Build Your Next App with Serverless Architecture

Shekhar Gulati
Xebia

About Me

- Director Technology @ Xebia
- Previously Technology Evangelist @ Red Hat
- Author and Blogger

Xebia

What is Serverless?

Xebia

Hmm.. So, there are no servers..

Xebia

Serverless does not mean there are no servers, it only means you don’t have to think about them.

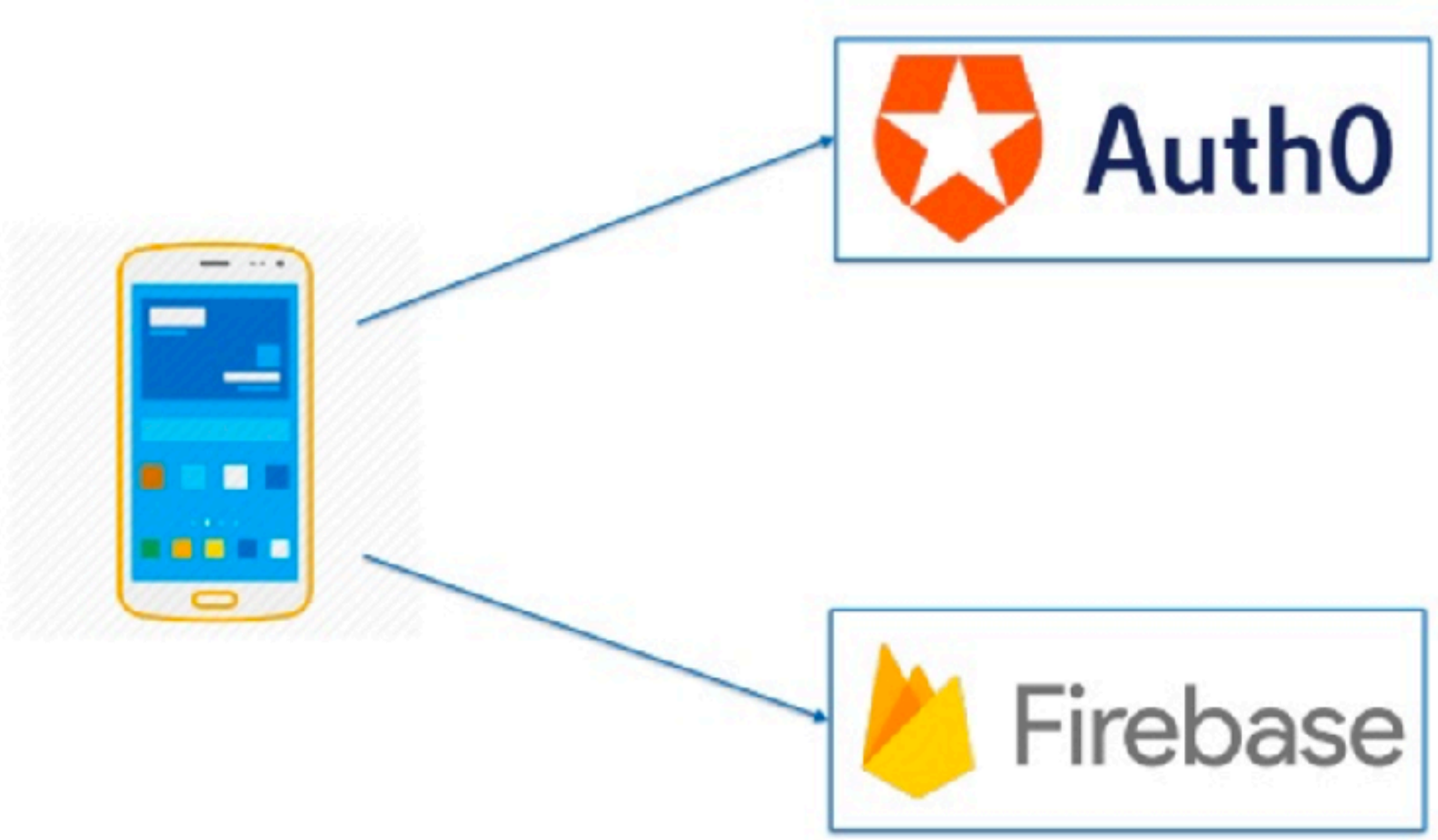
Xebia

Serverless is an overloaded word

Backend-as-a-service

Initially, it described applications that were built using fully managed services or Backend-as-a-service(or BaaS).

