

Building the Ocado Smart Platform

Paul Sweetman - Head of Software Architecture

Alex Harvey - Head of robotics and autonomous systems



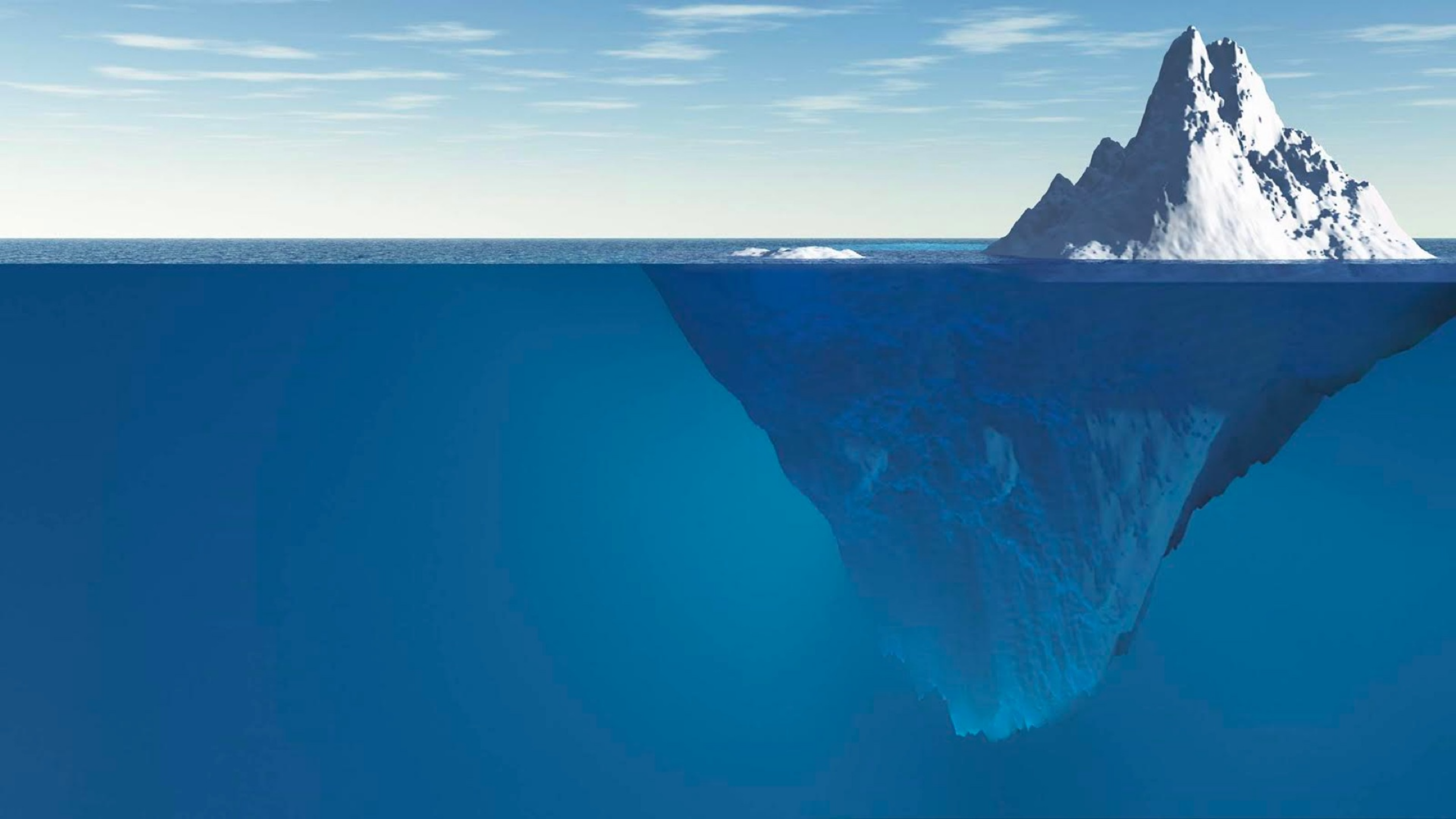


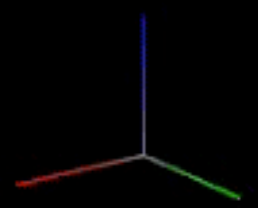
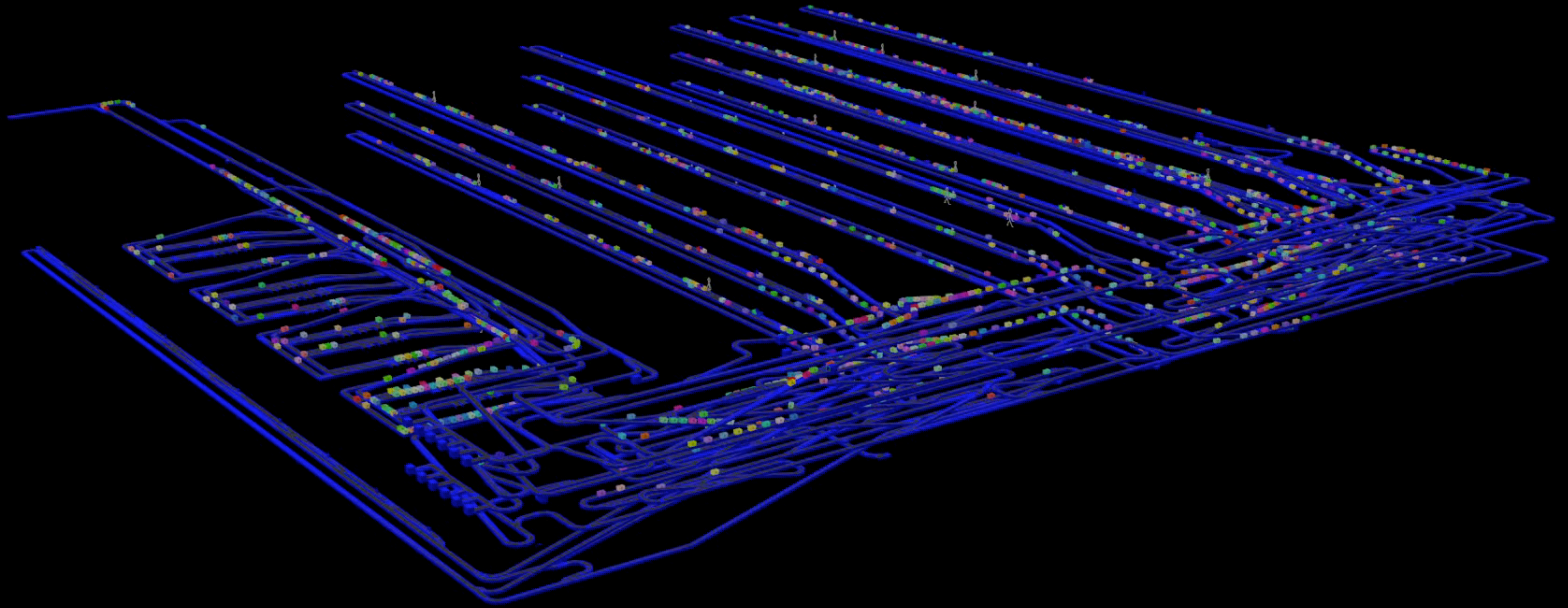
ocado[®]
SMART PLATFORM





