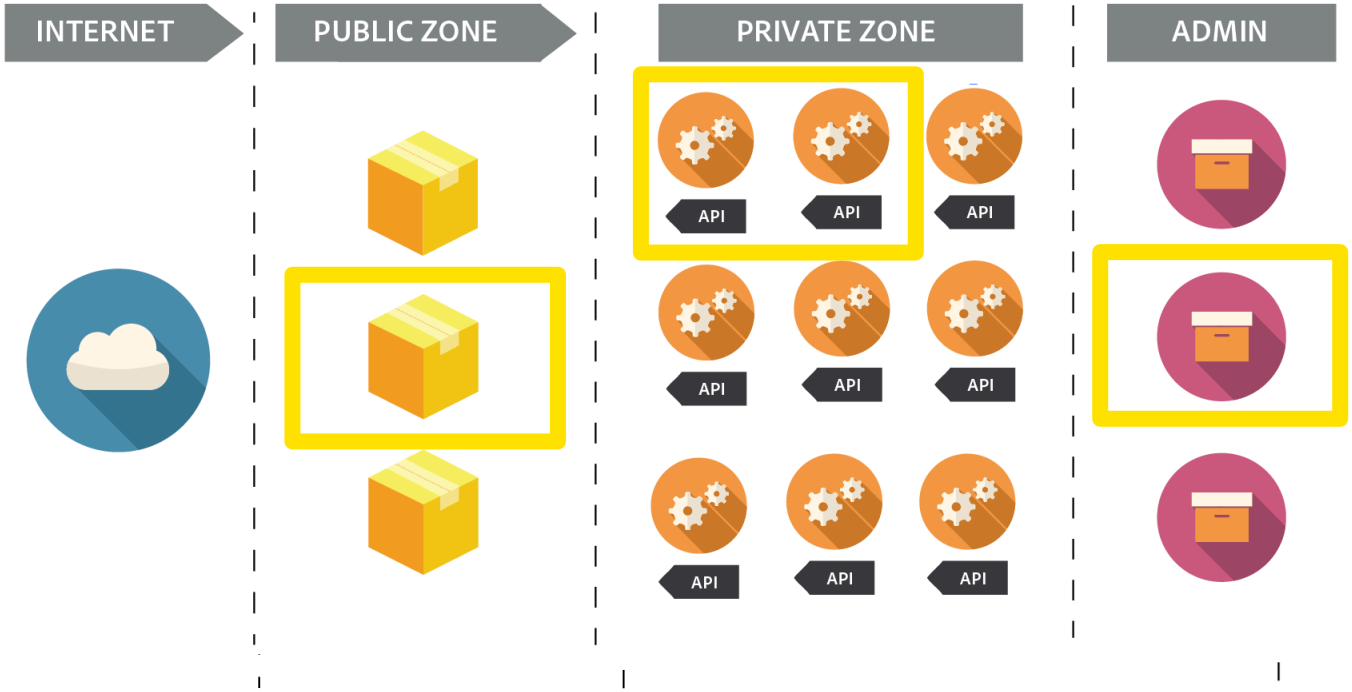
- Facilitates inter-API communication
- Routing, Throttling, rate limiting

