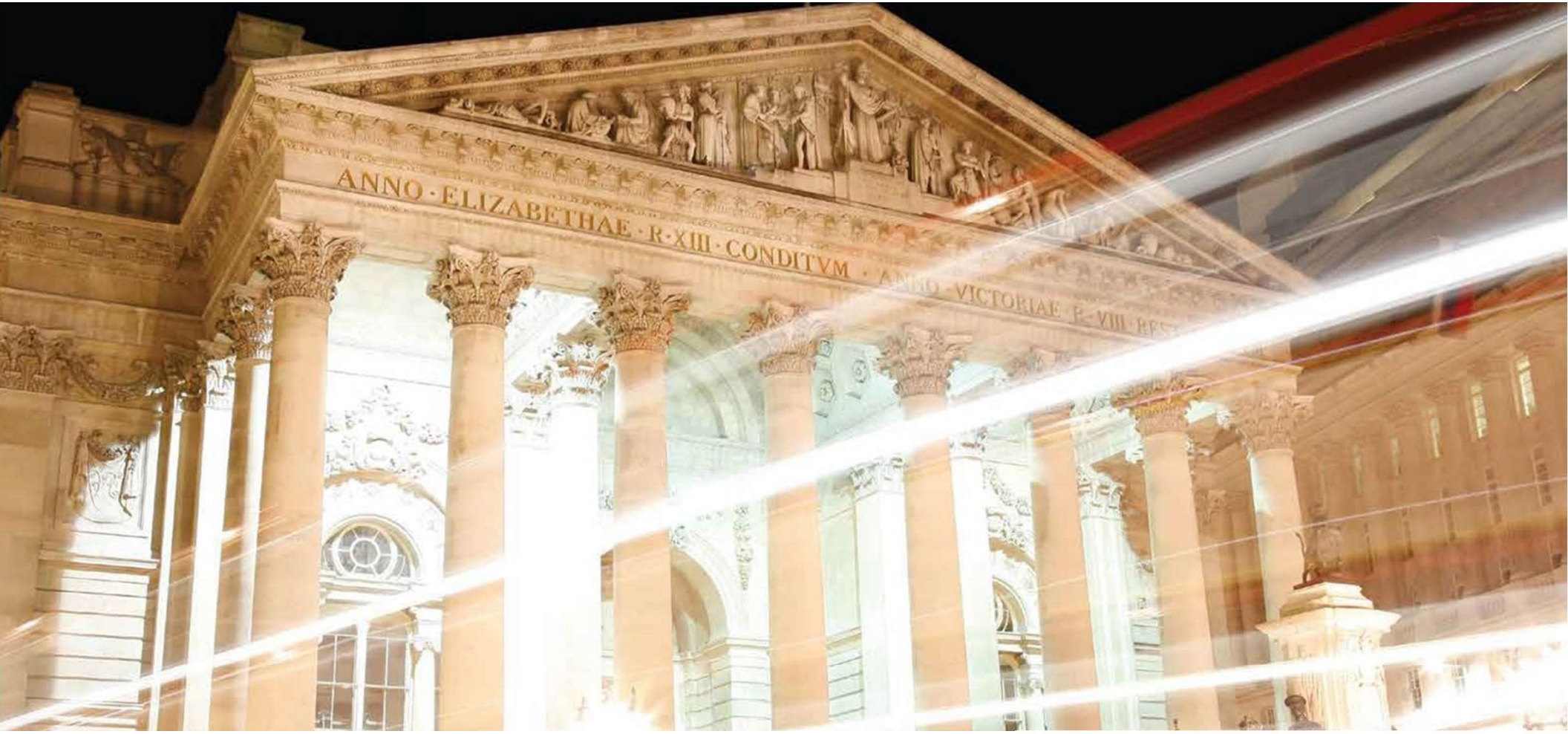


Kubernetes in Production

Project Agora

Laissez Faire Advertising

Kubernetes in Production

Damianos Damianidis

Stamatis Panorgios

Welcome to Project Agora

What is Project Agora?

Project Agora is a multi awarded, VC backed brand-safe, audience-driven marketplace with inventory from top premium local publishers that is based on the principles of real time advertising.

