Serverless Architecture

CSSE6400

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Oxymoron 1. Serverless

Logic running on someone else's server.

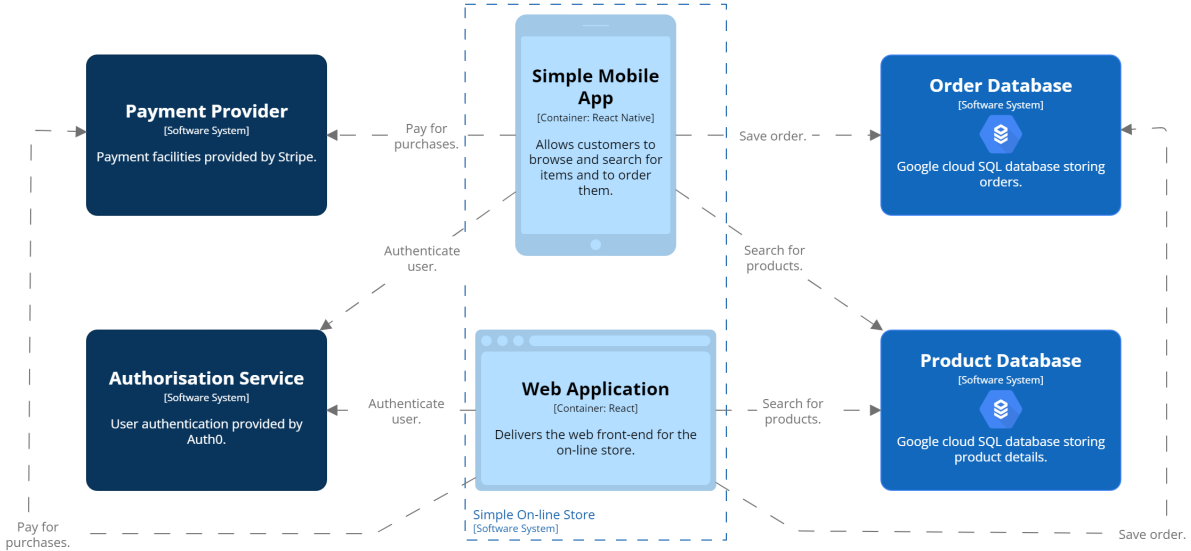
Developers can focus on logic, not infrastructure to deliver it.

Definition 1. Backend as a Service (BaaS)

Cloud-hosted applications or services that deliver functionality used by an application front-end.

- Front-end may be a SPA or mobile app.
- Back-end provides sophisticated functionality (e.g. database, machine learning, location services, authentication, …).
- Front-end ties back-end services together to deliver the application's functionality.

BaaS Example



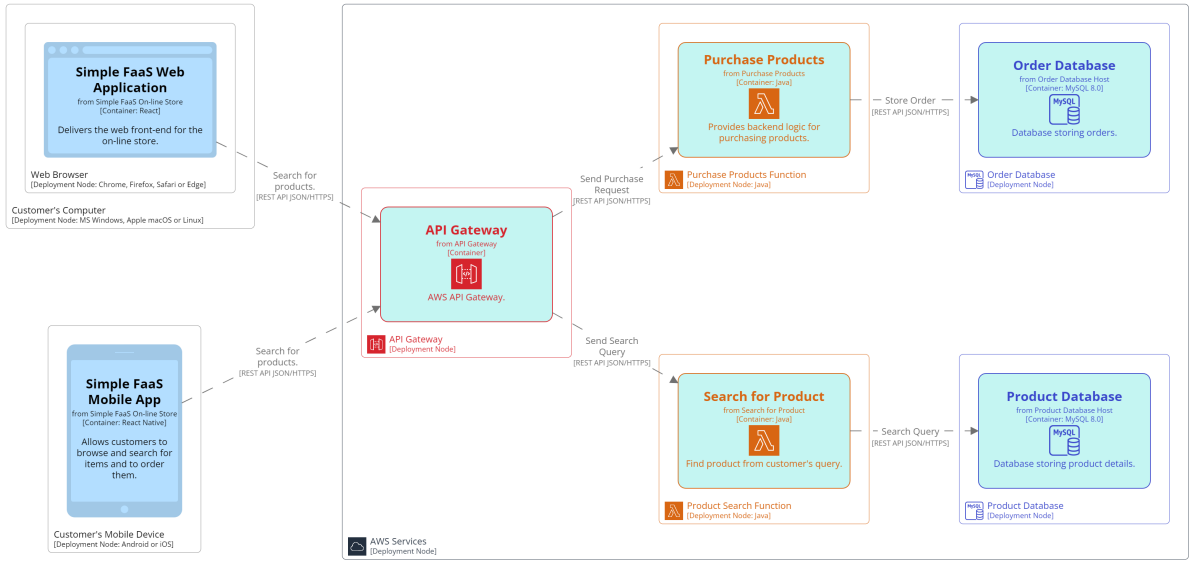
- Example of simple system with back-end functionality delivered entirely via BaaS.
- Feature-rich front-ends coordinate behaviour delivered by BaaS.
- Consequence: Front-ends are tightly coupled to BaaS.
- Consequence: Front-ends are have both UI and functional behaviour logic.
- Front-end could have a layered design, though many SPAs don't.

