

ORACLE®

Cloud Native Labs



Serverless Architecture

Basic Patterns with Serverless

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#OracleCloudNative
cloudnative.oracle.com

Safe Harbor Statement

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About Me

- Oracle via Sun Microsystems
- Responsible for Docker on Solaris, later on Oracle Linux
- Some work with Open Containers and CNCF WGs
- Now a Cloud Native Advocate @ Oracle Cloud

- @jlb13 on Twitter

About OCI

- Next-generation Cloud Infrastructure
- Highly performant, very affordable
- Managed Cloud Native Services
 - OKE & OCIR at the core
 - Many managed services in the pipeline
- Check out OCI: <https://cloud.oracle.com/tryit>

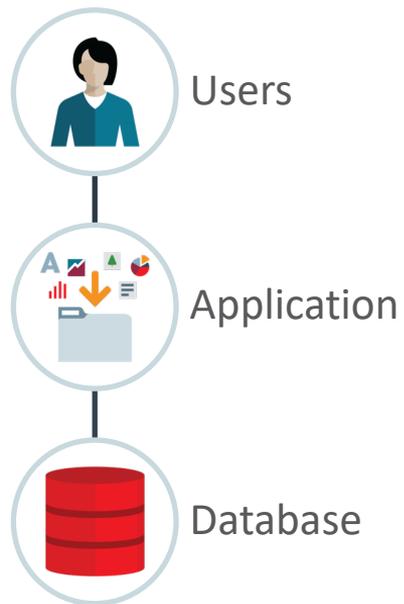
Level Set

- Serverless
- In production?
- Lambda?