do.com
online supermarket





What Ocado Technology does



**Automation
and robotics**



**Data science
and AI**



**Big data
and the cloud**



**Web and app
development**



**Algorithms and
smart optimization**



**Discrete-event
simulation**



* Transform to platform provider

Reduce developer
friction

~

Homogenous
platform

OPERATIONAL

REAL-TIME CONTROL

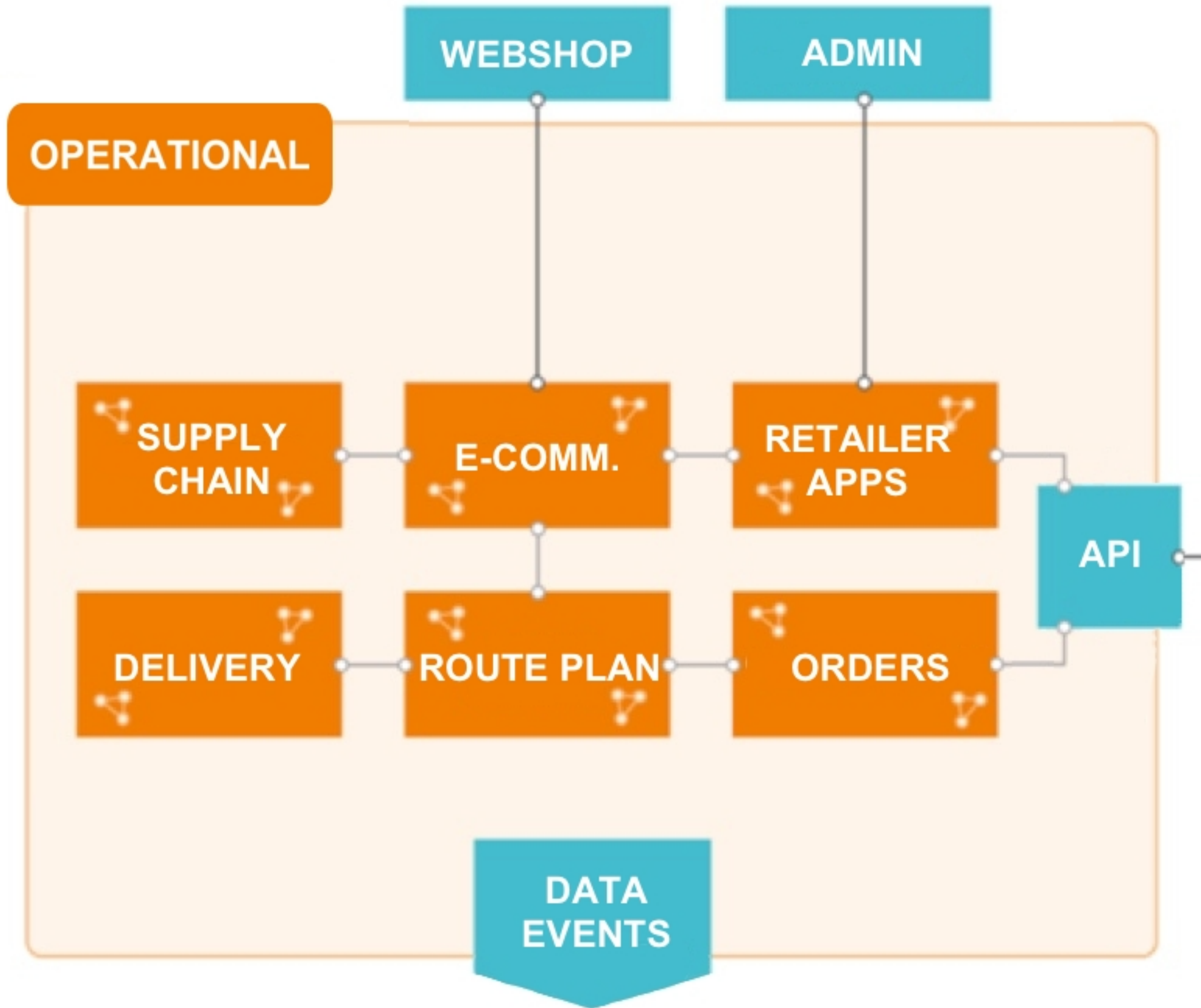
API

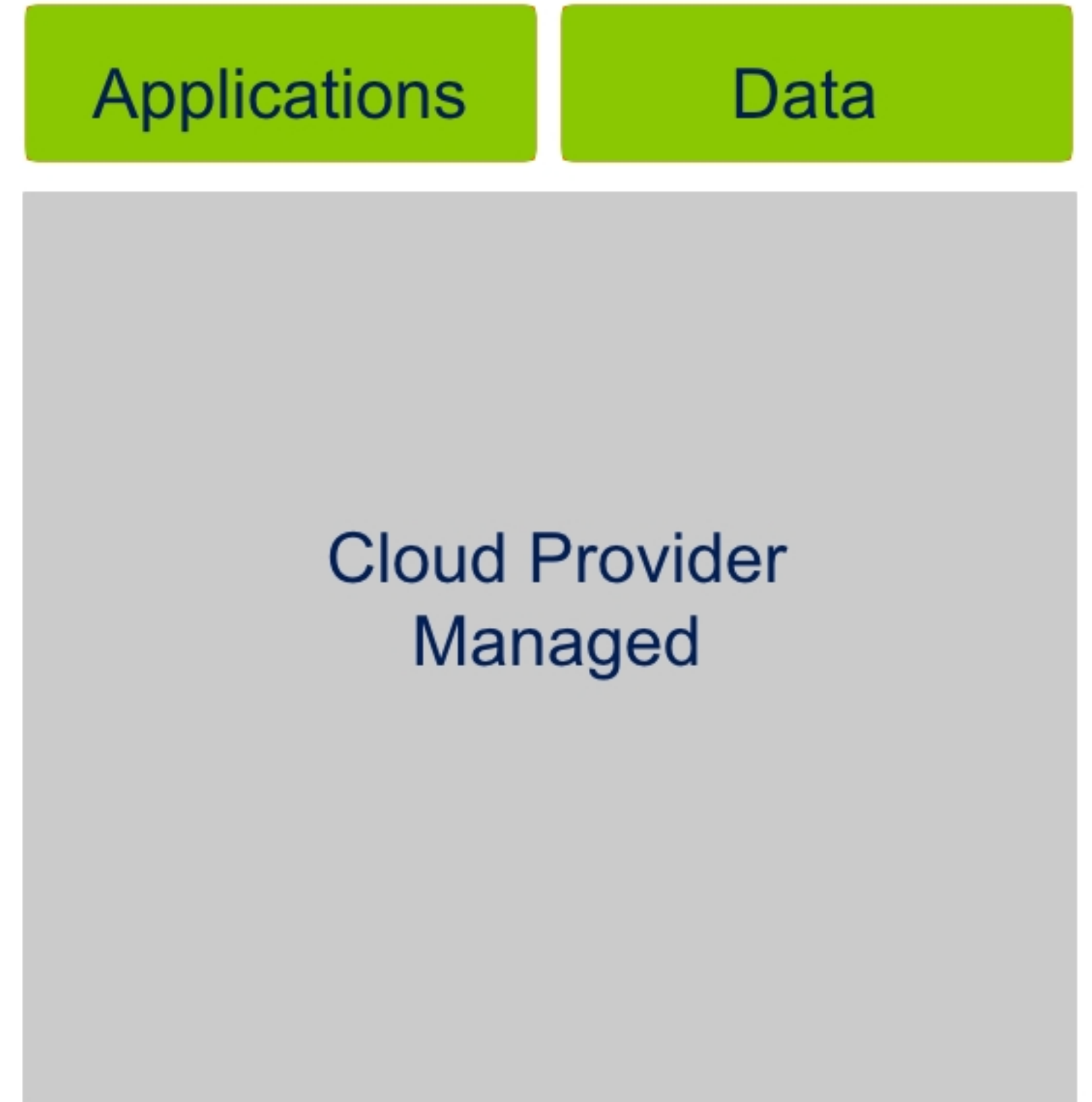
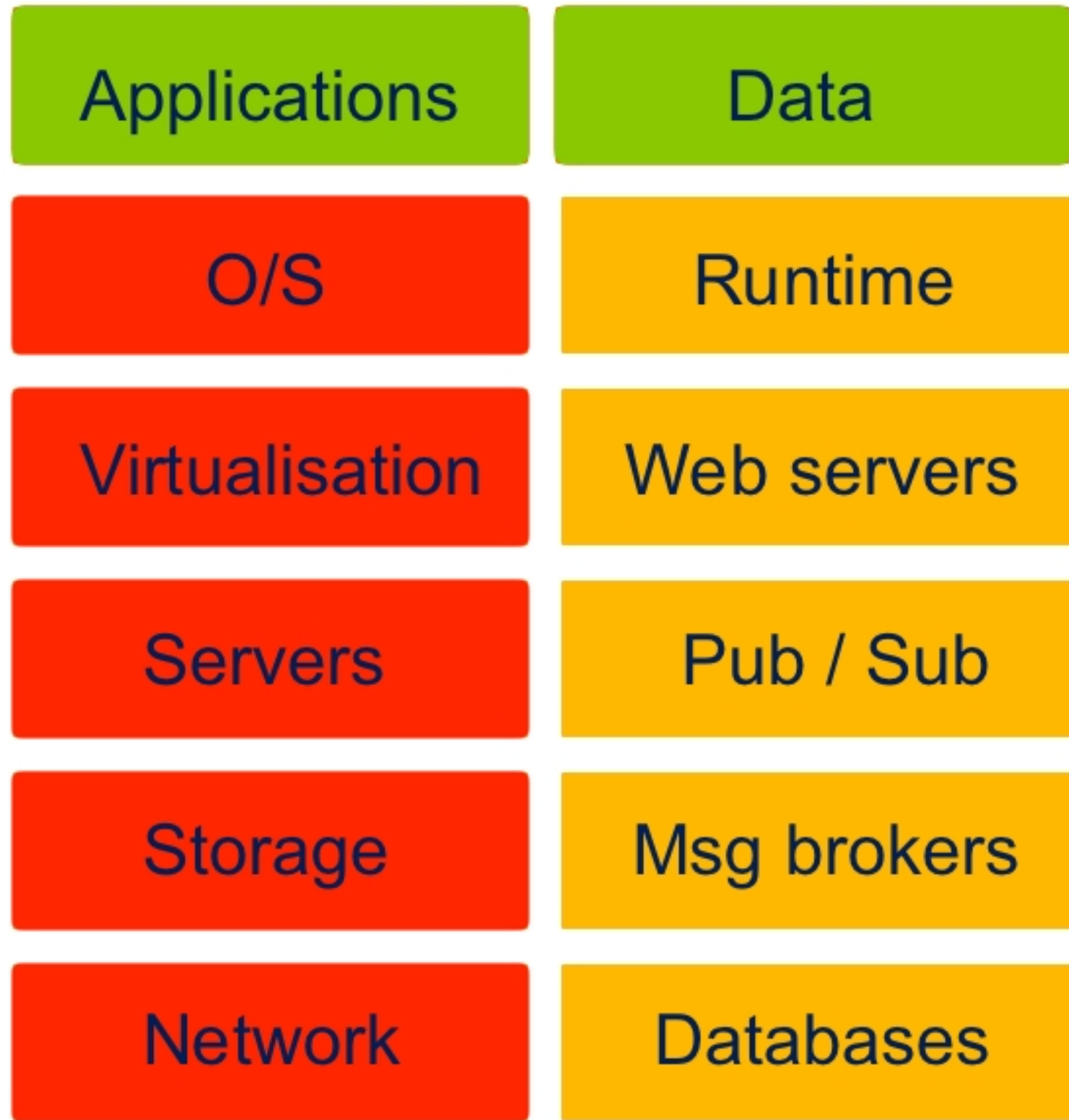
API