# #DEMO

## Apache Mesos & Microservices

*SETUP A MINI-DATA-CENTER*

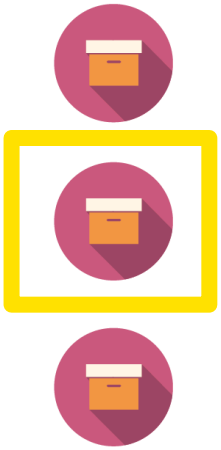
*4 VMs: 1 Leader, 3 Slaves*

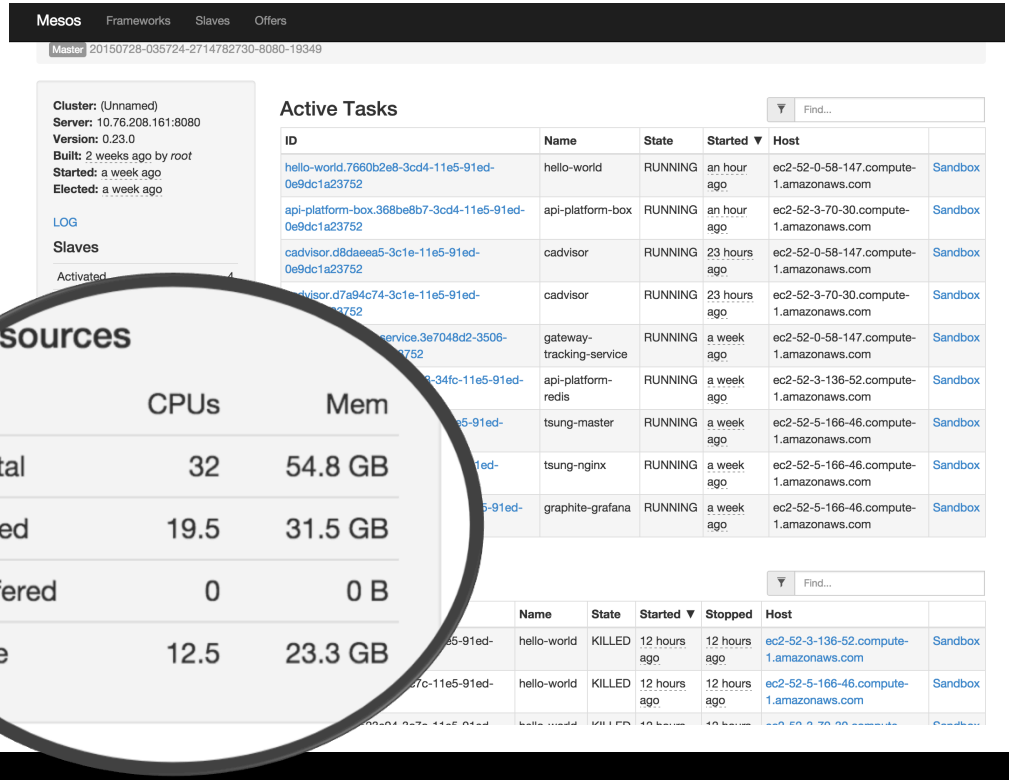


# #DEMO
# Apache Mesos & Microservices

## *THE "KERNEL": MESOS*
## *1 Leader, 3 Slaves*

ADMIN

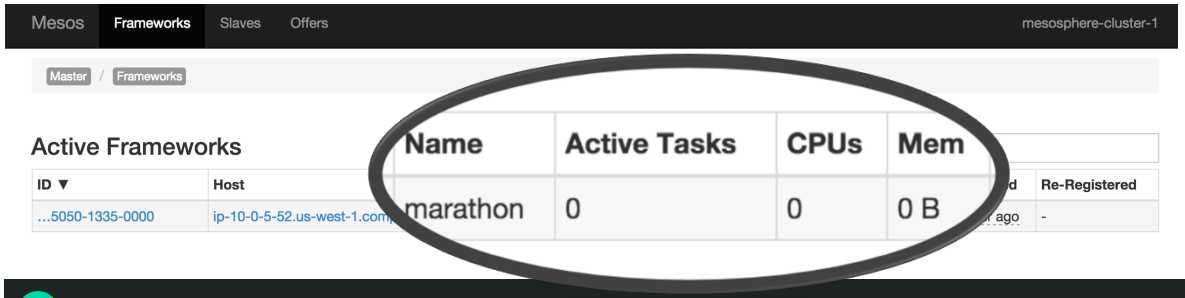


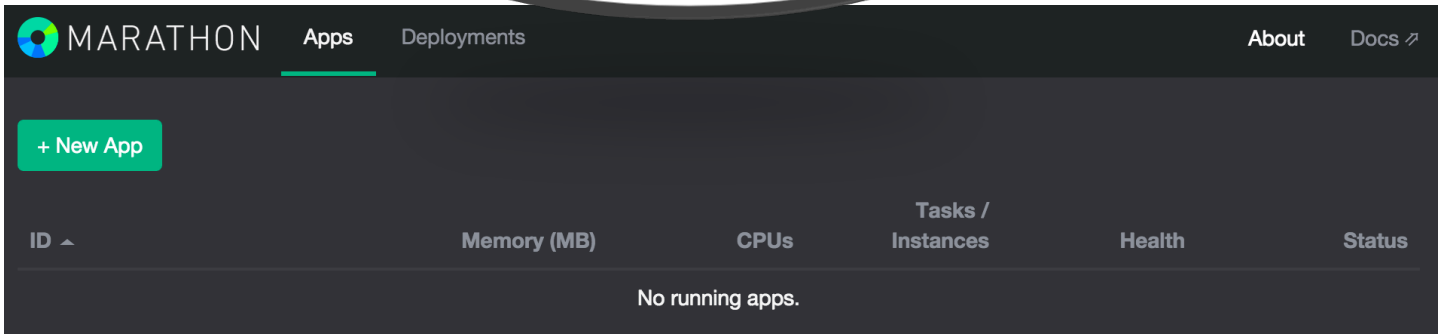


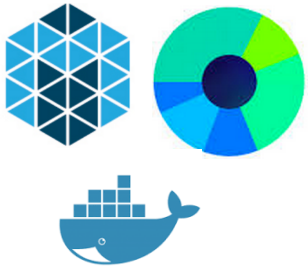