Definition 2. Functions as a Service (FaaS)

Application logic that is triggered by an event and runs in a transient, stateless compute node.

- Node may only exist for duration of function call.
- Server infrastructure (e.g. type of node, lifespan, scaling, …) are managed by hosting provider.
- e.g. AWS Lambda, Google App Engine, Azure Automation, ….

FaaS Example



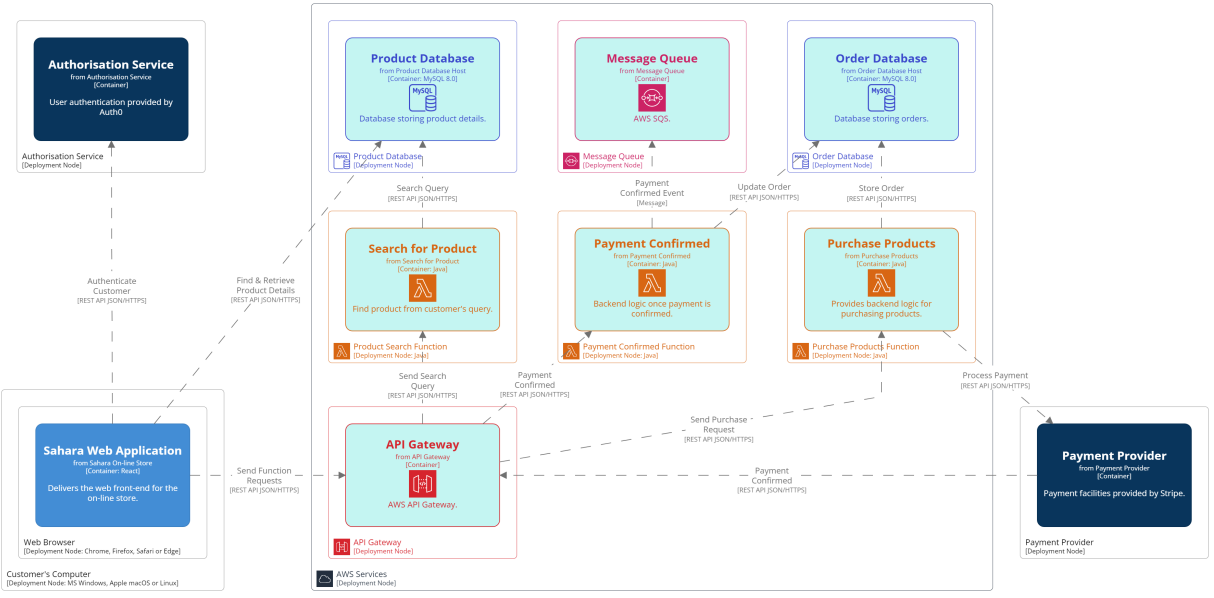
- Example of simple system with back-end functionality delivered entirely by FaaS.
- Feature-rich front-ends coordinate behaviour delivered by FaaS.
- Front-ends invoke functions via an API.
- API Gateway provides some separation between front-end and functions.
- May allow a bit more separation between UI and logic.

Definition 3. Serverless Architecture

Software system delivering functionality through BaaS or FaaS.

- Many people focus on FaaS when considering Serverless.
- Some simple Single Page Web Apps (SPA) coordinate.
- Front-end ties back-end services together to deliver the application's functionality.

Serverless Sahara eCommerce



- Sahara eCommerce example as a serverless app.
- Only browse, search and purchase are shown.
- Should mention that shopping cart is within the web or mobile app.
- Payment Confirmation event added to Queue would be picked up by a fulfillment function to pack & send order.
- Once sent, another event would trigger an ‘order sent’ function.

Oi!

Continue Sahara Example with Steps After Diagram Above

Pros & Cons

- Modularity 
- Extensibility 
- Reliability 
- Interoperability 
- Scalability 
- Security 
- Deployability 
- Testability 
- Simplicity