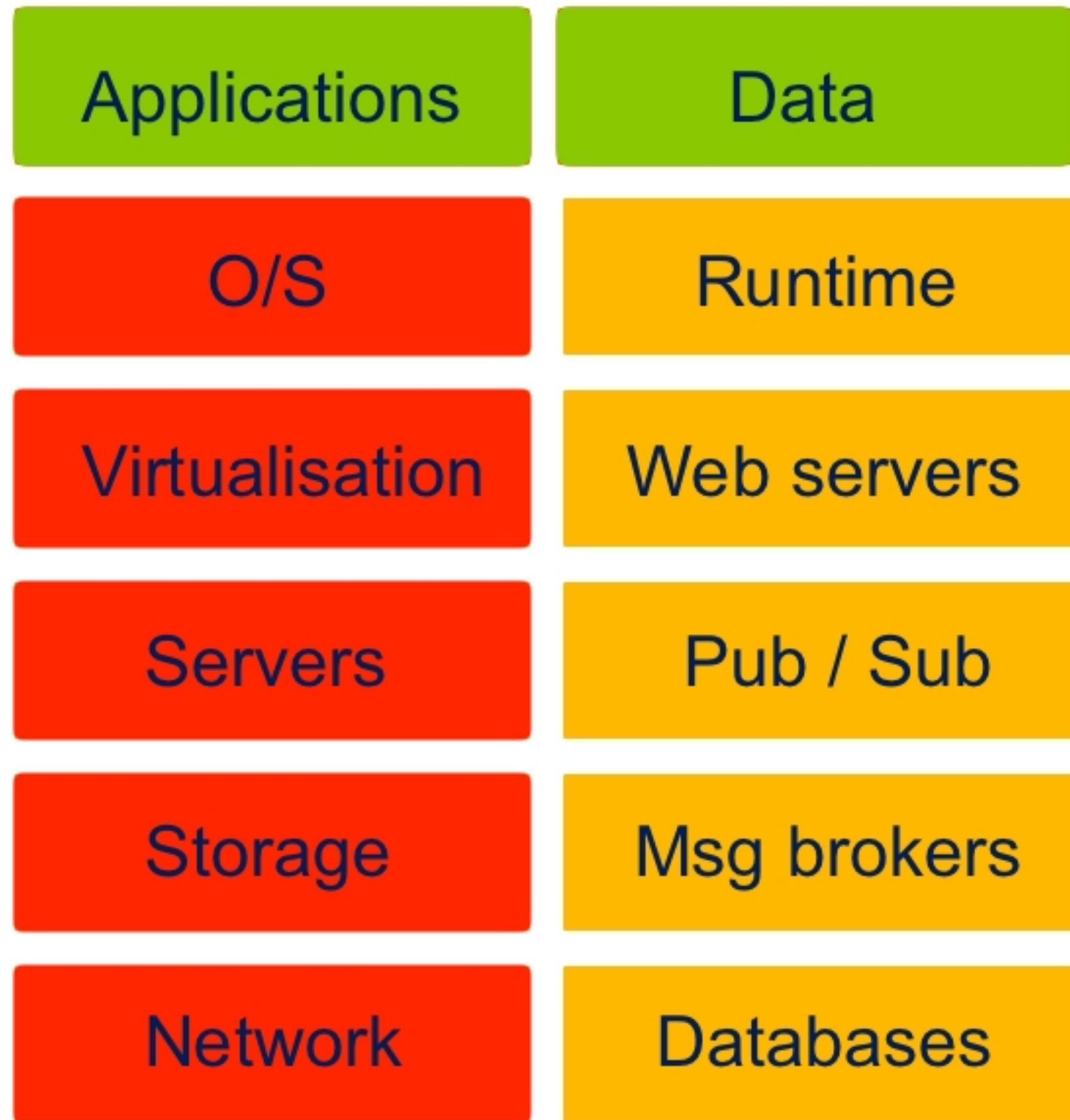
DATA
EVENTS

DATA
EVENTS

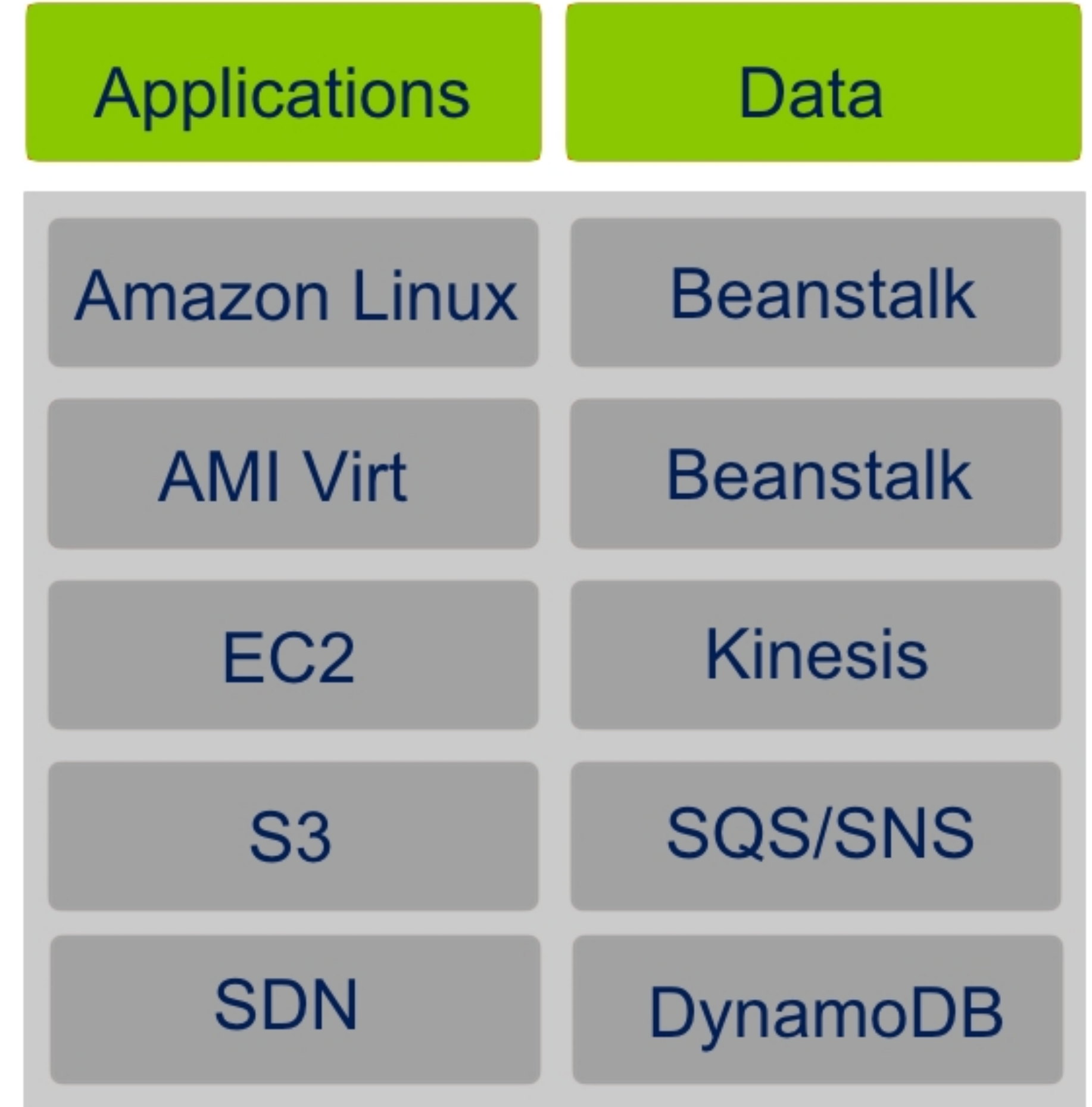
DATA SCIENCE & ML



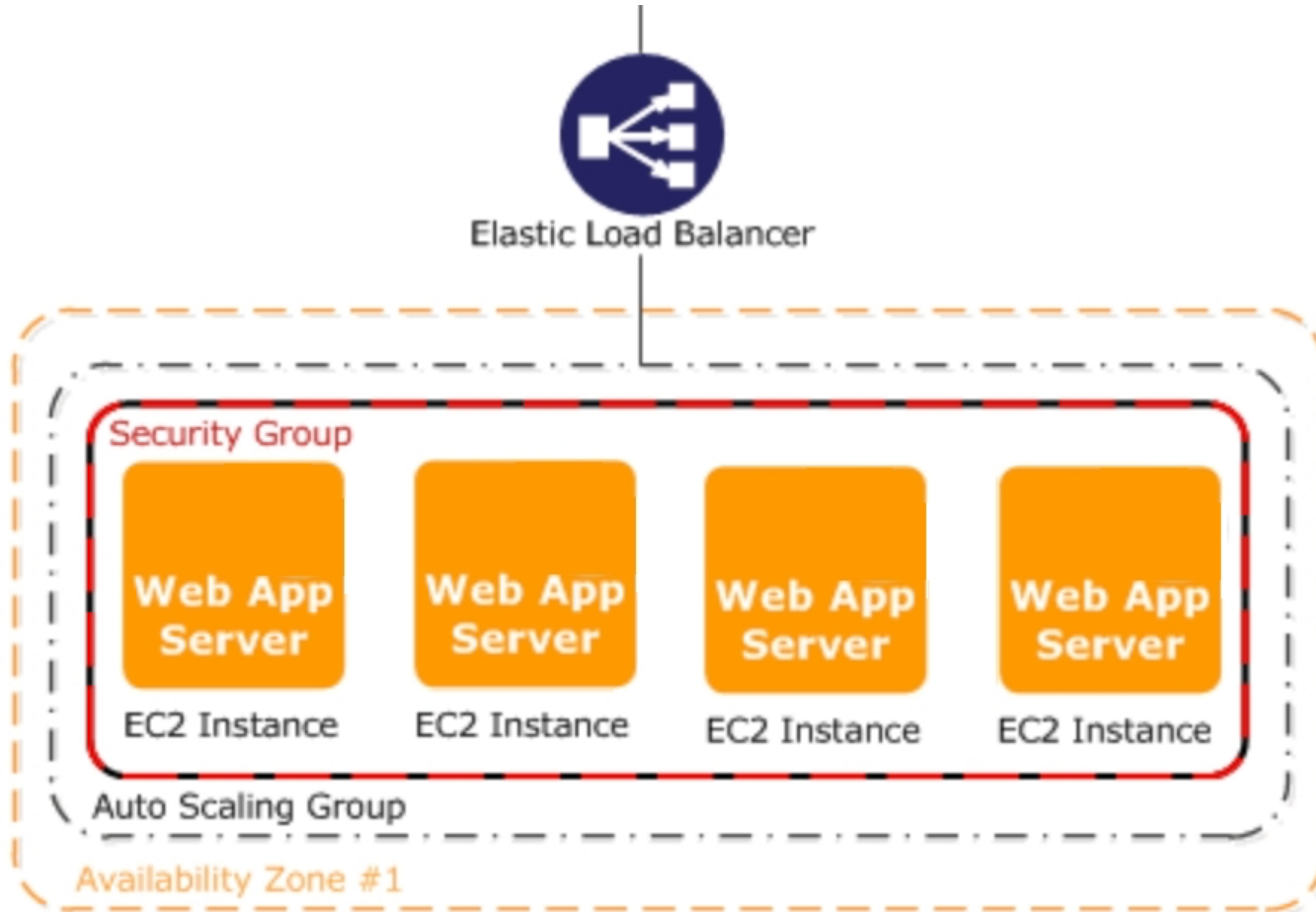




Cloud Provider
Managed



AWS Elastic Beanstalk