Monolithic Applications

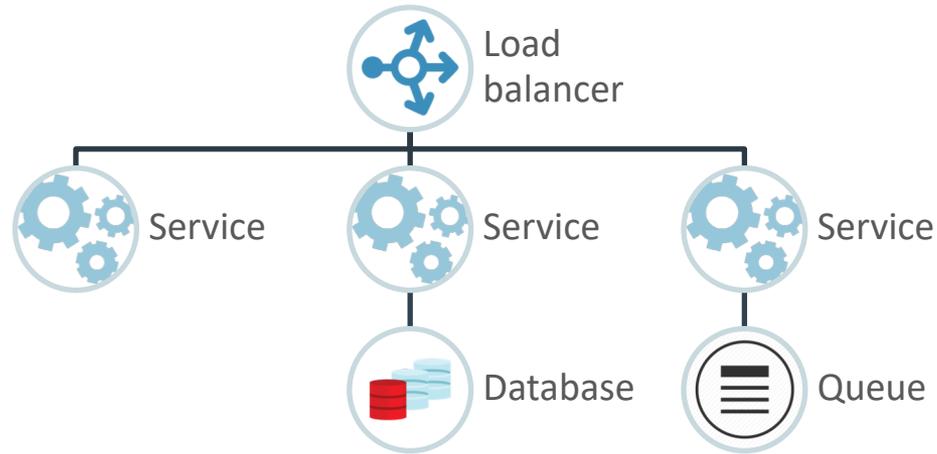


Monolithic Applications



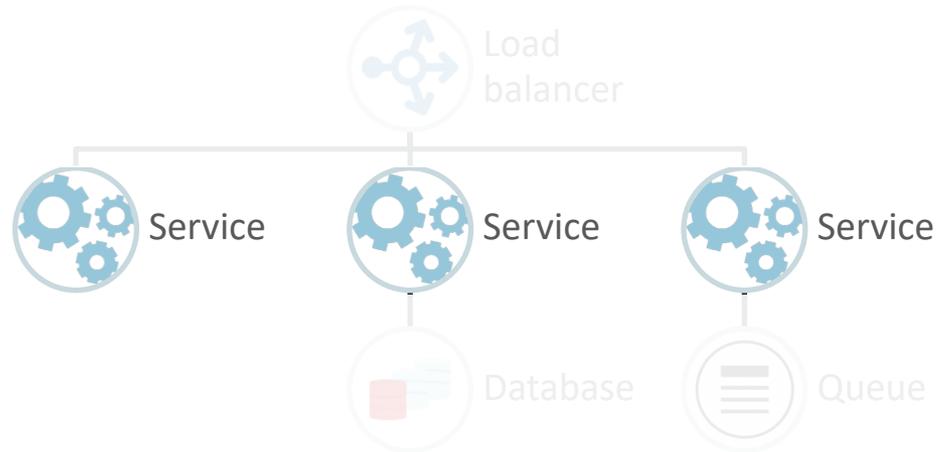
Microservices

Deploying Code to Systems We Build in the Cloud with Excellent Abstractions

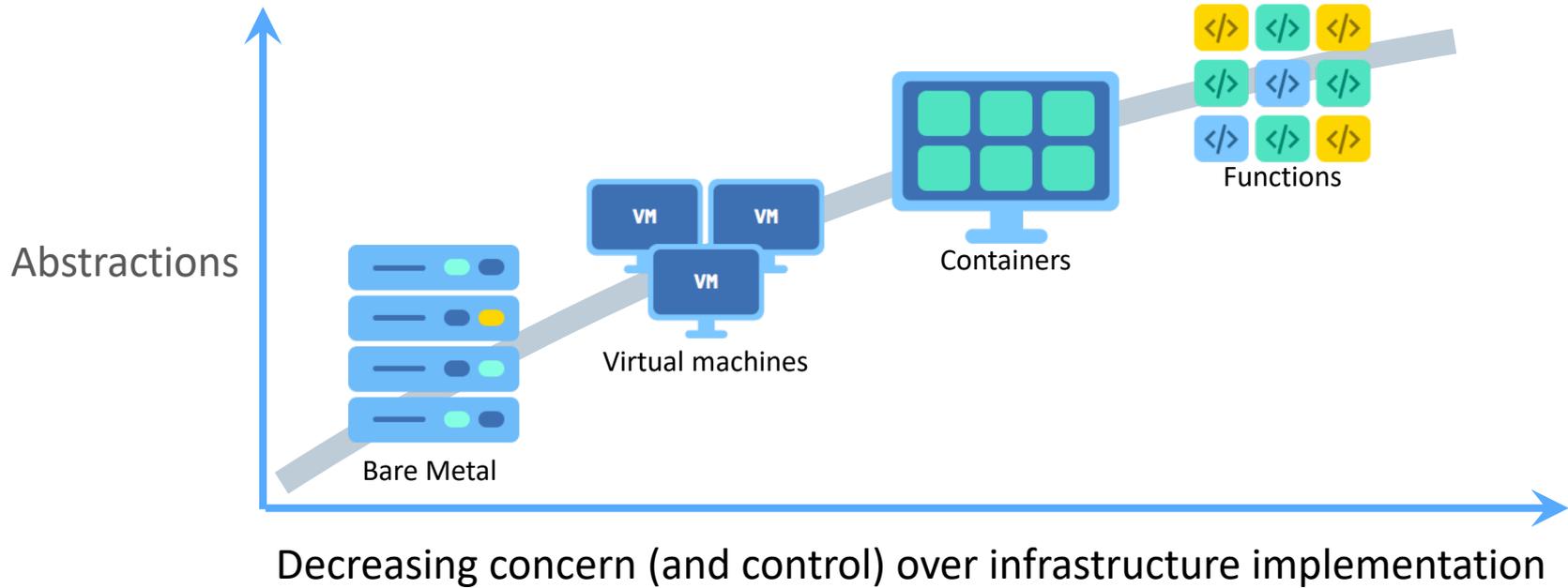


Serverless

Deploying Code to Systems We Build in the Cloud with Excellent Abstractions



Trend towards Serverless

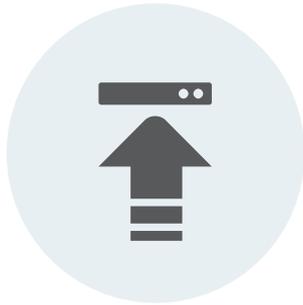


What Is Serverless?

- Event-driven architecture
- Invisible infrastructure
- Automatic scaling on demand
- Fault tolerant and highly available
- Granular billing for execution time



How Does it Work?