# #DEMO
# Apache Mesos & Microservices

*THE "OS" : MARATHON ( it will start our microservices )*

ADMIN



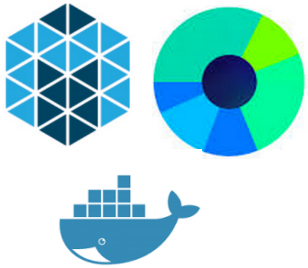


# #DEMO
# Apache Mesos & Microservices

## START A "SERVICE" IN THE "OS": Hello-world microservice

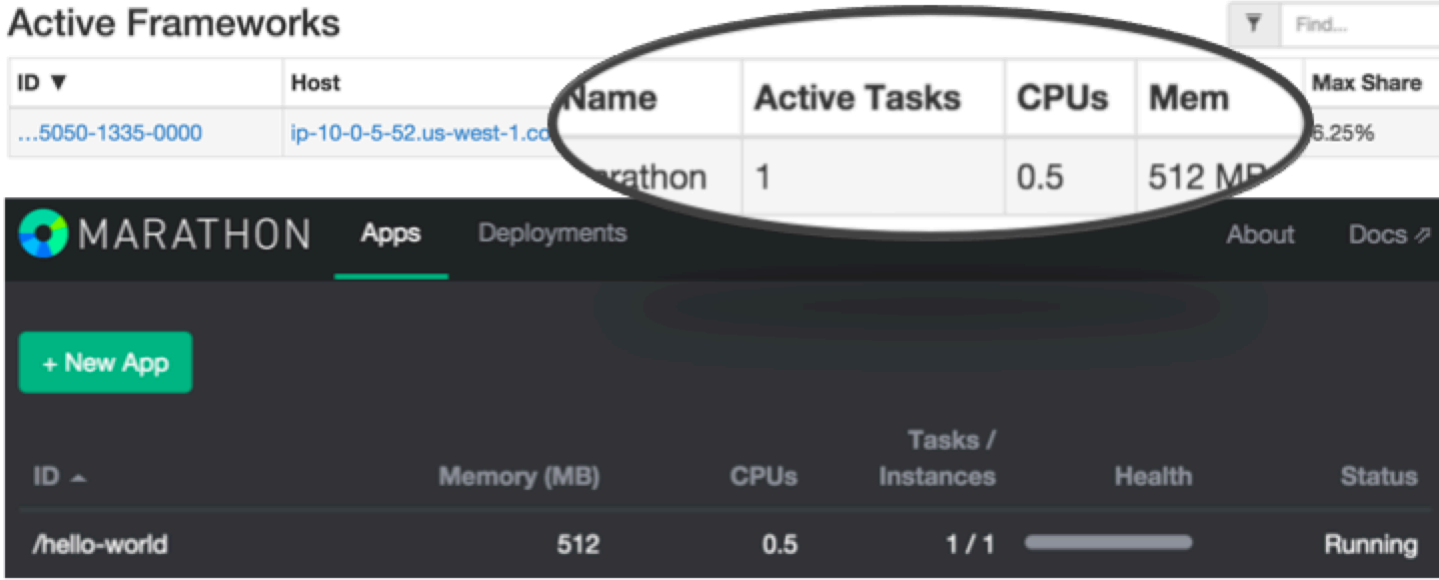
```
curl "http://<marathon_url>/v2/apps" \
    -H "Content-Type: application/json" \
    -H "Accept:application/json" \
    --data @/tmp/hello_world_app.json
```