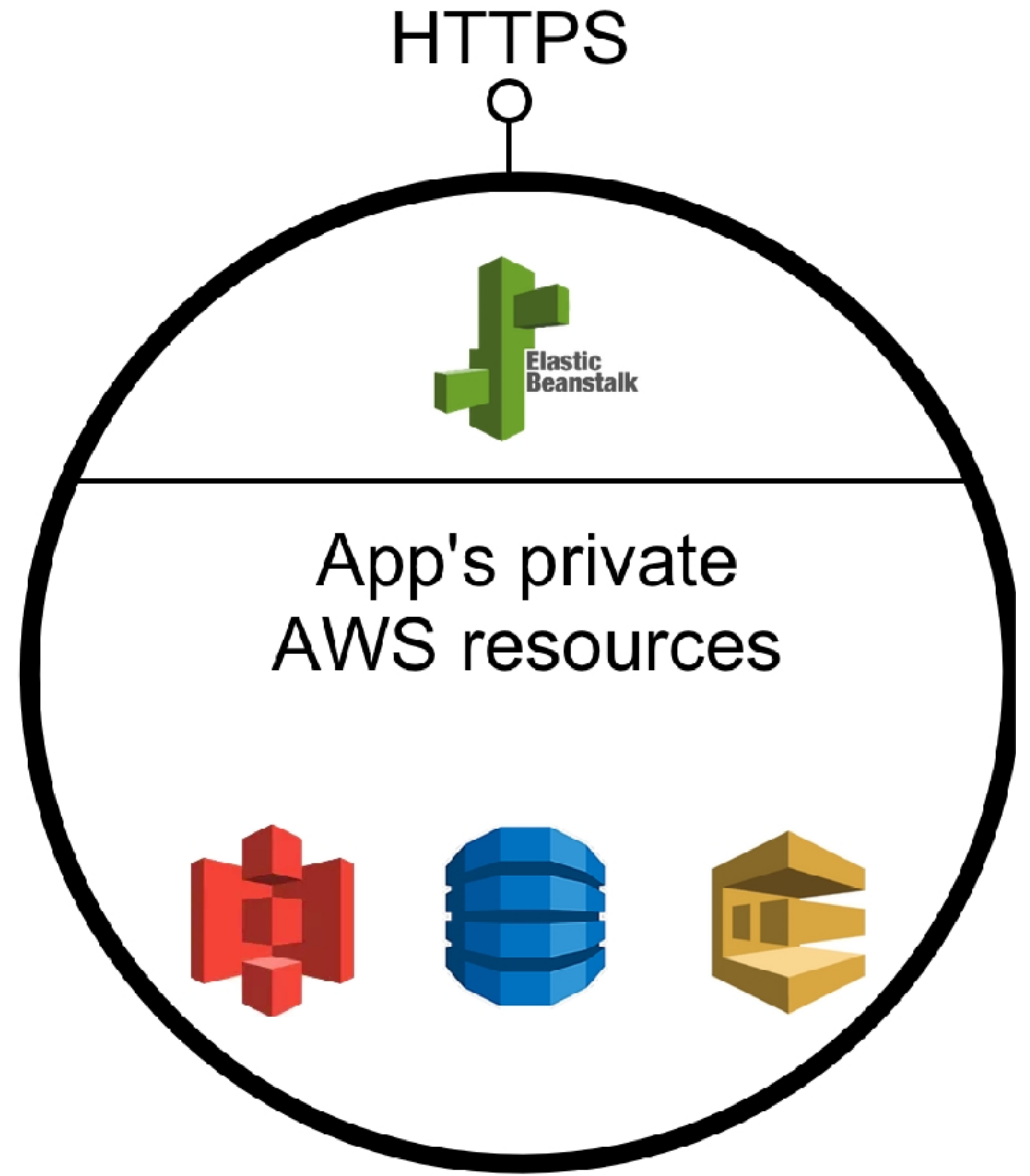


Golden rule for developers

Don't deploy infrastructure into the cloud if the cloud provider offers a similar managed service



Cloud Provisioning



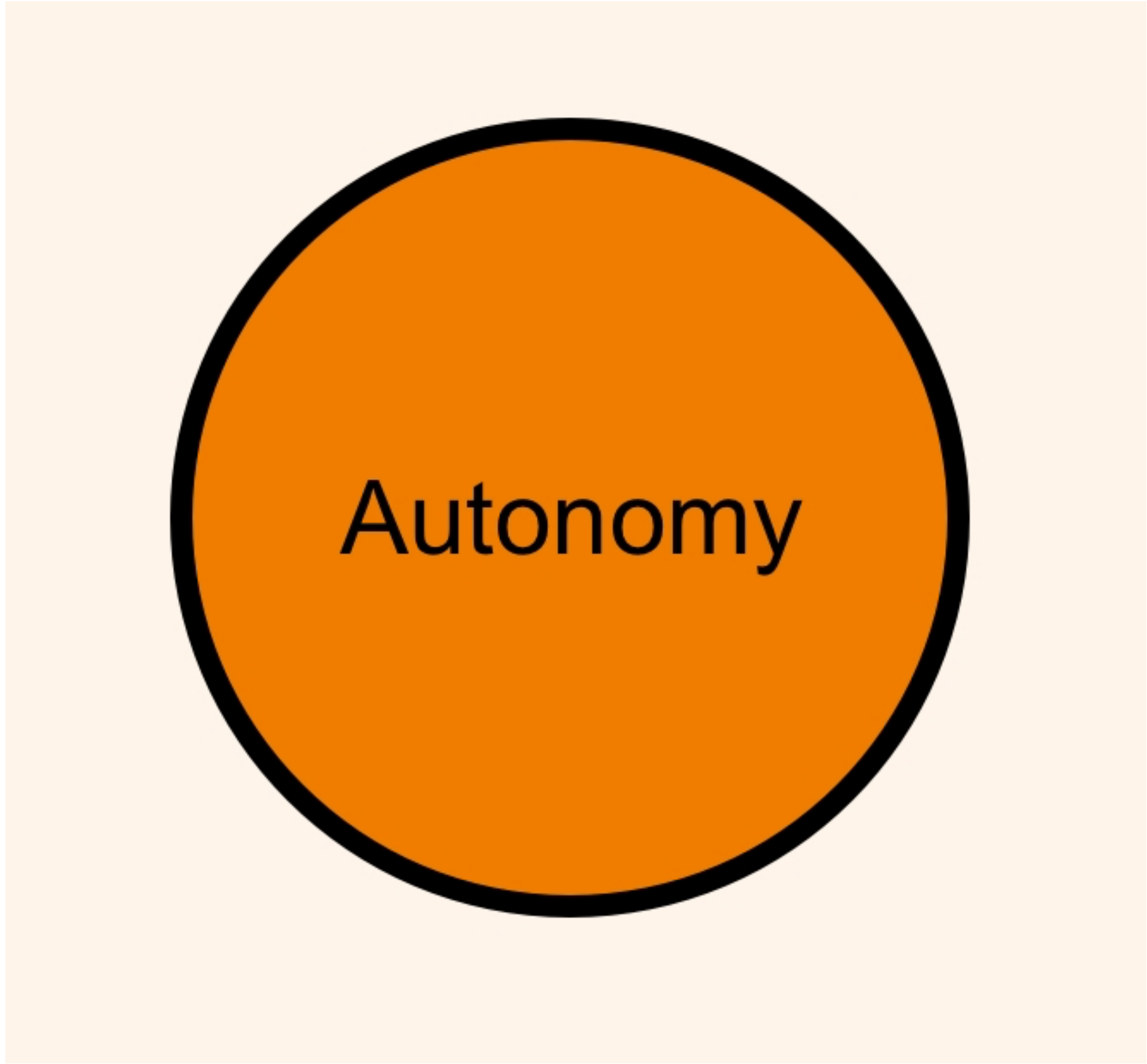
'kitemarks'