Mobile Backend-as-a-service Example

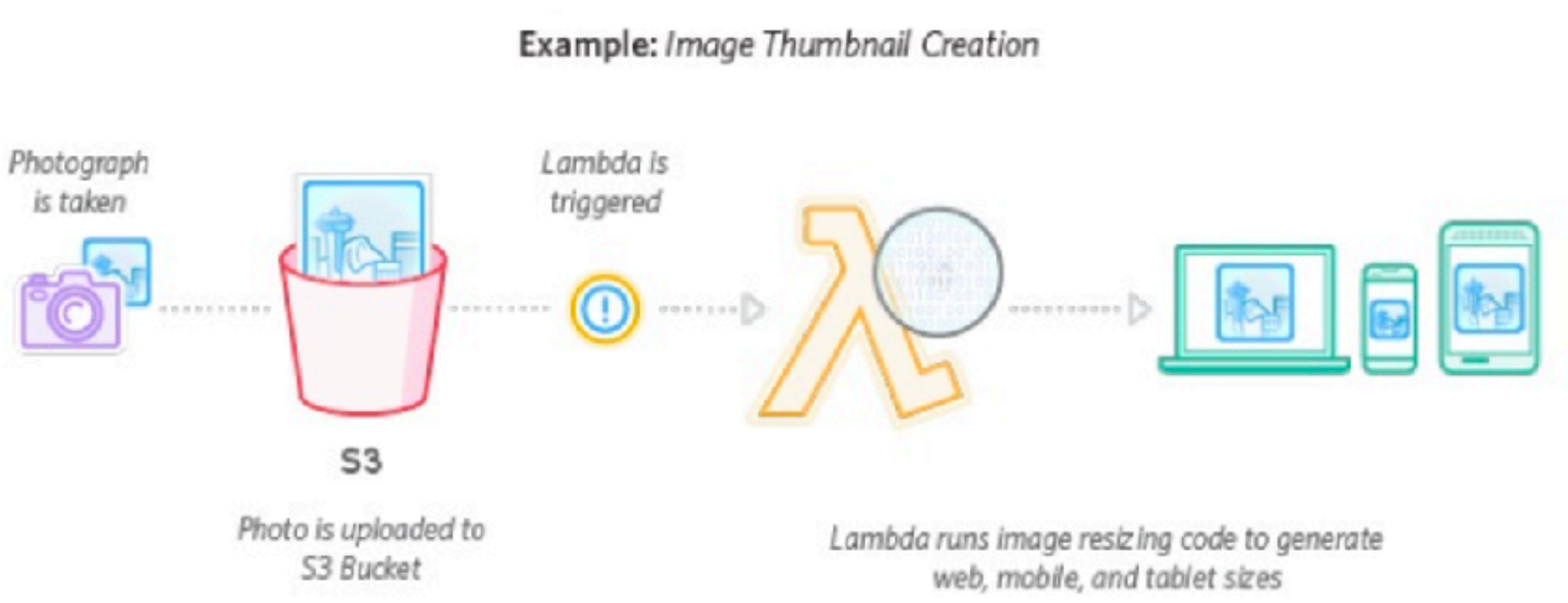


Function-as-a-service

The 2016-* definition of Serverless is about building applications where custom code runs in stateless compute containers that are event-triggered, ephemeral, and fully managed by cloud provider.