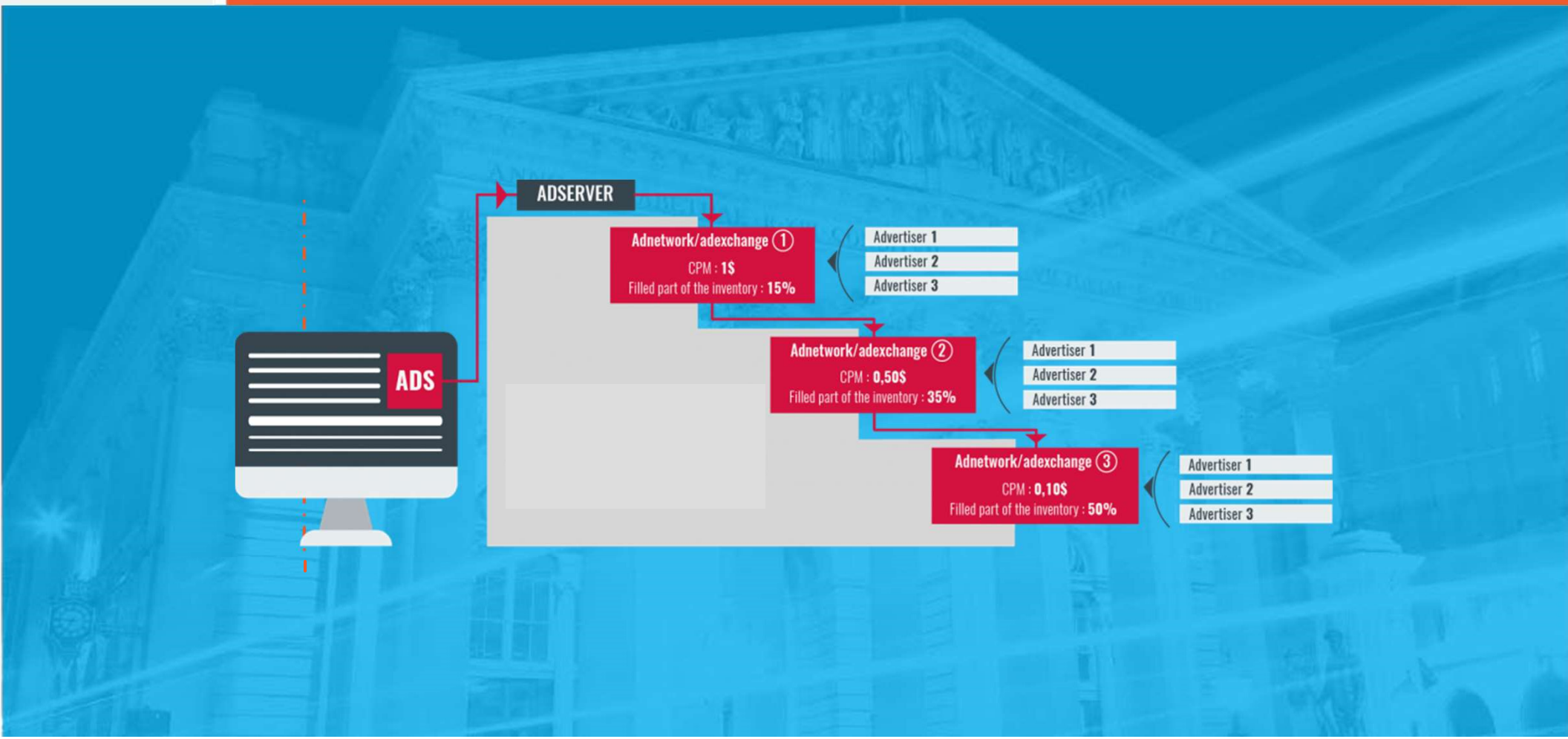
A bold Mission

A brand-safe advertising marketplace with inventory from top premium local publishers that is based on the principles of real time advertising.