Best practises:

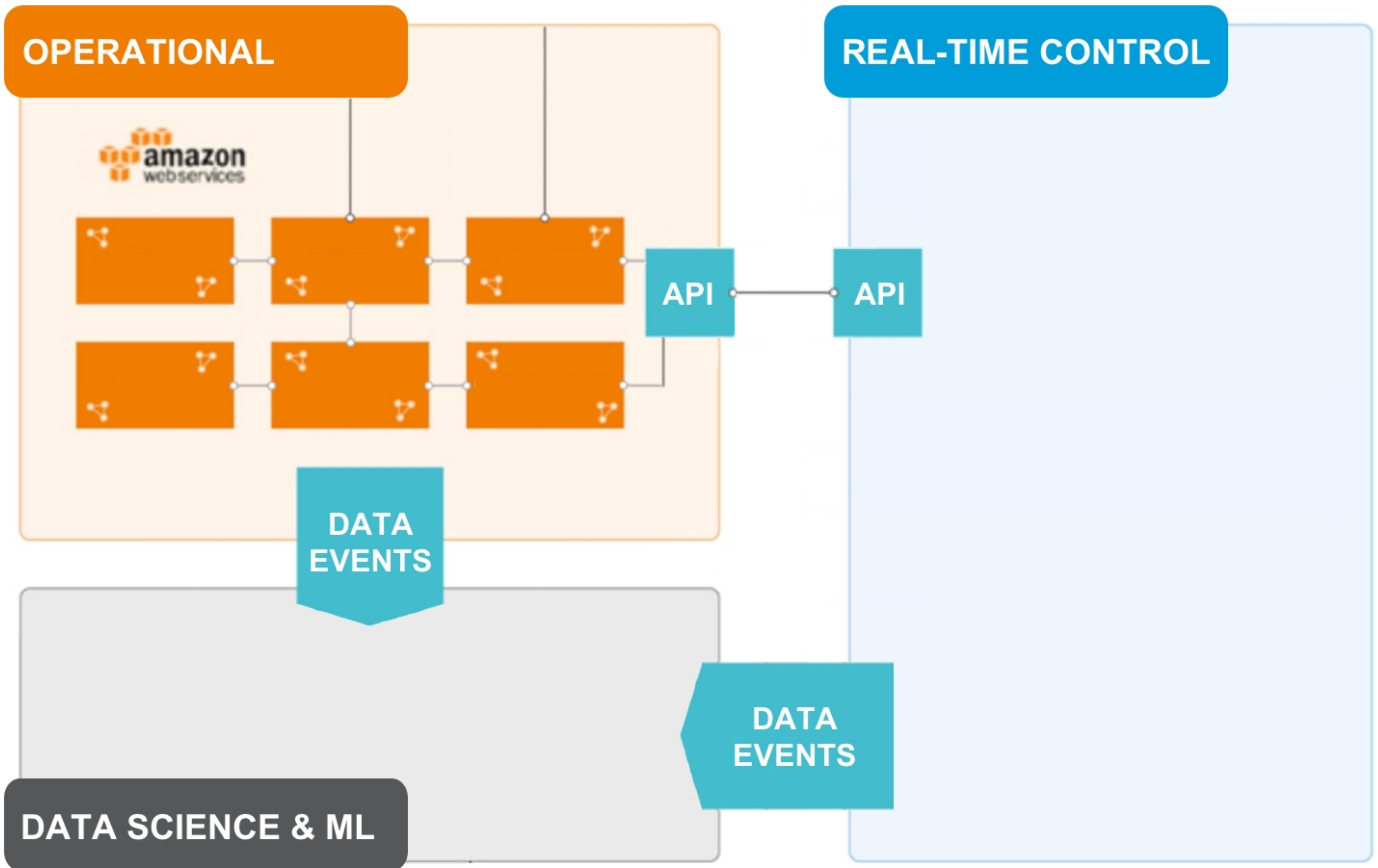
- * plan for each server to fail daily
- * run in multiple available zones
- * no config of boxes via ssh

Platform standardisation:

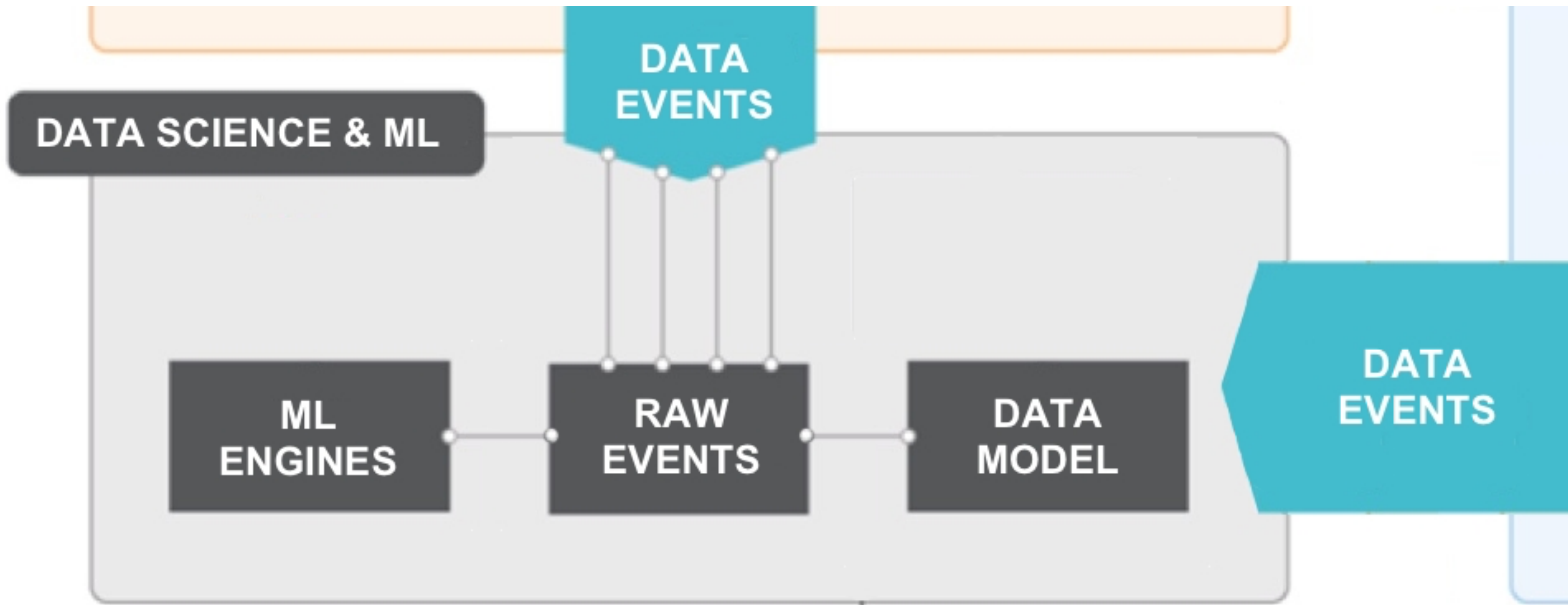
- * exchange all data in JSON
- * always send and store datetimes in UTC
- * adhere to API and UX guidelines



What not how.