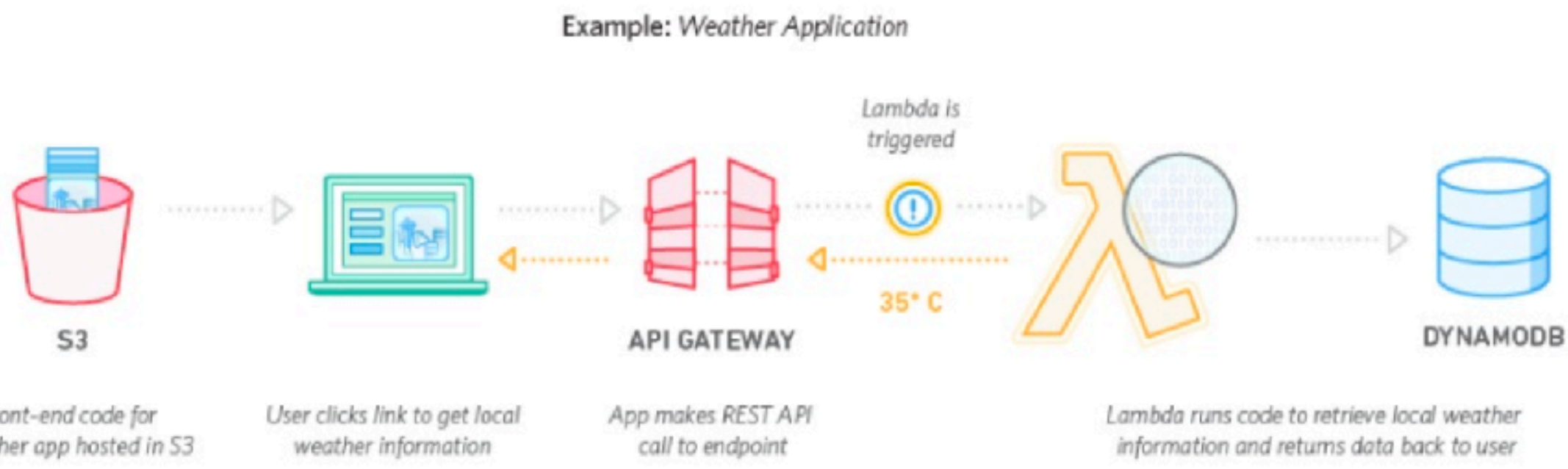
FaaS goes against traditional **always on** server.

Function-as-a-service Example



Xebia

Function-as-a-service Example



Serverless Google Trends

Xebia

Serverless solutions

- AWS Lambda
- Google Cloud Functions
- MicroSoft Azure Functions
- Open source
  - Apache OpenWhisk (backed by IBM)
  - Fission
  - faas

AWS Lambda Demo

Xebia

What makes Serverless different?