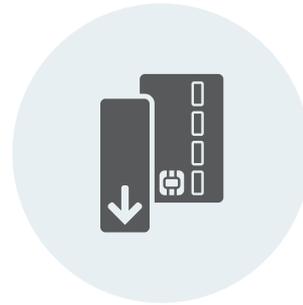
Upload
Function
Source Code



Configure
Function
Trigger



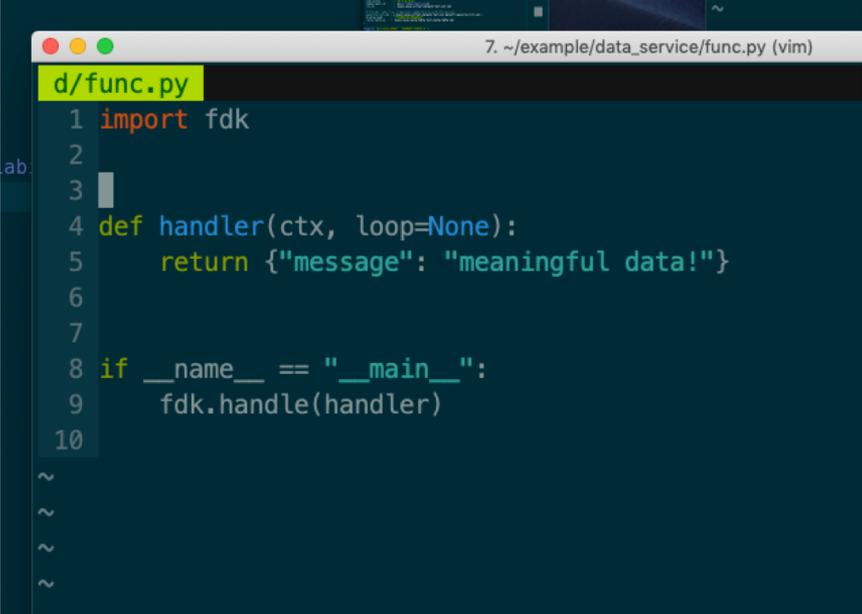
Function is
invoked
when
triggered



Pay for execution
time, not idle
time

Function Example

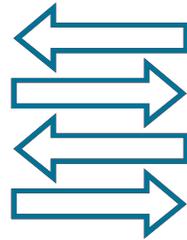
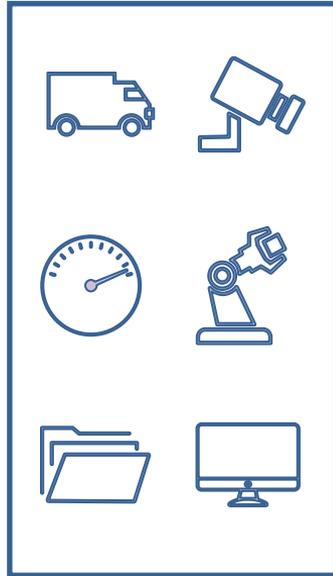
- Different projects and products differ in use and workflow
- This example function can be deployed in Oracle Functions
- Just the code, configured against any number of event triggers
- As with microservices, applications are composed of many functions

A screenshot of a code editor window titled "7. ~/example/data_service/func.py (vim)". The editor shows a Python file named "d/func.py" with the following code:

```
1 import fdk
2
3
4 def handler(ctx, loop=None):
5     return {"message": "meaningful data!"}
6
7
8 if __name__ == "__main__":
9     fdk.handle(handler)
10
```