Data Platform



Data platform objectives

- * homogenous centralised lake
- * 1 loc to land data
- * dev teams own data end-to-end



AWS Kinesis

GCP BigQuery



AWS Kinesis



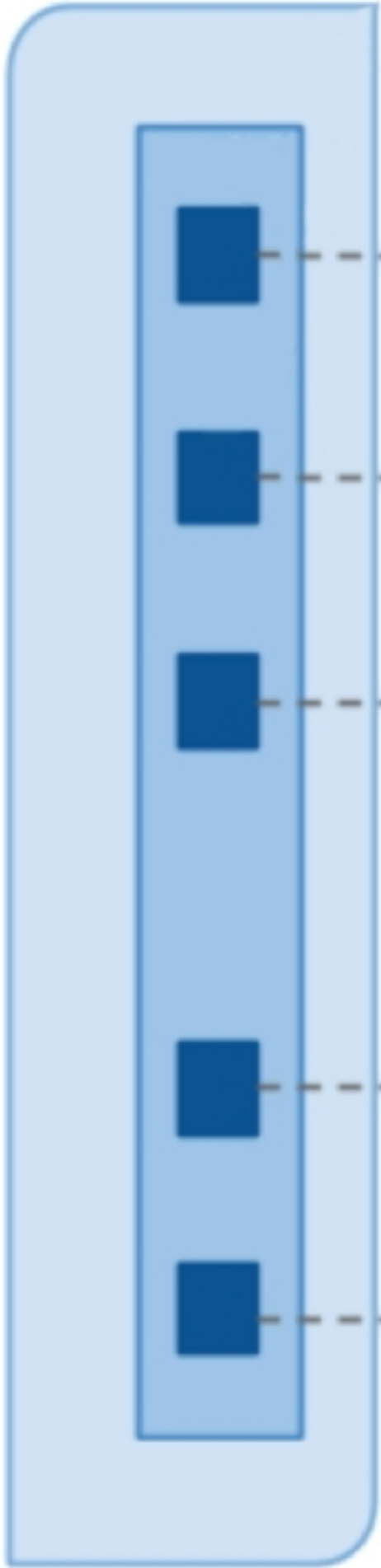
GCP BigQuery

App

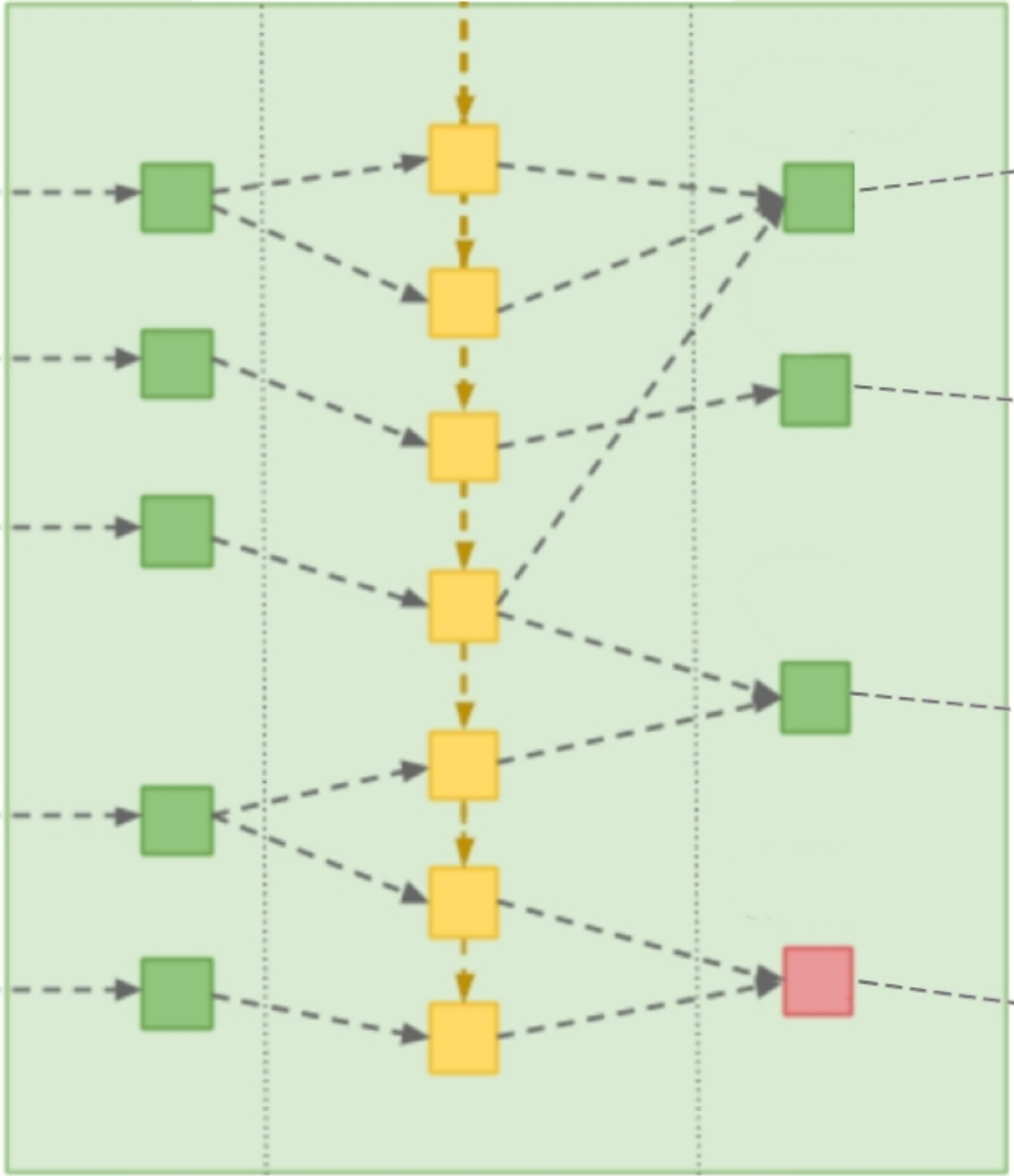
```
ListenableFuture<Result> result =  
    epl.asyncSendEvent(object, stream);
```