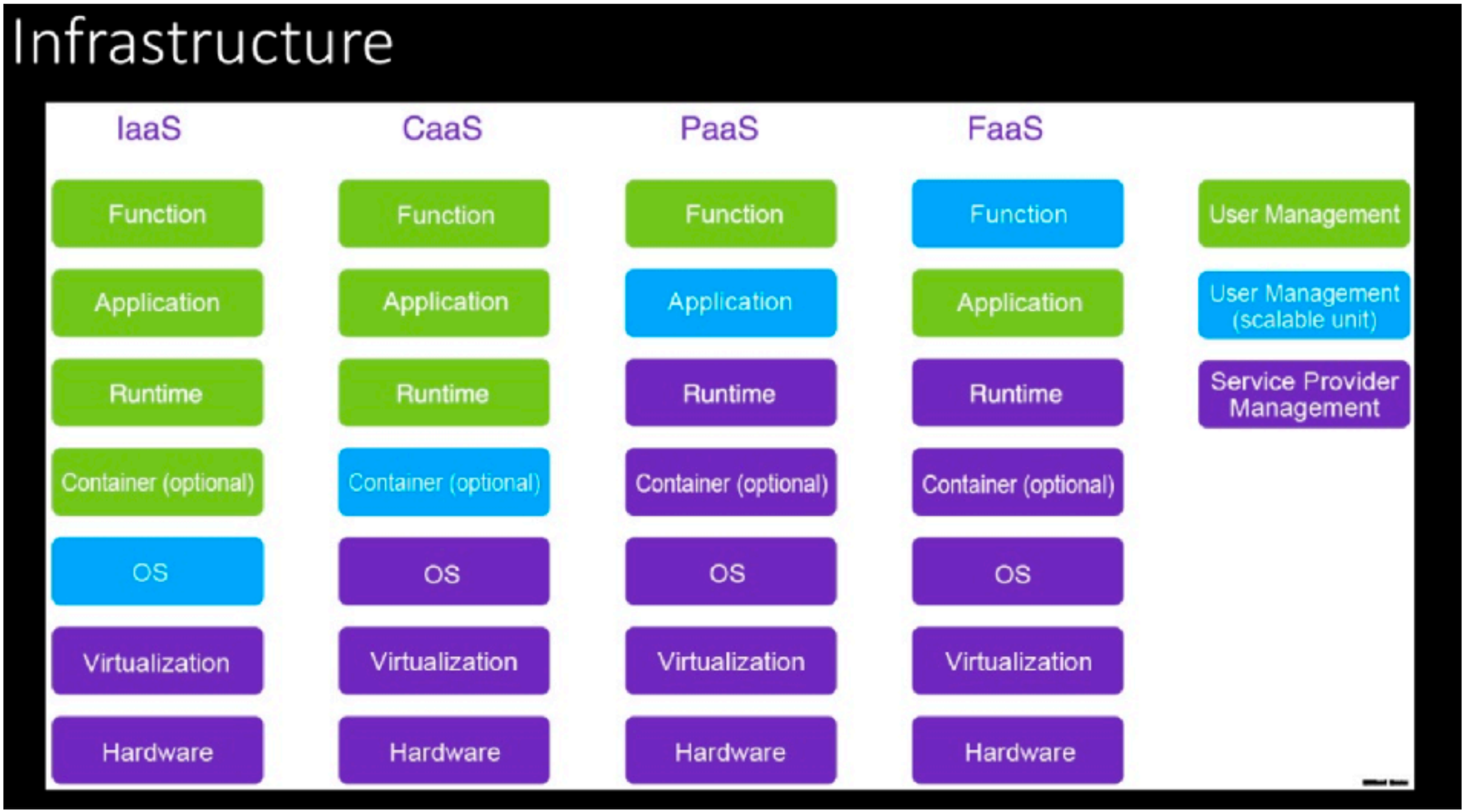
Xebia

Serverless is different:

- You don’t write server applications or manage server systems
- Simplified deployment model as no server applications are involved.
  - Just upload the code to the provider
- Serverless is a natural fit for building applications that follow event-driven Microservice architecture
- Gives complete independence from underlying infrastructure management
- Enables horizontal scalability at function level without any human intervention or upfront planning
- Your code is execute in response to an event triggered by event types defined by the provider

Isn’t cloud computing made us think less about servers?

Xebia


Infrastructure
IaaS
CaaS
PaaS
FaaS
Function
Function
Function
Function
User Management
Application
Application
Application
Application
User Management (scalable unit)
Runtime
Runtime
Runtime
Runtime
Service Provider Management
Container (optional)
Container (optional)
Container (optional)
Container (optional)
OS
OS
OS
OS
Virtualization
Virtualization
Virtualization
Virtualization
Hardware
Hardware
Hardware
Hardware

Xebia

Infrastructure-as-a-service

- Made it easy to spin up new servers with API calls
- You own the server and can do anything with it.
- You pay by hour
- But, you still have to manage servers. You still own them.
- Virtual machines are long lived.