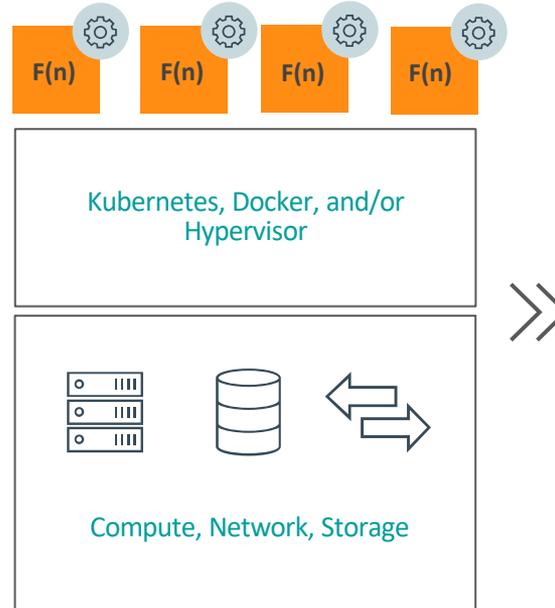
Functions-as-a-Service

Event Sources



Triggers

Function Execution



Backend Services



Oracle Functions

Oracle Functions

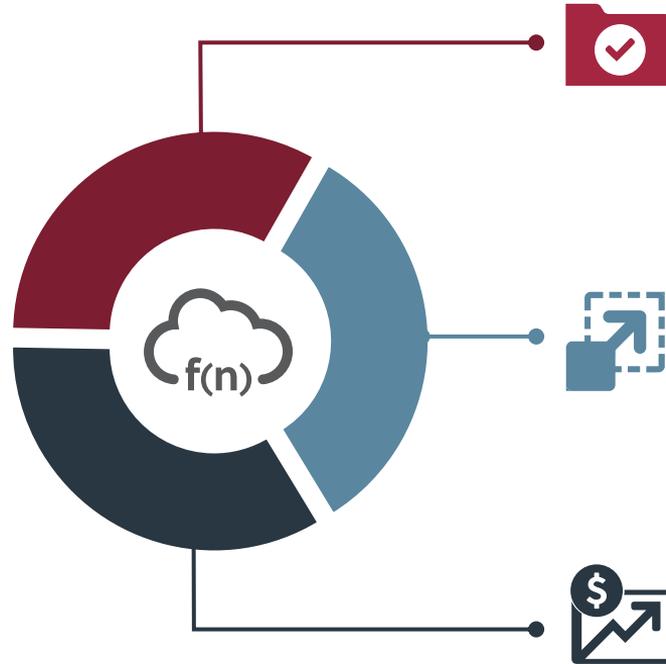
Functions-as-a-Service

Oracle Cloud
Integrated
Container Native

Open Source Engine

Multi-tenant

Secure



Pay Per Use

Pay for execution, not for idle time

Autonomous

Platform auto-scales functions
No servers to provision,
manage

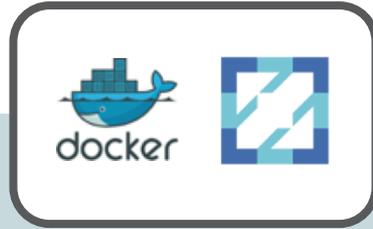
No Lock-in

Built on open-source Fn
Project and Docker

Key Features



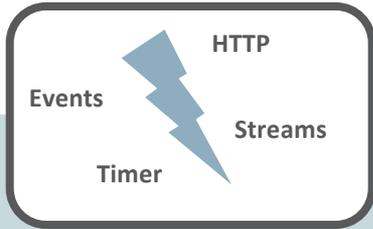
Open Source Engine



Container Native



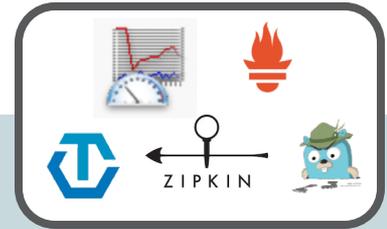
Function Dev Kits



Oracle Cloud Triggers



Fine-grained Billing



Advanced Diagnostics

Execution Model

- Synchronous
- Asynchronous
- Streaming



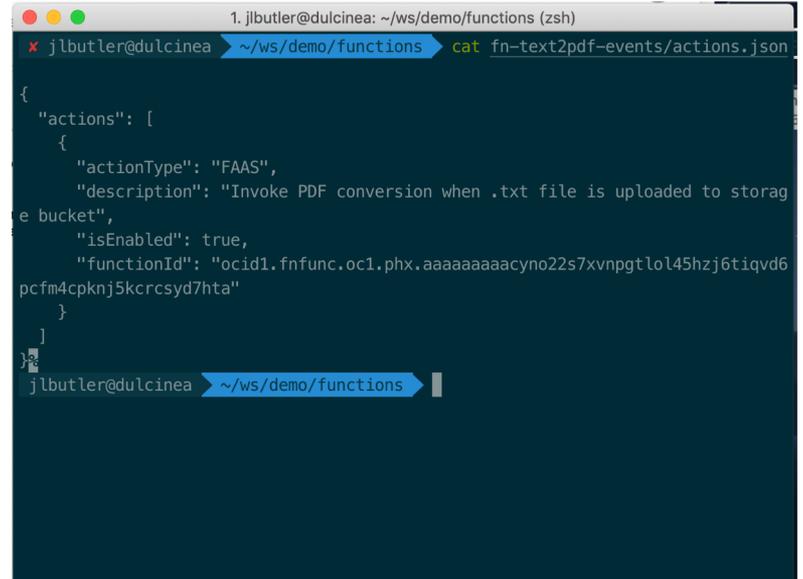
Events, Determined by Context

- Changes in data
- Requests on endpoints
- Changes in resources
- Timers



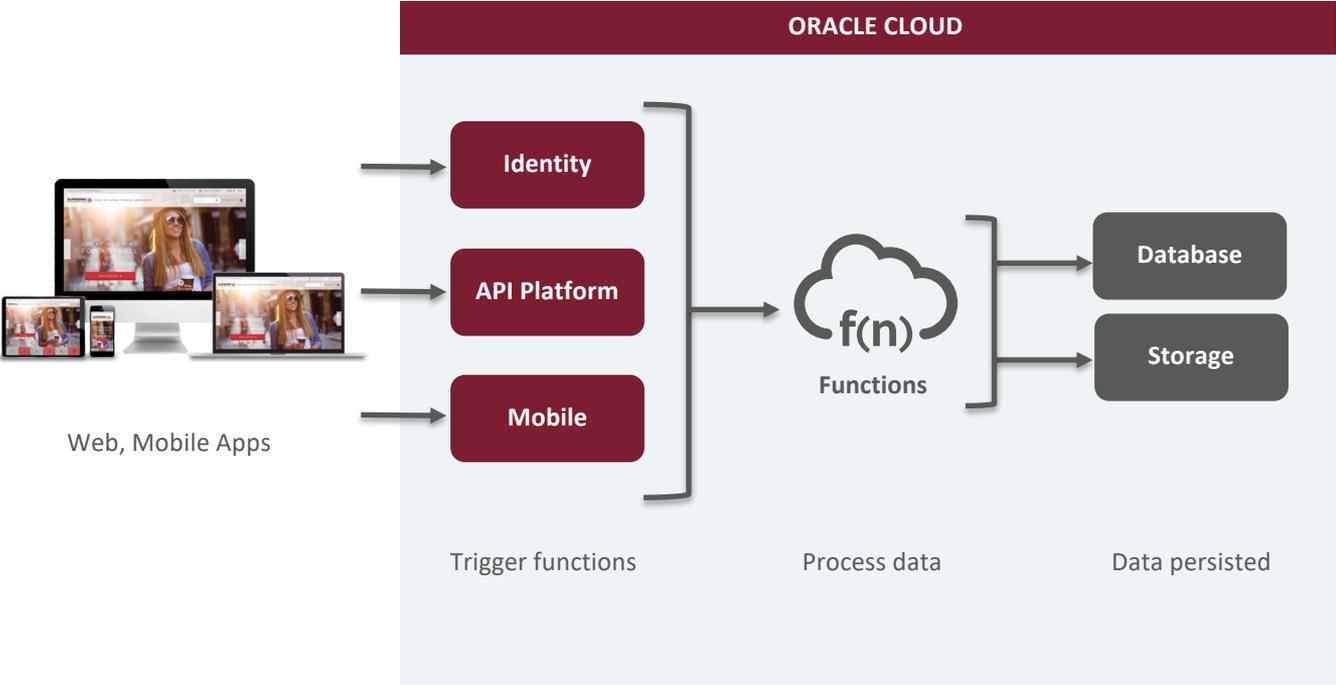
Using Events

- Events or triggers are configured differently
- Abstractly, inform the platform to what event(s) should invoke this function
- OCI Functions use Cloud Events format for portability