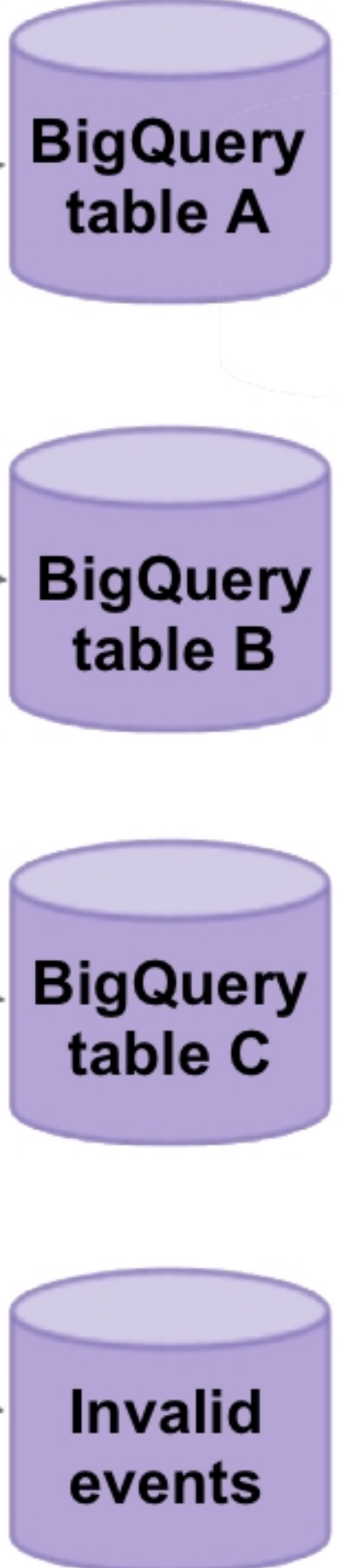
Kinesis



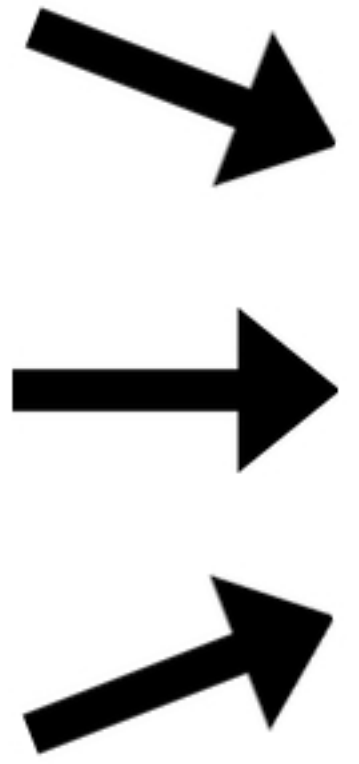
Event Processor



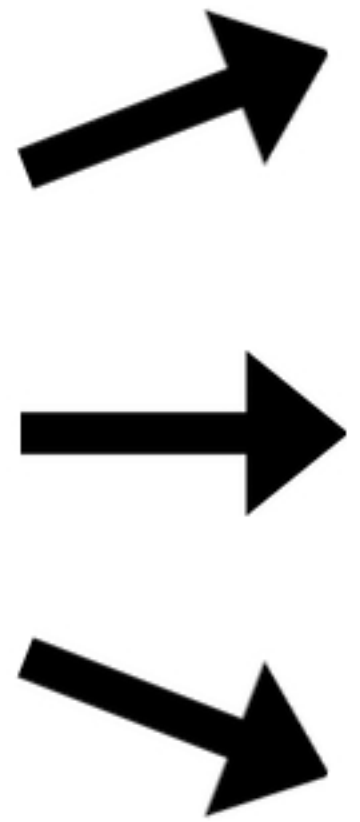
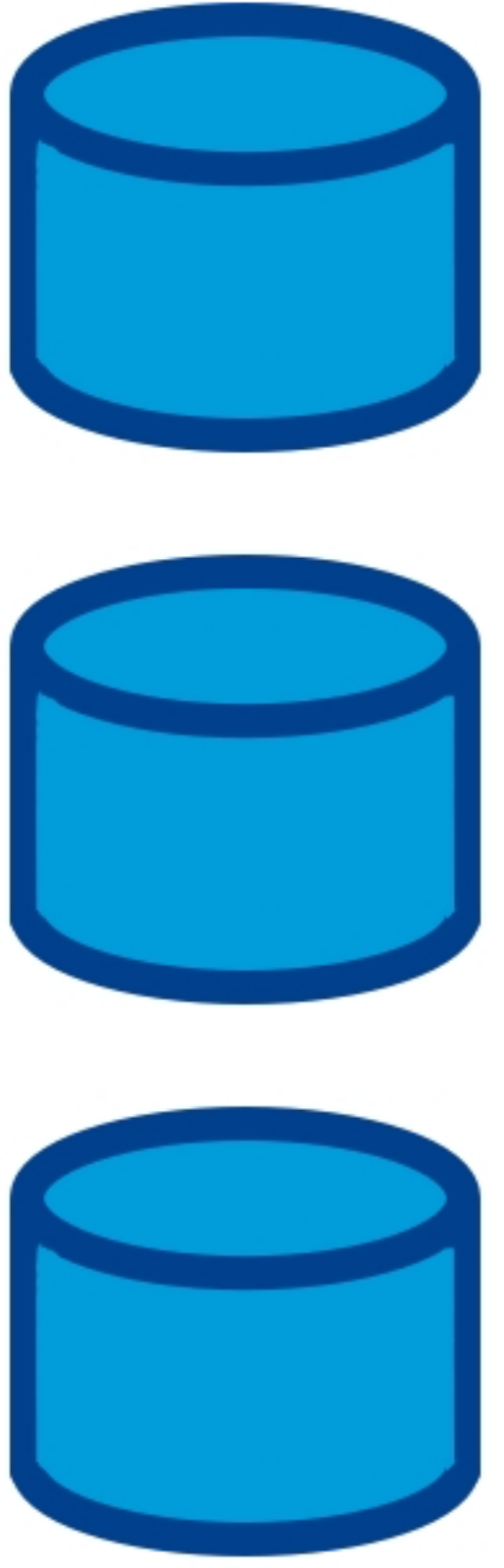
BigQuery