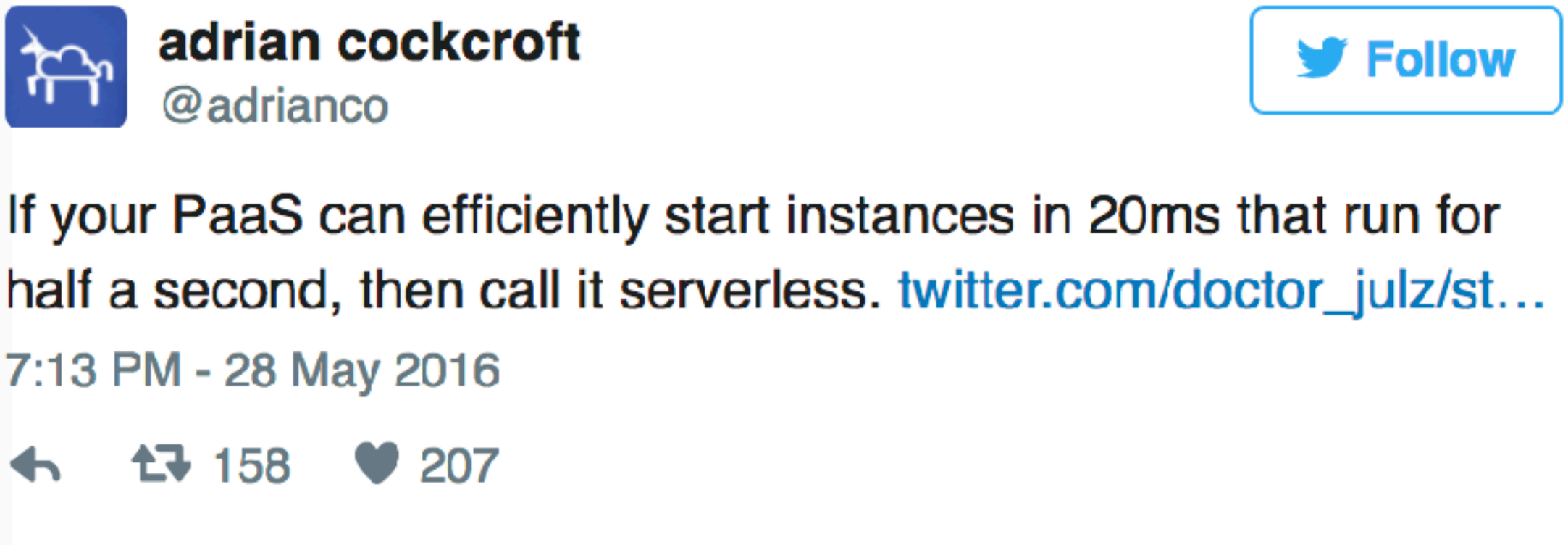
Platform-as-a-service

- You don’t have to care about provisioning and managing servers.
- Bring your app(with customisations) and run on a platform.
- Allowed cloud providers to efficiently use virtual machines.
- Gave us managed software services — Heroku PostgreSQL
- You still have a running server
- Each PaaS put some constraints on what you can and can not do.
- You still have to think about scaling. Most PaaS are not good at auto-scaling.

Serverless Benefits

Xebia

PaaS vs FaaS



PaaS applications are not geared towards bringing entire applications up and down for every request.

Xebia

Benefits

- Reduce operational costs
  - Pay only for code execution time
  - Small focussed functional teams
- Reduce development cost
  - Write only business code
  - Use third party managed services
- Easier operational management
  - Auto Scaling
  - No patching or infrastructure management

What are Serverless drawbacks?

Drawbacks

- Vendor lock-in
- Startup latency
  - 3 second for JVM
- Integration and functional testing is hard
- Function sprawl

Serverless use cases

- Social campaigns
- Stream processing
- File processing
- ETL jobs
- IoT backends
- Webhook backend
- ChatOps

Serverless framework

Open-source application framework to easily build serverless architectures on different cloud providers.