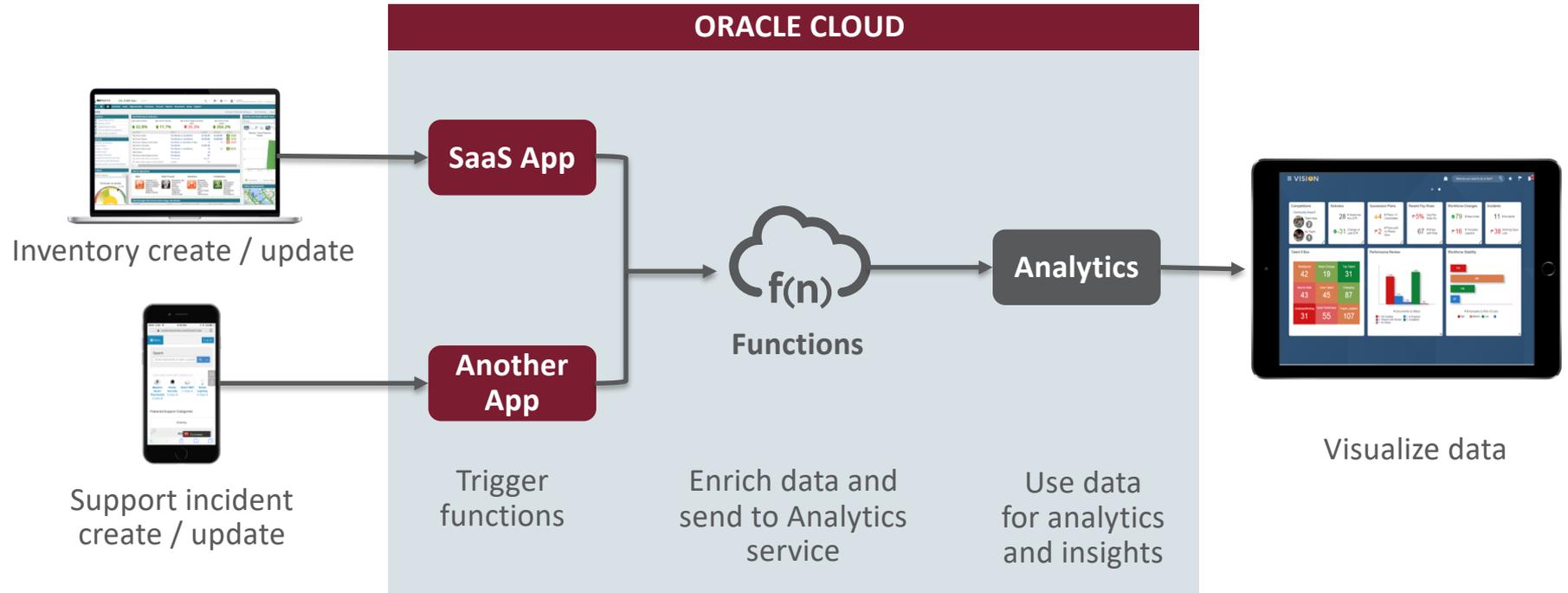


```
1. jlbutler@dulcinea: ~/ws/demo/functions (zsh)
jlbutler@dulcinea ~/ws/demo/functions cat fn-text2pdf-events/actions.json
{
  "actions": [
    {
      "actionType": "FAAS",
      "description": "Invoke PDF conversion when .txt file is uploaded to storage bucket",
      "isEnabled": true,
      "functionId": "ocid1.fnfunc.oc1.phx.aaaaaaaaacyno22s7xvnpgtl0l45hzj6tiqvd6pcfm4cpknj5kcrcsyd7hta"
    }
  ]
}
```