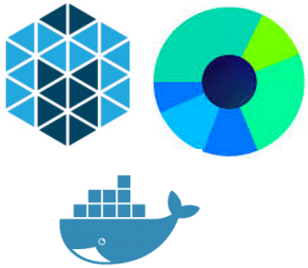
```
{
  "id": "hello-world",
  "container": {
    "type": "DOCKER",
    "docker": {
      "image": "tutum/hello-world",
      "forcePullImage": true,
      "network": "BRIDGE",
      "portMappings": [
          {
            "containerPort": 80,
            "hostPort": 0,
            "protocol": "tcp"
          }
        ]
    }
  },
  "cpus": 0.5,
  "mem": 512,
  "instances": 1
}
```



# #DEMO
# Apache Mesos & Microservices

## *START A "SERVICE" IN THE "OS": Hello-world microservice*





# #DEMO
# Apache Mesos & Microservices

## *THE "TRAFFIC CTRL" : API GATEWAY*

OPENRESTY

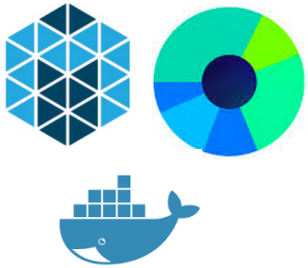
- Nginx Lua Module
- Nginx Redis
- Headers more
- Set misc
- LuaJIT
- ….

NGINX

- Upstream
- HTTP Proxy
- PCRE
- SSL
- ….

Custom Modules

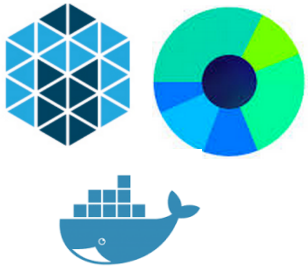
- NAXSI – WAF
- api-gateway request-validation
- api-gateway-async-logger



# #DEMO
# Apache Mesos & Microservices

## *THE "TRAFFIC CTRL" : API GATEWAY*
### *Simple configuration blending in Nginx configuration*

```
server {
    listen 80;
    server_name hello-world.api.container-con.org;

    location / {
        #
-------------------------------------------------
        #  Specify what to validate for this location
        #
-------------------------------------------------
        set $validate_api_key          on;
        set $validate_oauth_token      on;
        set $validate_user_profile     on;
        set $validate service plan     on;
        ...
        #
-------------------------------------------------
        #  Proxy the request to the actual microservice
        #
-------------------------------------------------
```



# #DEMO
# Apache Mesos & Microservices

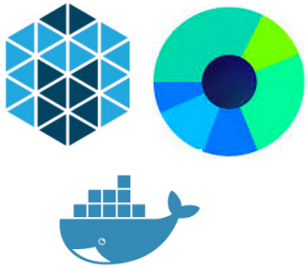
## *THE "TRAFFIC CTRL" : API GATEWAY*
## *Service Discovery Example*

```
ello-world   api.openresty.org
```

```
server {
    listen 80;
    server_name ~^(?<app_name>.[^\.]   \.api\.(?
<domain>.+);
    …
}
```

```
upstream hello-world {
  server host1.compute.internal:3082;
  server host2.compute.internal:2105;
  server host3.compute.internal:15861;
  keepalive 16;
}
```

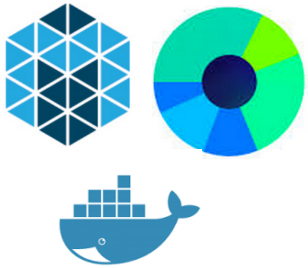
```
curl -s ${marathon_host}/v2/tasks -H "Accept:text/plain" | \
  awk 'NF>2' | grep -v ':0' | awk '!seen[$1]++' | \
  awk ' {s=""; for (f=3; f<=NF; f++) s = s  "\n server " $f ";" ; print "upstream " $1 " {"  s  "\n keepalive 16;\n}" }'
```