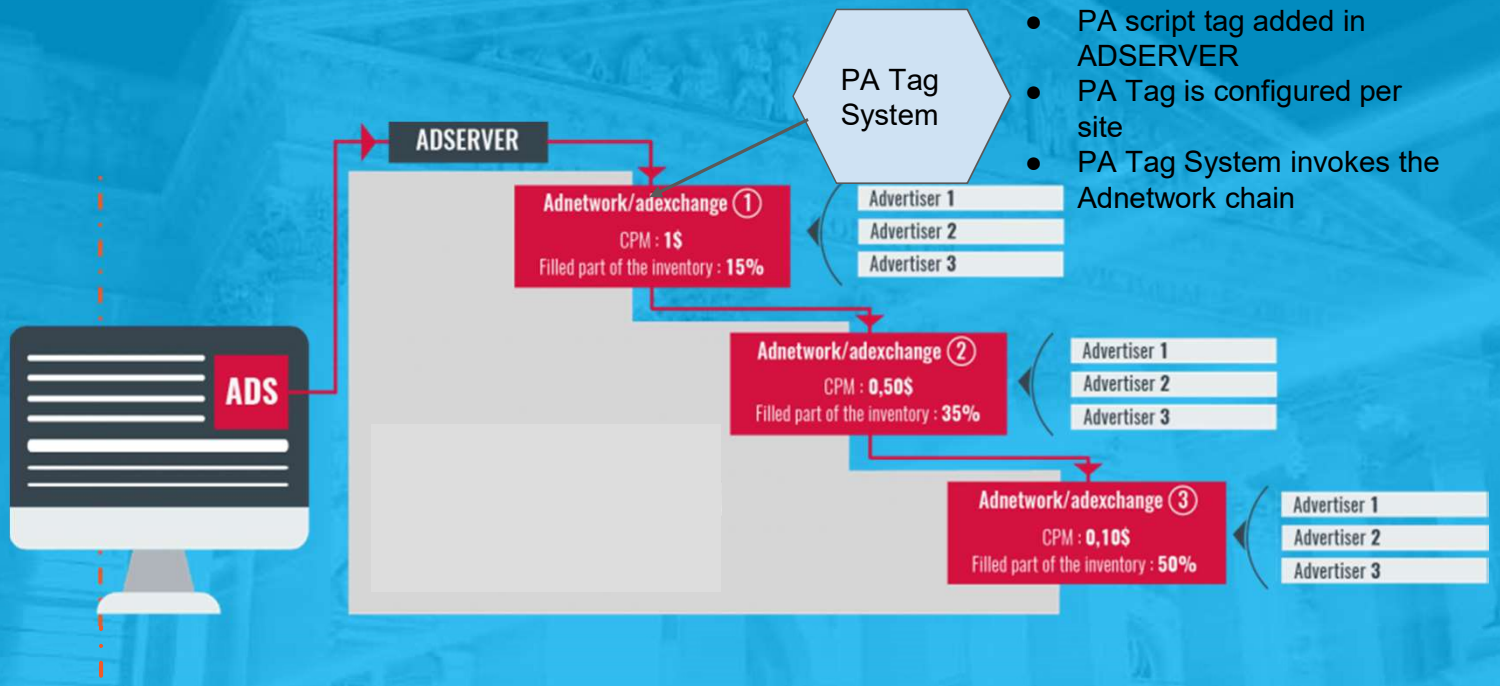
Project Agora | What's in it for me?

#1 Brand Safety
#2 Sharp Audience Targeting
#3 Creative Impact
#4 Performance across Funnel

Project Agora | Ad Waterfall



Project Agora | Ad Waterfall

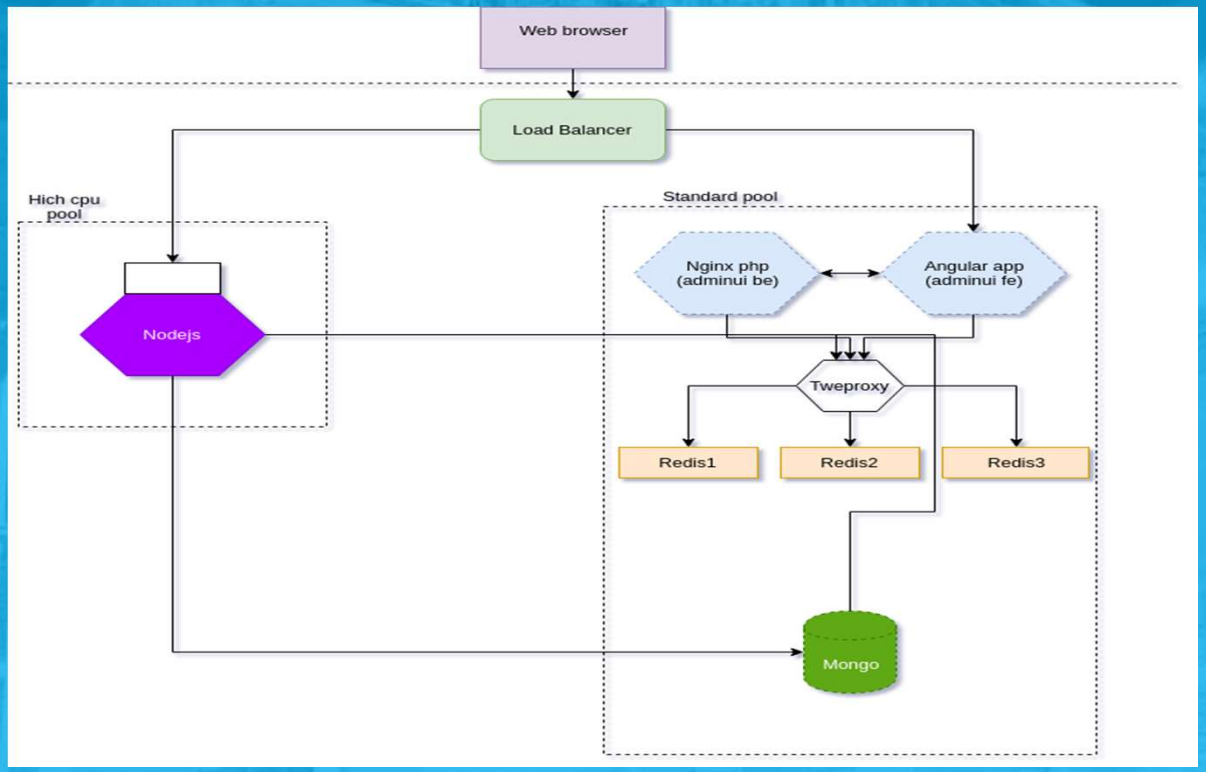


- PA script tag added in ADSERVER
- PA Tag is configured per site
- PA Tag System invokes the Adnetwork chain