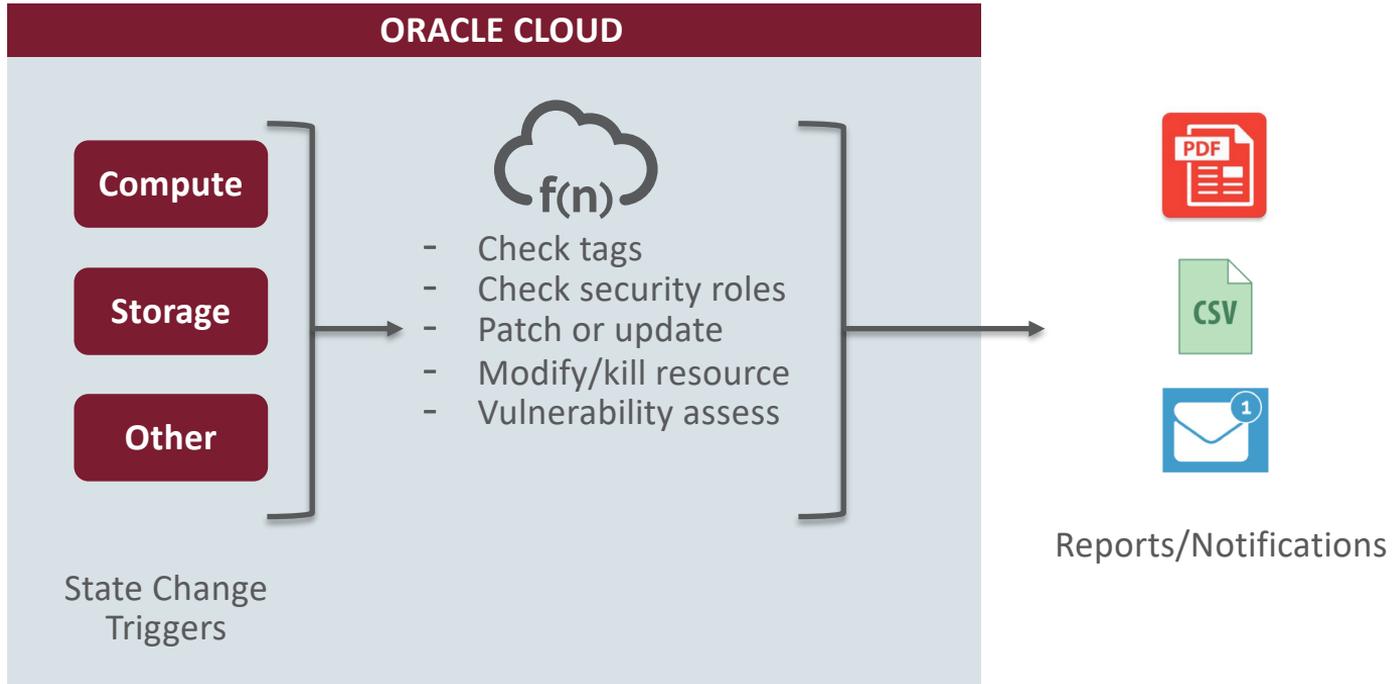
Use Case: Web and Mobile Backends



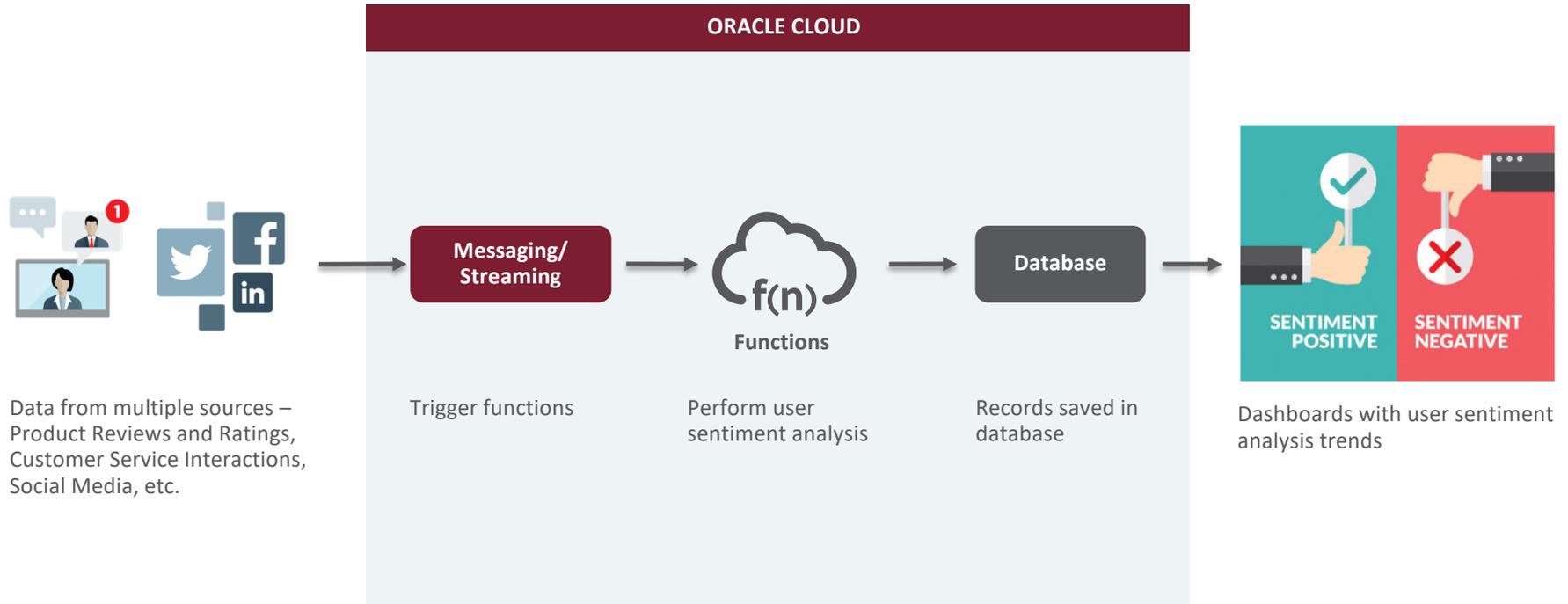
Extend and Enhance Existing Applications