# #DEMO
# Apache Mesos & Microservices

## THE “TRAFFIC CTRL” : API GATEWAY ( OPENRESTY & NGINX based)

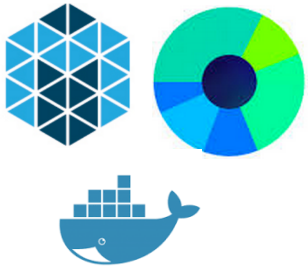
```
server {
    listen 80;

    # listenes on <app_name>.api.any.domain with the assumption that the app_name has been defined in marathon.
    server_name ~^(?<app_name>.[^\.]+)\.api\.(?<domain>.+);

    location / {

        proxy_connect_timeout 10s;  # timeout for establishing a connection with a proxied server

        proxy_read_timeout 10s;     # Defines a timeout for reading a response from the proxied server.
                                    # The timeout is set only between two successive read operations,
                                    # not for the transmission of the whole response.

        proxy_send_timeout 10s;     # Sets a timeout for transmitting a request to the proxied server.
                                    # The timeout is set only between two successive write operations,
                                    # not for the transmission of the whole request.
        keepalive_timeout 10s;      # timeout during which a keep-alive client connection stays open on the server side
        proxy_buffering off;        # enables or disables buffering of responses from the proxied server.
        proxy_http_version 1.1;     # Version 1.1 is recommended for use with keepalive connections.
        proxy_set_header Connection "";

        proxy_pass http://$app_name$request_uri;
    }
}
```



# #DEMO
# Apache Mesos & Microservices

## *THE "TRAFFIC CTRL" : API GATEWAY DEPLOYMENT*

```
curl -X POST -H "Content-Type:application/json" ${MARATHON_HOST}/v2/apps?force=true --data '
{
  "id": "api-gateway"
  "container": {
    "type": "DOCKER",
    "docker": {
      "image": "adobeapiplatform/apigateway:latest",
      "network": "HOST"
    }
  },
  "cpus": 4,
  "mem": 4028.0,
  "acceptedResourceRoles": ["slave_public"],
  "ports": [ 80 ],
  "instances": 1
}
```



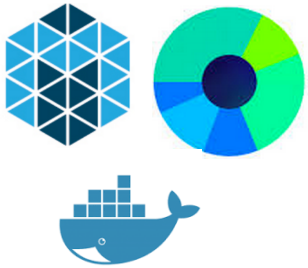
# #DEMO
# Apache Mesos & Microservices

## *THE "TRAFFIC CTRL" : API GATEWAY DEPLOYMENT*

```
curl -X POST -H "Content-Type:application/json" ${MARATHON_HOST}/v2/apps?force=true --data '
{
  "id": "api-gateway",
  "container": {
    "type": "DOCKER",
    "docker": {
      "image": "apiplatform/apigateway:latest",
      "forcePullImage": true,
      "network": "HOST"
    }
  },
  "cpus": 4,
  "mem": 4028.0,
  "env": { "MARATHON_HOST": "http://<marathon_host>" },
   "acceptedResourceRoles": ["slave_public"],
   "constraints": [   [ "hostname", "UNIQUE" ]  ],
  "ports": [ 80 ],
  "instances": 1,
  <health_check_block>
}
```

Optionally you can include health-check

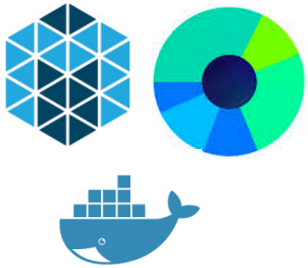
```
"healthChecks": [
  {
    "protocol": "HTTP",
    "portIndex": 0,
    "path": "/health-check",
    "gracePeriodSeconds": 3,
    "intervalSeconds": 10,
    "timeoutSeconds": 10
  }
]
```



# #DEMO
# Apache Mesos & Microservices

## *THE "TRAFFIC CTRL" : API GATEWAY*

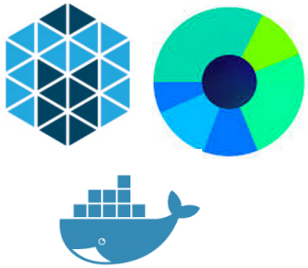
- *Demo: API KEY Management*



# #DEMO
# Apache Mesos & Microservices

## *THE "TRAFFIC CTRL" : API GATEWAY*
## *API KEY Management with Redis*

```
curl -X POST -H "Content-Type:application/json" ${MARATHON_HOST}/v2/apps?force=true --data '
{
  "id": "api-gateway-redis",
  "container": {
    "type": "DOCKER",
    "docker": {
      "image": "redis:latest",
      "forcePullImage": true,
      "network": "HOST"
    }
  },
  "cpus": 0.5,
  "mem": 1024.0,
  "constraints": [    [ "hostname", "UNIQUE" ]   ],
  "ports": [ 0 ],
  "instances": 1
}'
```