PA Tag Application | Specifications

#1 Served Impressions 40M -200M per month
#2 Time To First Byte (TTFB) Response < 300 msec
#3 Cost for system services < 1500euro per month
#4 Service Layer Agreement (SLA) < 1day

PA Tag Application | Architecture



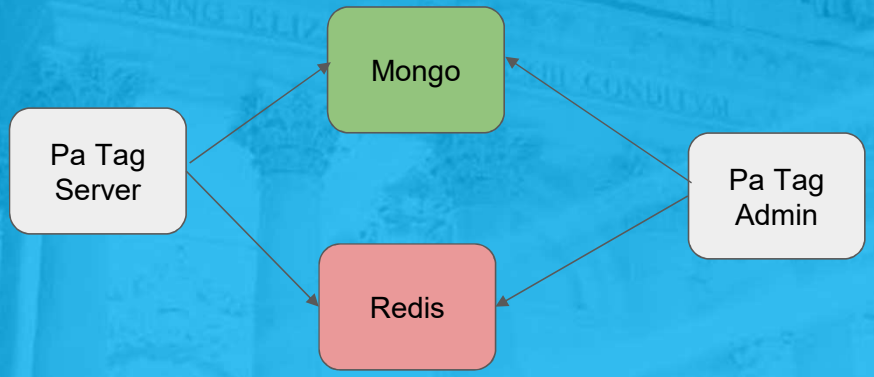
PA Tag Application | Architecture

- #1 Loadbalancer: Default Ingress Controller of
  #2 GCP Kubernetes Platform
- #3 Two (2) Node Pools
  - - Standard CPU: 1 vCPU, 3.75 GB memory
  - - high2cpu-cores: 2 vCPU's/multithreading, 1.8 GB memory)
- #4 PA Tag serving component: NodeJs
- #5 PA Tag Admin BE: Nginx/php
- #6 PA Tag Admin FE: AngularJS
- #7 Data: Redis/Mongo