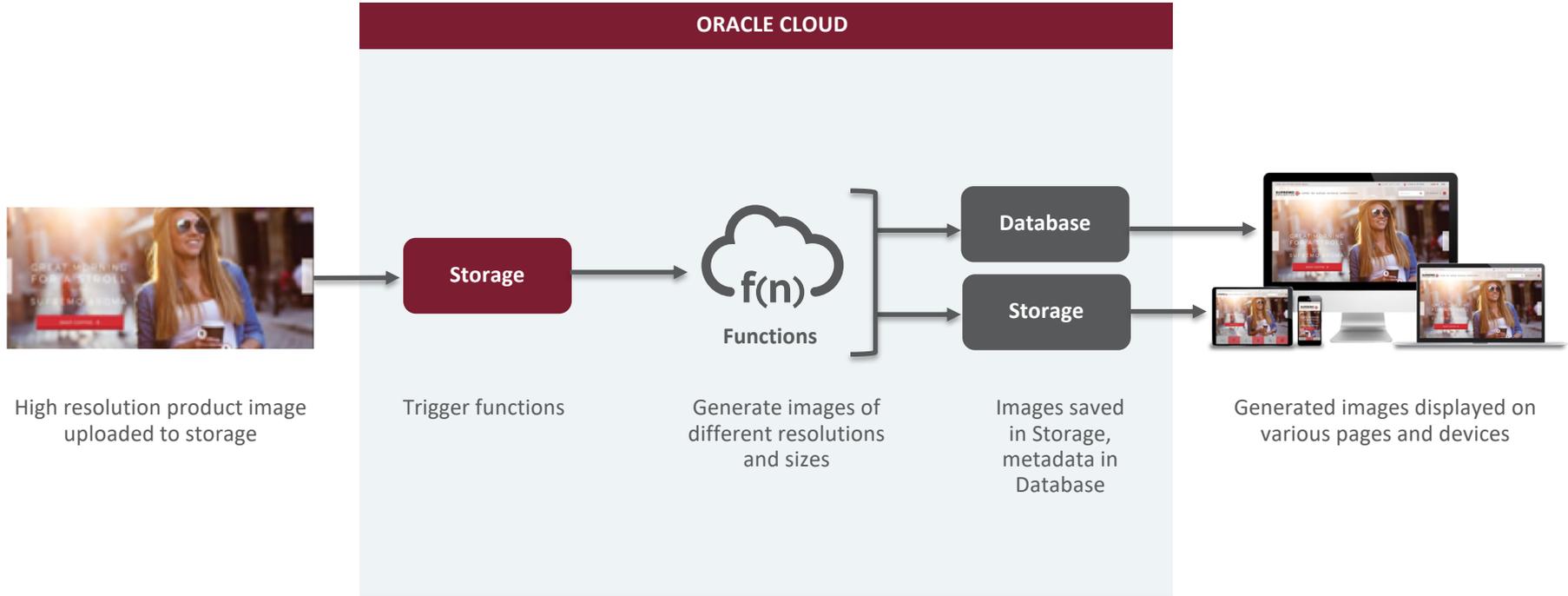
Automation and DevOps



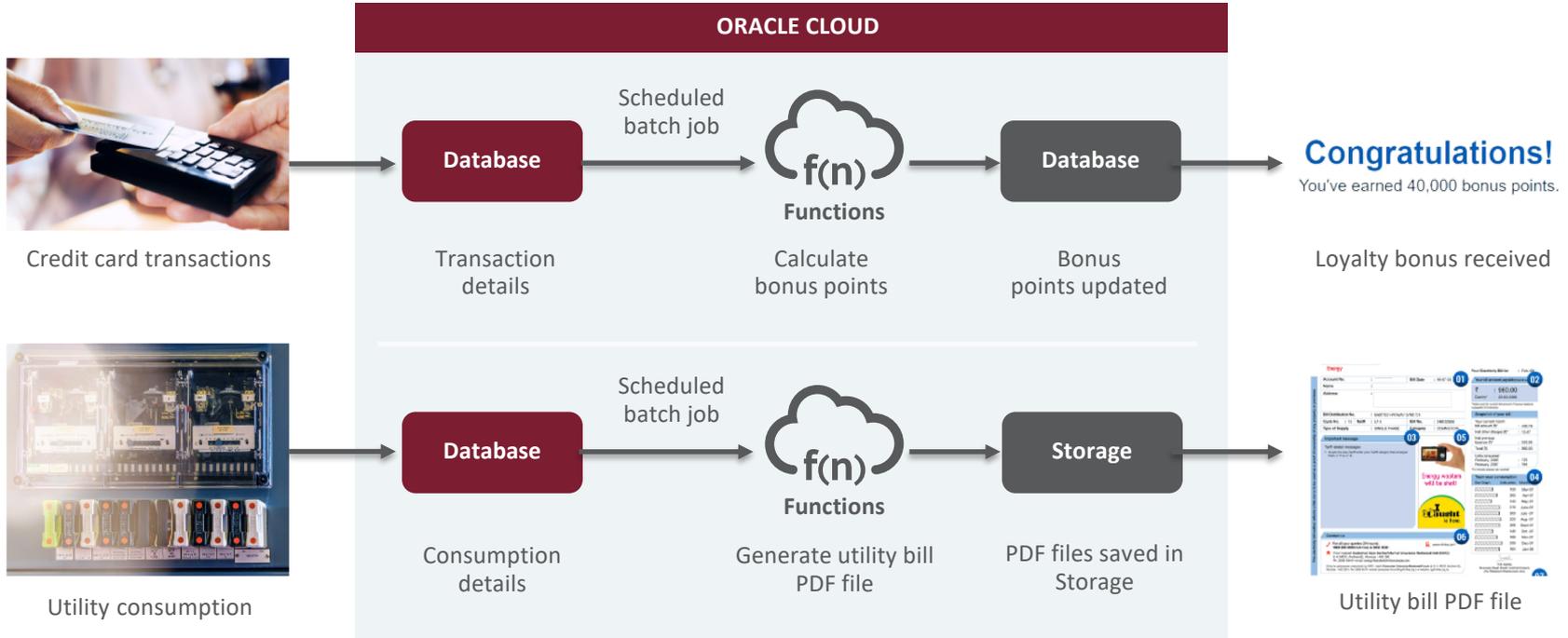
Use Case: Real-Time Stream Processing



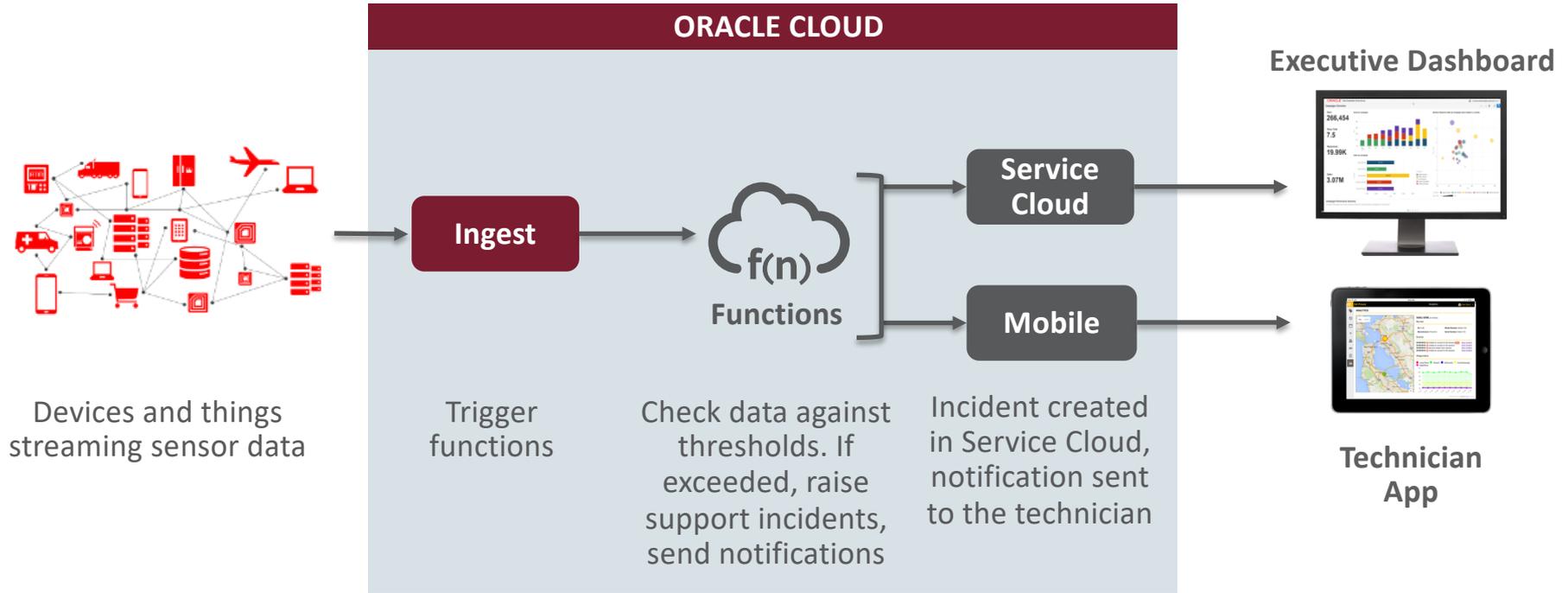
Use Case: Real-Time File Processing



Use Case: Batch Processing



Internet of Things



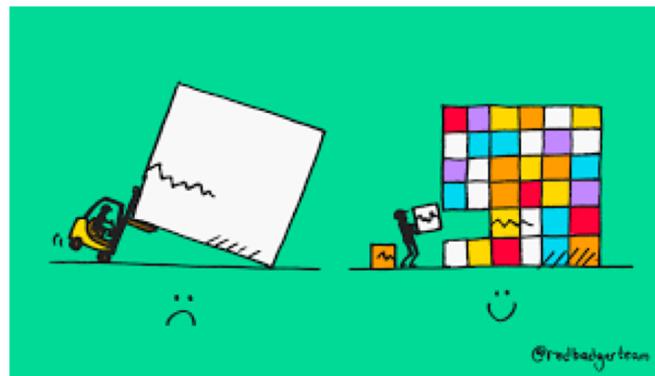
Mapping Execution, Events and Architecture

- Eventing model is driven by the requirement and context
- Choose the right execution model for your application



Choose a Pattern that Helps you Minimize

- Less is more, good rule of thumb is a single handler per module
- Better to proliferate than to decompensate
- Observability and triage become infinitely easier at the boundaries



Separate and Simplify

- Typically consumption of events define application boundaries
- Share libraries between functions and applications, not execution context



Separate and Simplify

- Don't worry about cold starts
- Do worry about lock-in and data egress





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Thanks!

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cloudnative.oracle.com