Xebia

Serverless framework demo

Xebia

Xebia's Coding Interview Automation System

https://github.com/xebiaww/lambda-coding-round-evaluator

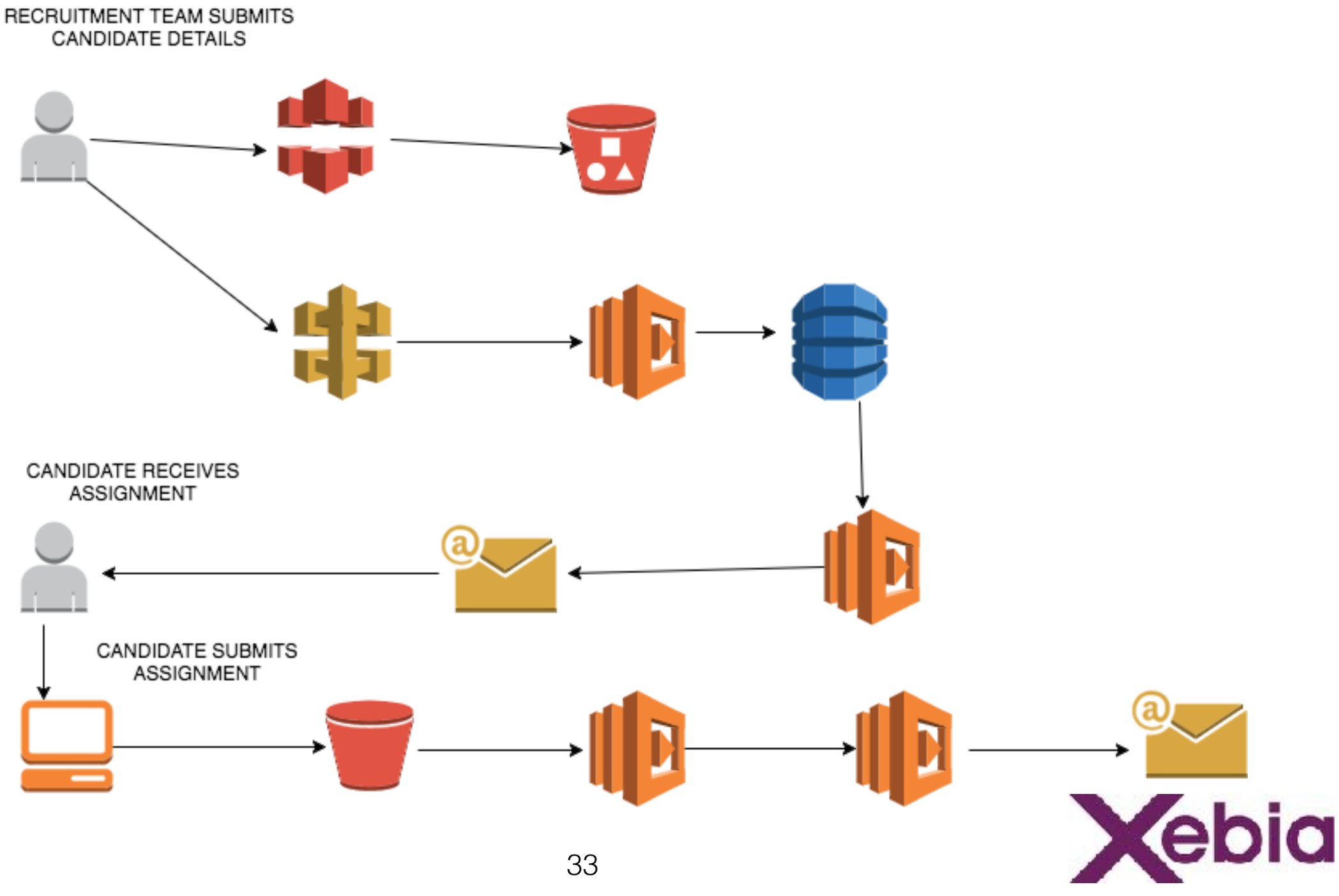
Xebia

Automating interview process

- Evaluate coding assignment automatically
    - Recruitment team submits candidate details
    - Based on candidate details, an email is sent to the candidate with assignment
    - Candidate submit assignment using a build tool like **gradle submitAssignment**
    - Applications runs the build, calculate code coverage, and run automated test cases
    - If candidate passes a threshold score then moved to next round
    - Else, candidate fails the test and interview process stops

Xebia

Architecture



Tech stack

- Node.js
- Java 8
- Scala
- AWS Services: S3, Lambda, API Gateway, Cloudfront, SES, DynamoDB

Thanks -:)

https://github.com/shekhargulati/hands-on-serverless-guide

Xebia