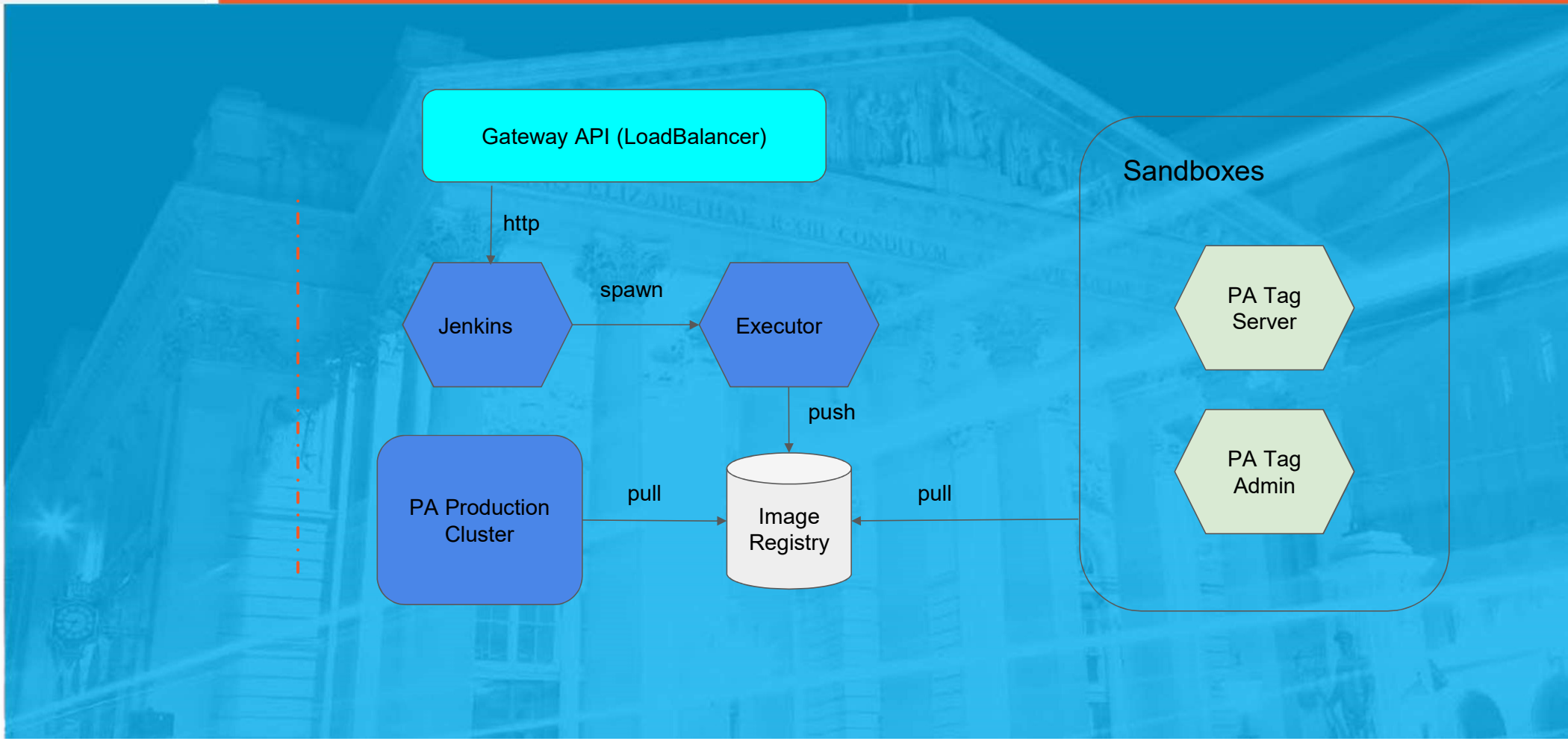
PA Tag Application | Microservices

- #1 API Gateway: Loadbalancer
- #2 PA Tag server
  - - NodeJs
- #3 PA Tag Admin:
    - - AngularJS
    - - Nginx
    - - php
- #4 Cache Layer
    - - Redis Cluster / twemproxy / 3 stateful redis instances
- #5 Database: Mongo

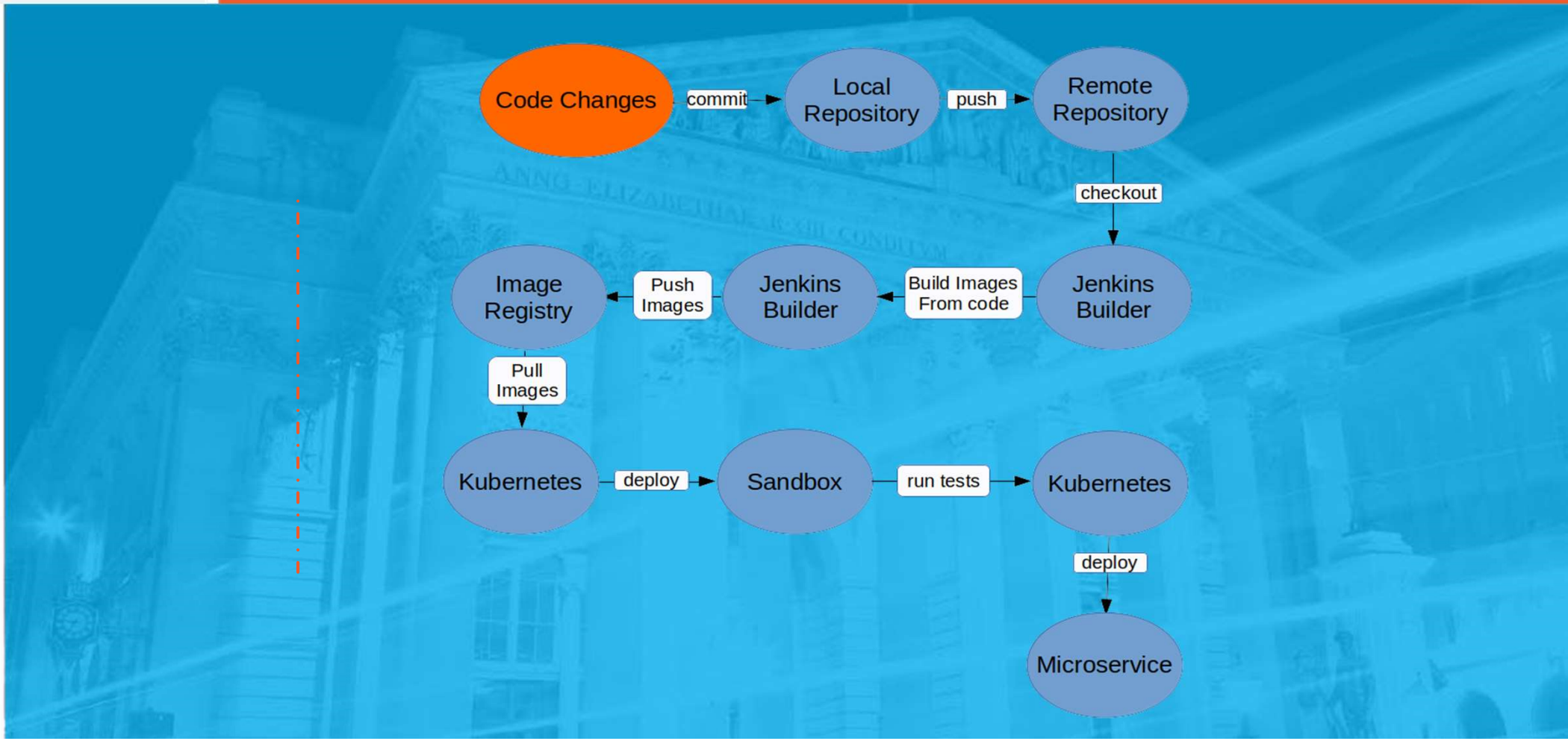
PA Tag Application | Microservices Interconnections