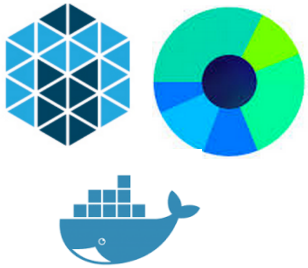


# #DEMO
# Apache Mesos & Microservices

## THE “TRAFFIC CTRL” : API GATEWAY
## Protect a service with API-KEY

Create a new Vhost for server_name ~hello-world.api.(?<domain>.+);

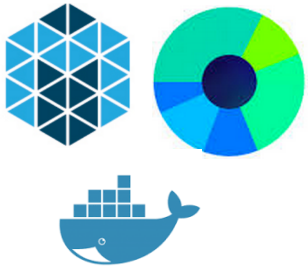
```
set $marathon_app_name hello-world;

location / {
      …
      # identify the service
      set $service_id $marathon_app_name;

      # identify the api key
      #     either from the query params or from the "Api-Key" header
      set $api_key $arg_api_key;
      set_if_empty $api_key $http_x_api_key;

      # add the api-key validator
      set $validate_api_key on;

      # validate request
      access_by_lua "ngx.apiGateway.validation.validateRequest()";

      proxy_pass http://$marathon_app_name$request_uri;
```



# #DEMO
# Apache Mesos & Microservices

## *THE "TRAFFIC CTRL" : API GATEWAY*
## *Protect a service with API-KEY*

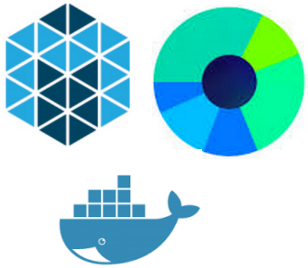
```
# ADD an API-KEY for the HELLO-WORLD service
# NOTE: this API SHOULD not be exposed publicly

curl -X POST "http://api-gateway.${API_DOMAIN}/cache/api_key?key=key-1&\
app_name=app-1&\
service_id=hello-world&\
service_name=hello-world&\
consumer_org_name=demo-consumer"

# update hello-world microservice to require an API-KEY
curl "http://hello-world.${API_DOMAIN}/hello"
# {"error_code":"403000","message":"Api Key is required"}

# make another call including the api-key
curl "http://hello-world.${API_DOMAIN}/hello" -H "X-Api-Key:key-1"
```



# #DEMO
# Apache Mesos & Microservices

## *THE "TRAFFIC CTRL" : API GATEWAY*
## *Capture Analytics*

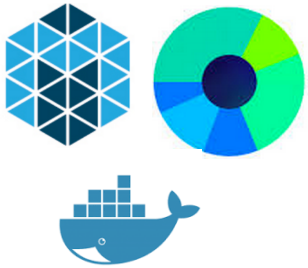
- *Demo: Analytics using Graphite and Grafana*



# #DEMO
# Apache Mesos & Microservices

## THE "TRAFFIC CTRL" : API GATEWAY
## Capture Analytics: update config

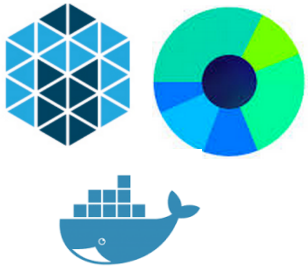
```
set $marathon_app_name hello-world;

location / {
      …

      proxy_pass http://$marathon_app_name$request_uri;

      …

    # capture usage data
    log_by_lua '
        if ( ngx.apiGateway.metrics ~= nil ) then
            ngx.apiGateway.metrics.captureUsageData )
        end
    ';

}
```



# #DEMO
# Apache Mesos & Microservices

## *THE "TRAFFIC CTRL" : API GATEWAY Capture Analytics*

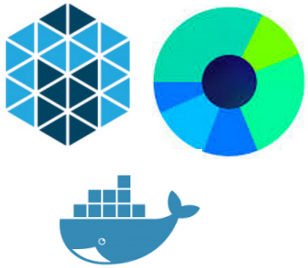
```
curl -X POST -H "Content-Type:application/json" ${MARATHON_HOST}/v2/apps?force=true --
data '
{
  "id": "api-gateway-graphite",
  "container": {
    "type": "DOCKER",
    "docker": {
      "image": "hopsoft/graphite-statsd:latest",
      "forcePullImage": true,
      "network": "BRIDGE",
      "portMappings": [
          { "containerPort": 80,  "hostPort": 0,    "protocol": "tcp" },
          { "containerPort": 8125 "hostPort": 8125  "protocol": "udp"}
        ]
    }
  },
  "cpus": 2,
  "mem": 4096.0,
  "instances": 1
}'
```