PA Tag Application | Testing Cluster



PA Tag Application | Deployment Flow



PA Tag Application | Staging Clusters

#1 A developer asks for a staging cluster similar to production
#2 The DevOps Team raises the cluster with terraform/bash scripts
#3 Ad server project is deployed with a bash script for developing purposes
#4 The developer can work on the staging cluster
#5 Merge commits, CI-CD with Jenkins

PA Tag Application | Performance Testing

#1 Ansible

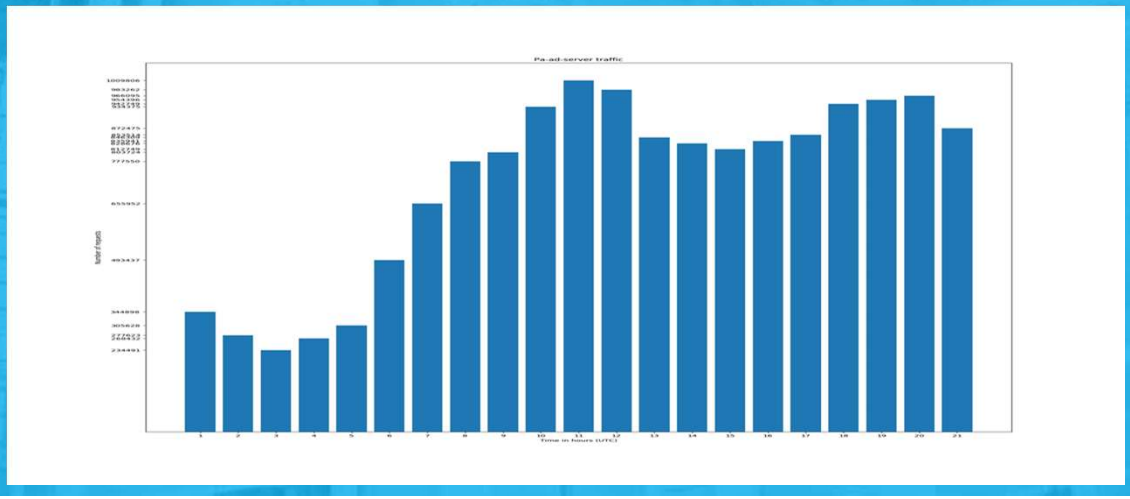
#2 Terraform

#3 Locust

#4 Python scripts

PA Tag Application | Monitoring/Logging

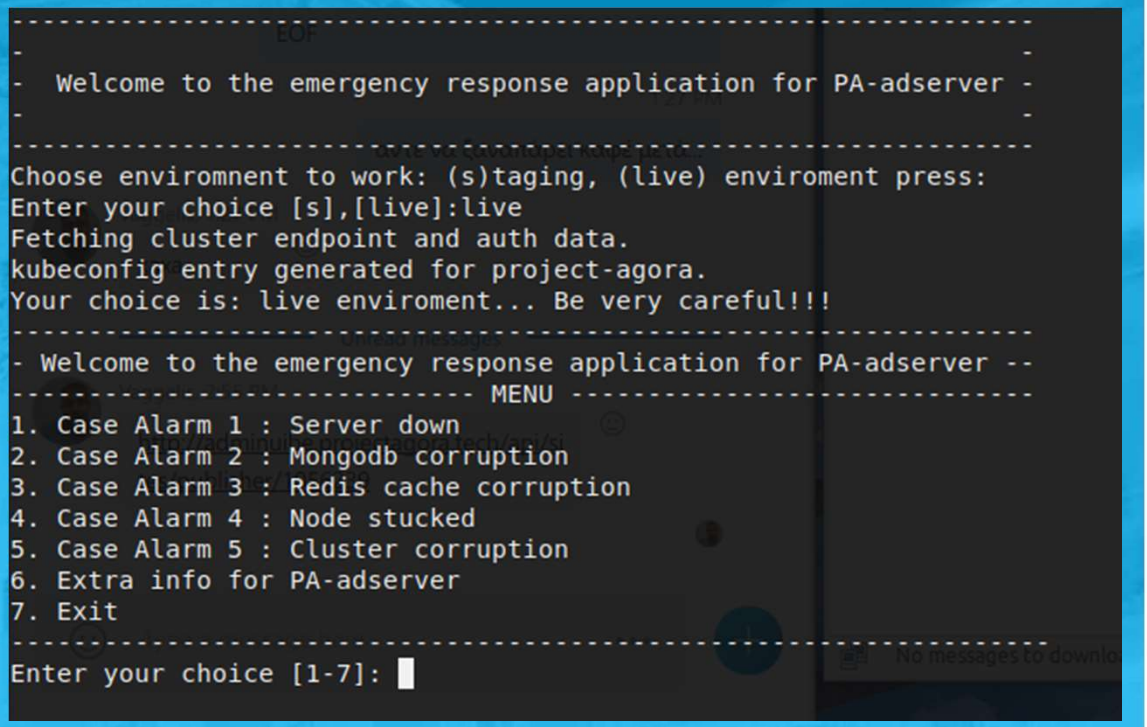
#1 Stackdriver DashBoards for nodes metrics (cpu - memory -disk)
#2 Stackdriver HealthChecks (alert when down > 5 mins)
#3 Stackdriver Logging
#4 Custom Notifications with emails



PA Tag Application | Emergency System

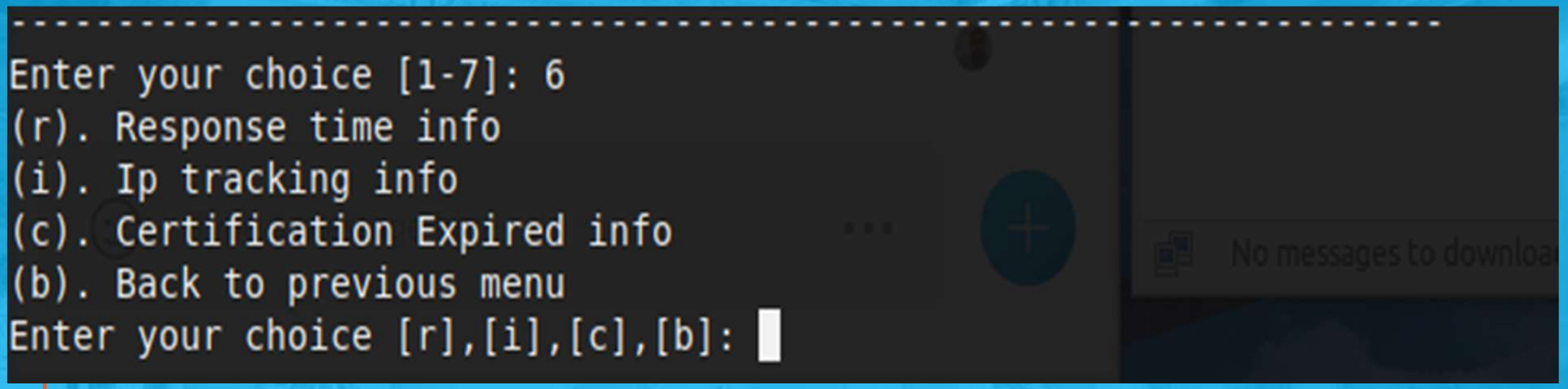
USE CASES:

- UC1: PA Tag Server down
- UC2: Database corruption
- UC3: Cache corruption
- UC4: Cluster node crash
- UC5: Cluster crash
- UC6: Deployment failure



PA Tag Application | Emergency System

Extra info:



PA Tag Application | Provisioning/Configuration

Tools we use:
#1 Ansible
#2 Terraform
#3 Bash/Python Scripts

PA Tag Application | Provisioning/Configuration

#1 Ansible
Temporarily connect remotely via SSH to do its tasks

#2 Terraform
Connect with cloud providers to do its tasks

PA Tag Application | Terraform Use Cases

#1 Provision Cluster with specific nodes (production)

#2 Create Staging Environments (per project)

#3 Rebuild Ad-Server Cluster as an emergency use case

#4 Provision virtual machines for Ad-Server loading tests

PA Tag Application | Ansible Use Cases

#1 Provision virtual machines for Ad-Server loading tests

#2 Provision emergency application virtual machine

#3 Provision linux containers (lxc)

PA Tag Application | Microservices Pros/Cons

Pros

#1 Every microservice is a product feature or sub-feature
#2 Has its own code repository / independent development
#3 Can be developed, tested, deployed and maintained autonomously by small team
#4 Can be used in different languages, frameworks, technologies for every microservice

Cons

#1 Increased complexity of the whole system
#2 Additional tools/framework for inter-service communication
#3 Increased complexity of the debugging/monitoring of the whole application

PA Tag Application | Kubernetes Costs

#1 Credits for start up

#2 Pay per use

#3 Techniques for decreasing cost

#4 Up/Down Staging Cluster - Scaling microservices

#5 Use preemptible virtual machines whenever possible

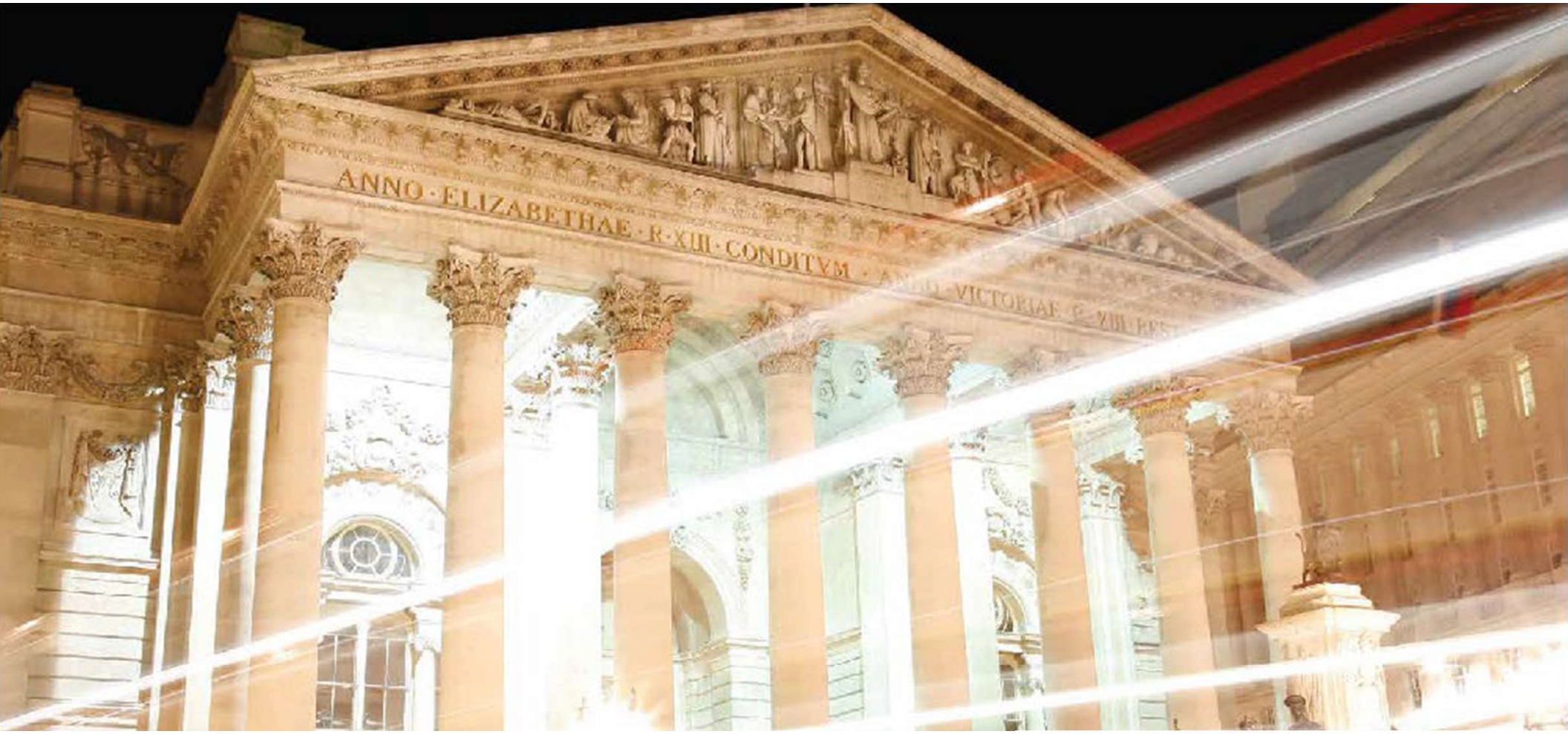
PA Tag Application | Next Steps

#1 Implement Istio Service Mesh/Event Mesh solution

#2 Implement Kiali, Prometheus, Grafana, Jaeger

#3 Implement API Gateway

#4 Implement Reverse Proxy



Thank you!

Project Agora

Laissez Faire Advertising