# #DEMO
# Apache Mesos & Microservices

## *THE "TRAFFIC CTRL" : API GATEWAY*
## *Capture Analytics*

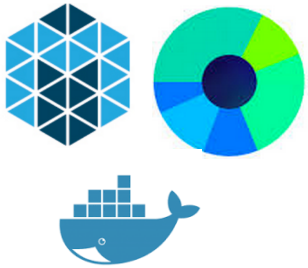
```
# verify that the Graphite instance is up by accessing it through the API Gateway
curl "http://api-gateway-graphite.${API_DOMAIN}/render/?
from=-5min&format=raw&target=carbon.aggregator.*.metricsReceived"
# to open Graphite in a browser
python -mwebbrowser "http://api-gateway-graphite.${API_DOMAIN}/"

# generate traffic for the hello-world service in order to capture metrics
docker run jordi/ab ab -k -n 10000 -c 500 "http://hello-world.${API_DOMAIN}/hello?api_key=key-1"

# then check the Graphite stats in the browser
python -mwebbrowser "http://api-gateway-graphite.${API_DOMAIN}/render/?
from=-15min&format=png&target=stats_counts.publisher.*.consumer.demo-
consumer.application.app-1.service.hello-world.sandbox.region.undefined.request.hello.GET.
200.count"
```



# #DEMO
# Apache Mesos & Microservices

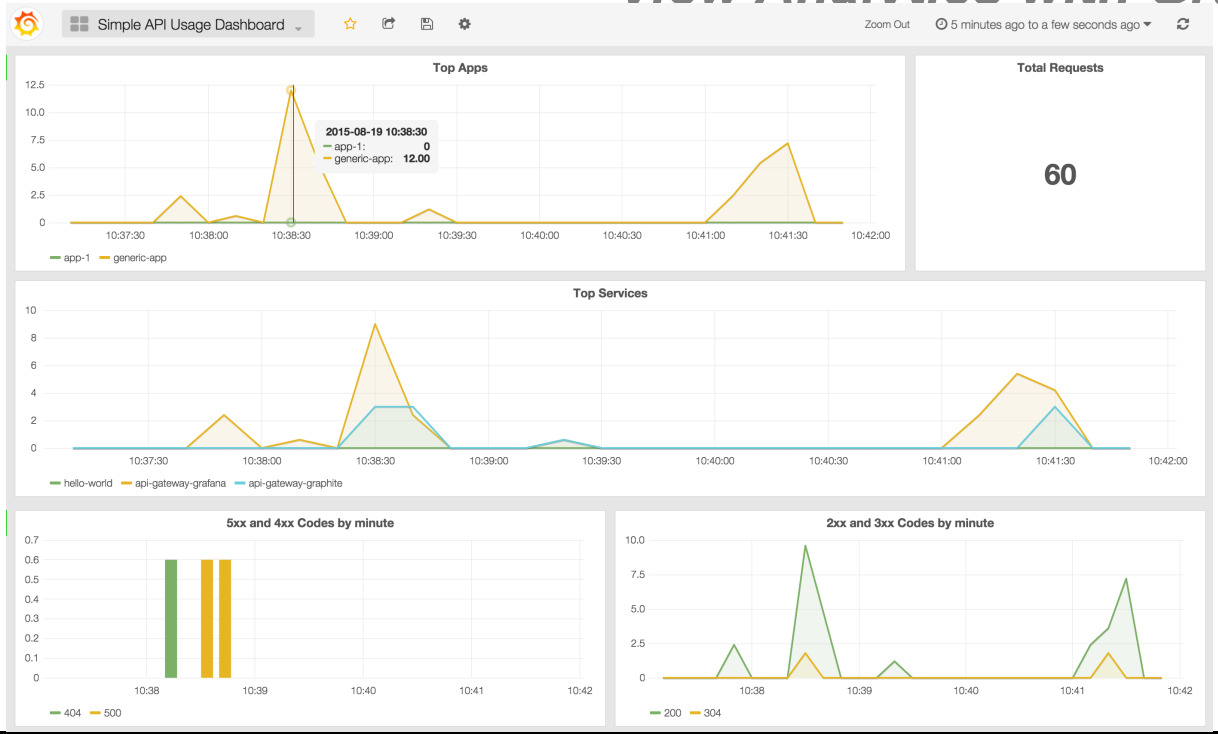
## *THE "TRAFFIC CTRL" : API GATEWAY*
## *View Analytics with Grafana*

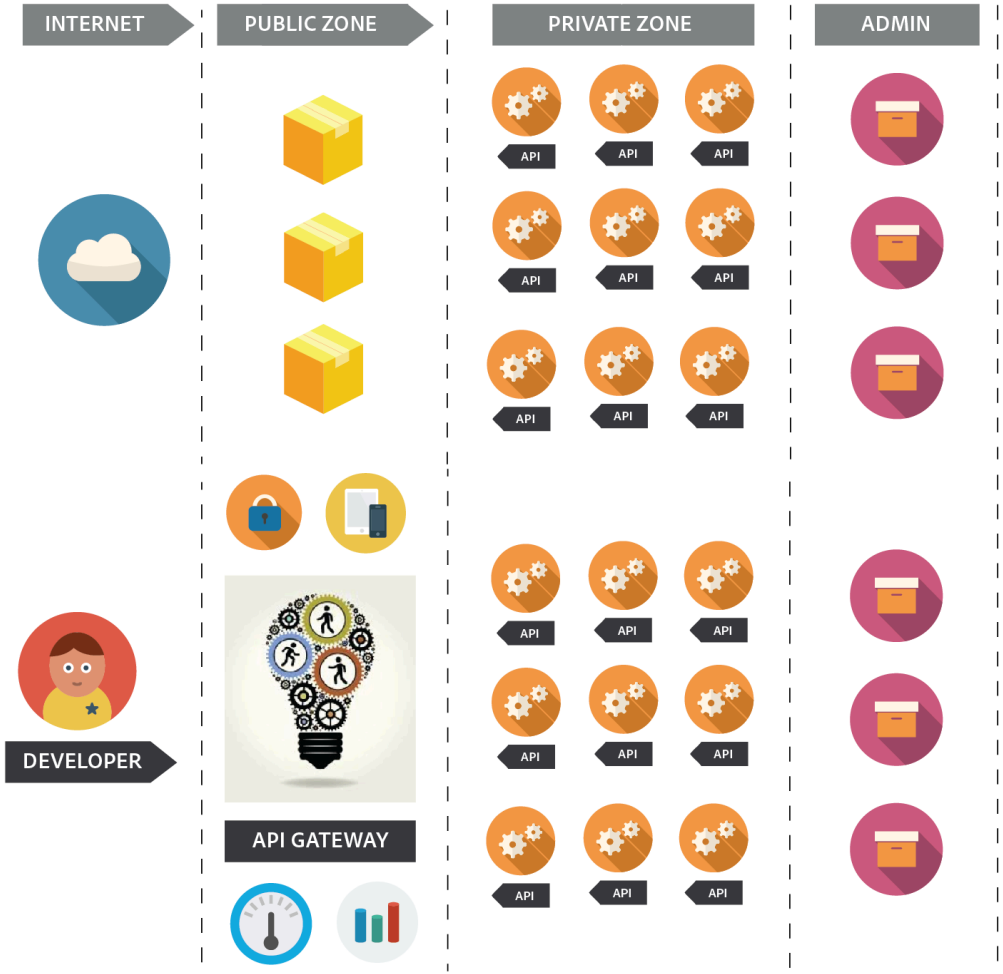
```
curl -X POST -H "Content-Type:application/json" ${MARATHON_HOST}/v2/apps?force=true --
data '
{
  "id": "api-gateway-grafana",
  "container": {
    "type": "DOCKER",
    "docker": {
      "image": "grafana/grafana:latest",
      "forcePullImage": true,
      "network": "BRIDGE",
      "portMappings": [ { "containerPort": 3000, "hostPort": 0, "protocol": "tcp" } ]
    }
  },
  "cpus": 1,
  "mem": 2048.0,
  "instances": 1
}'
```



# #DEMO
# Apache Mesos & Microservices

## *THE "TRAFFIC CTRL" : API GATEWAY*
## *View Analytics with Grafana*




INTERNET
PUBLIC ZONE
PRIVATE ZONE
ADMIN
API
DEVELOPER
API GATEWAY

API Gateway is Open Source
https://github.com/adobe-apiplatform/apigateway

Gist script used in this presentation:
https://gist.github.com/ddragosd/608bf8d3d13e3f688874