Raw Events



Data Objects



Cloud ML



OPERATIONAL

REAL-TIME CONTROL



API

API

DATA
EVENTS



DATA
EVENTS

DATA SCIENCE & ML

REAL-TIME CONTROL

API

DATA
EVENTS



Building efficient,
scalable,
and resilient
warehouse systems

Real Time Control System



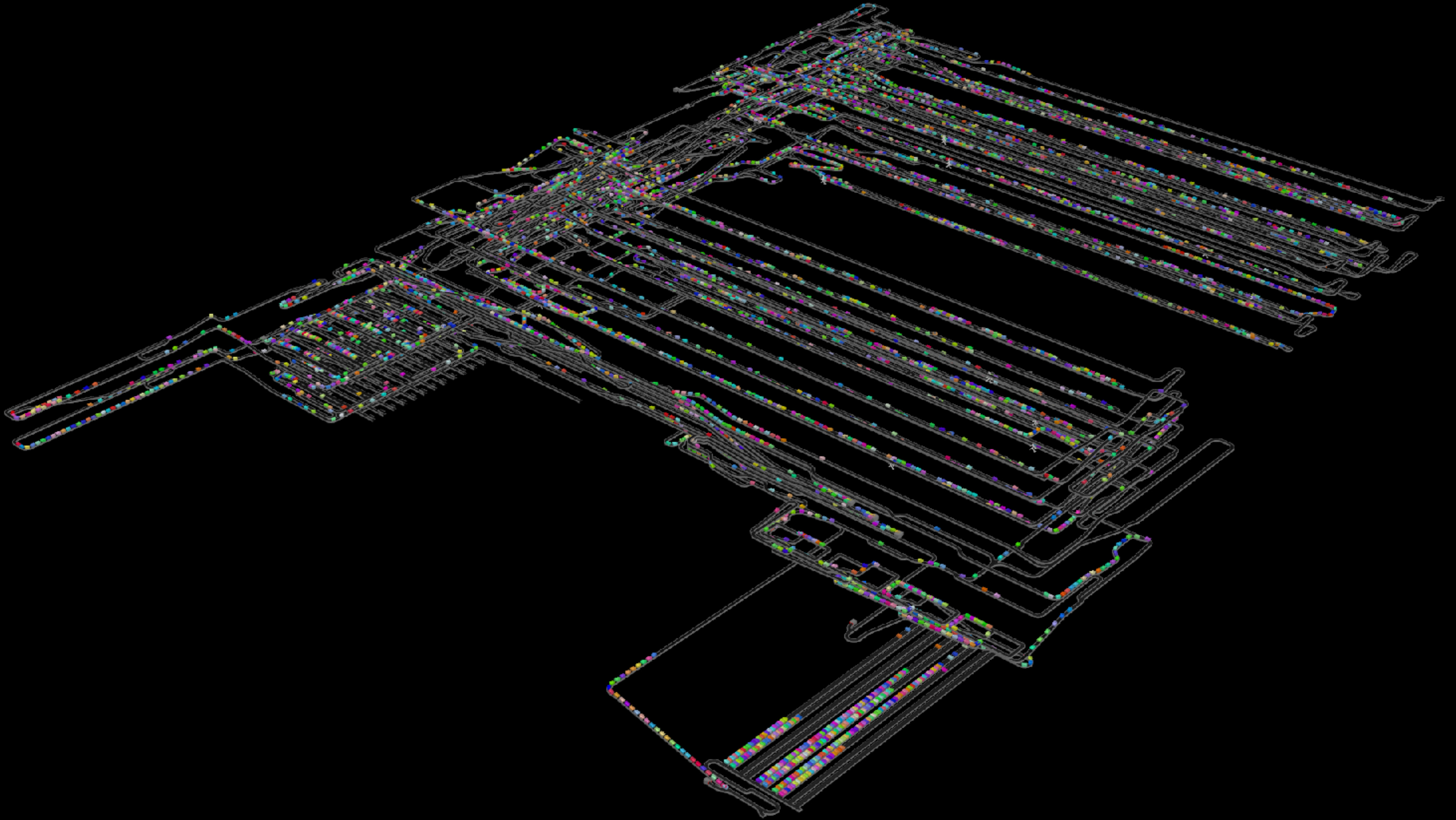
Real Time Control System



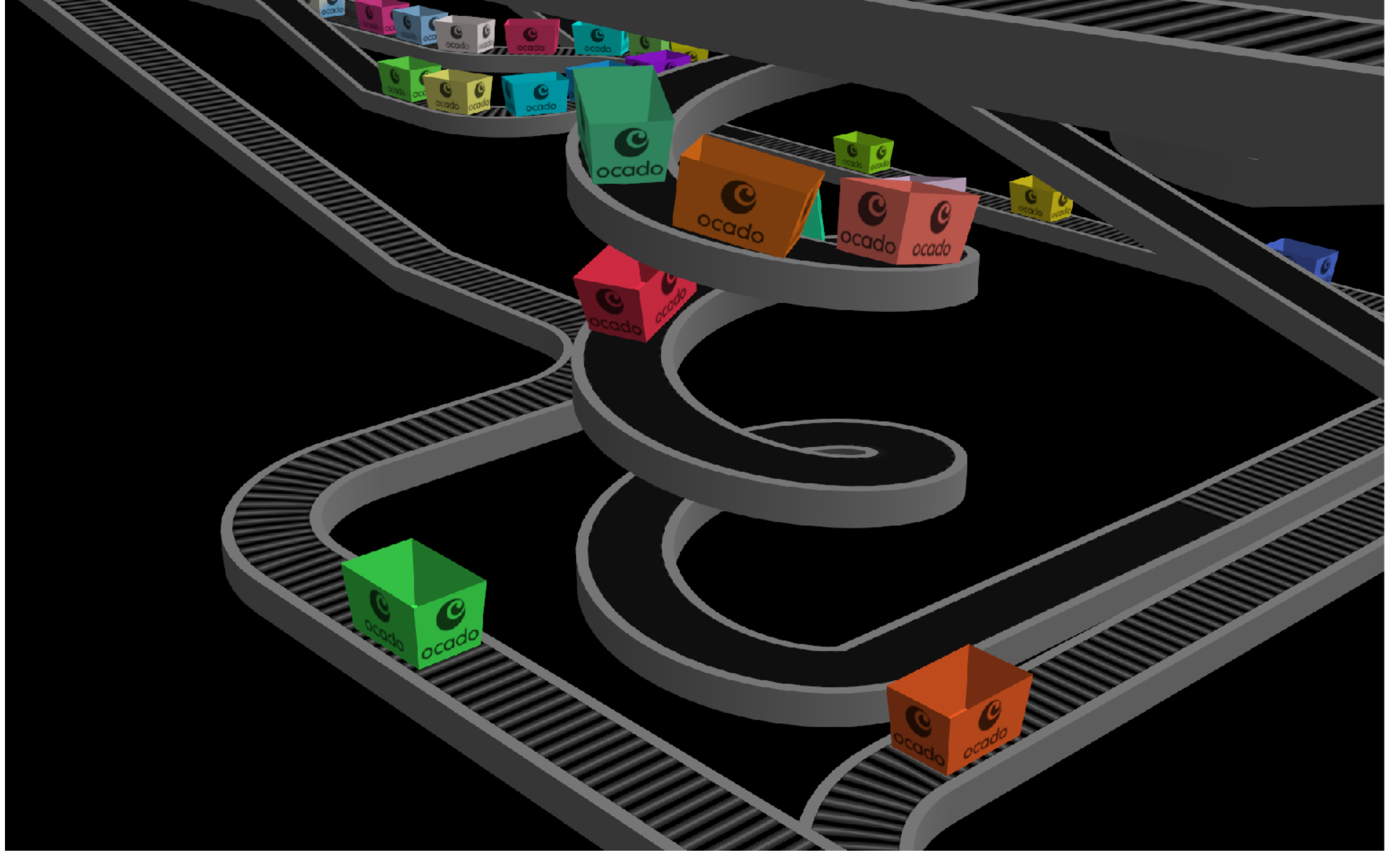
Real Time Control System



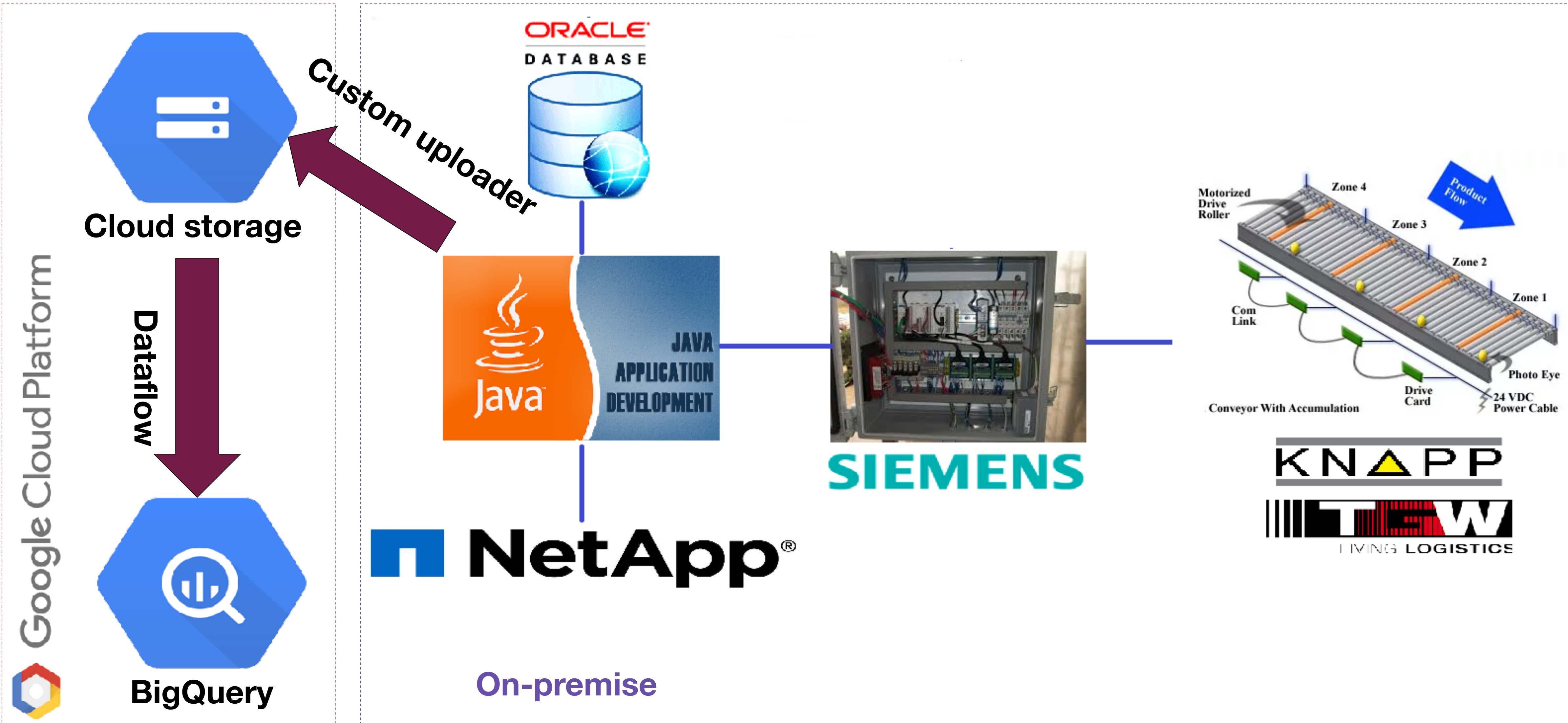
Real Time Control System



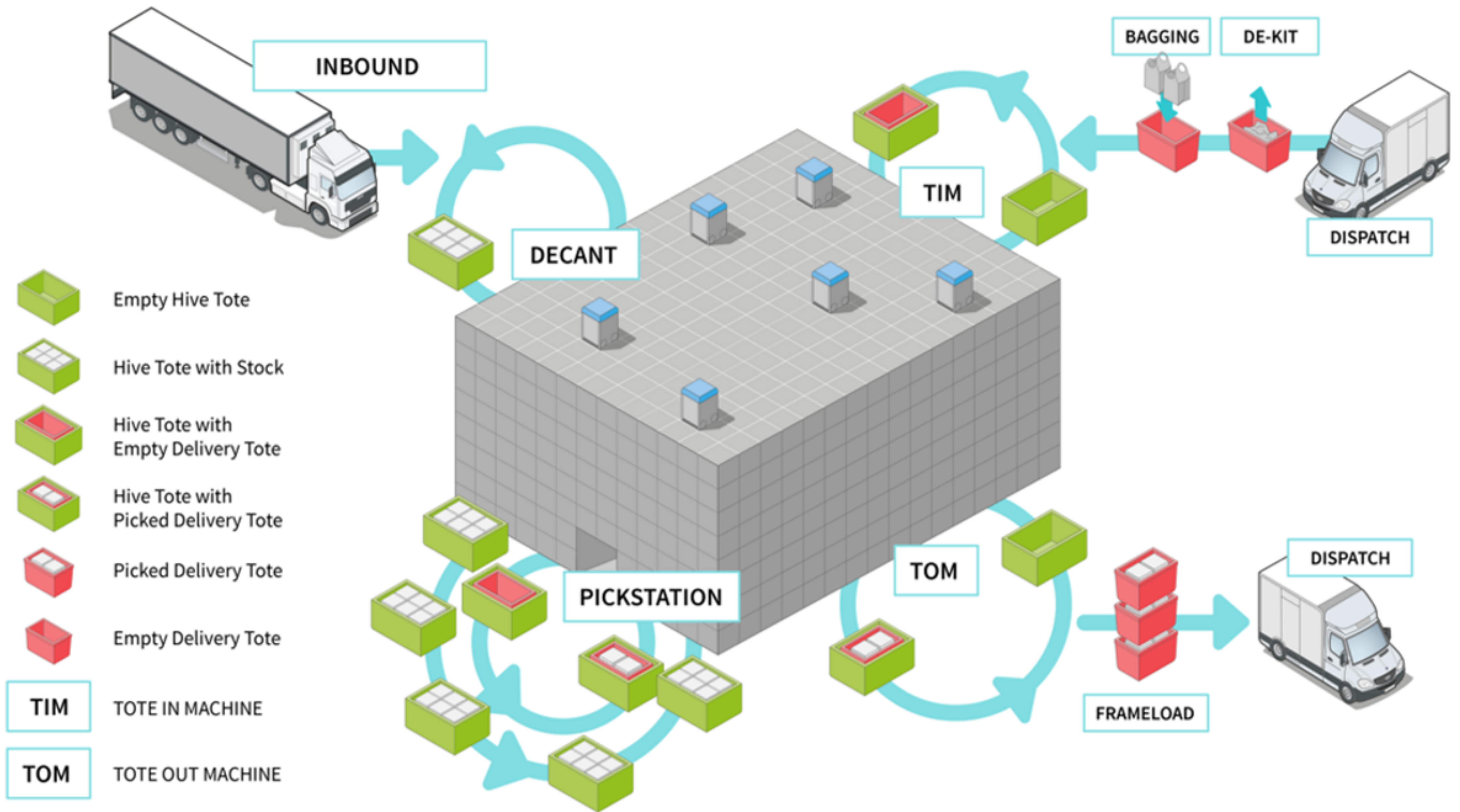
Real Time Control System



Real Time Control System



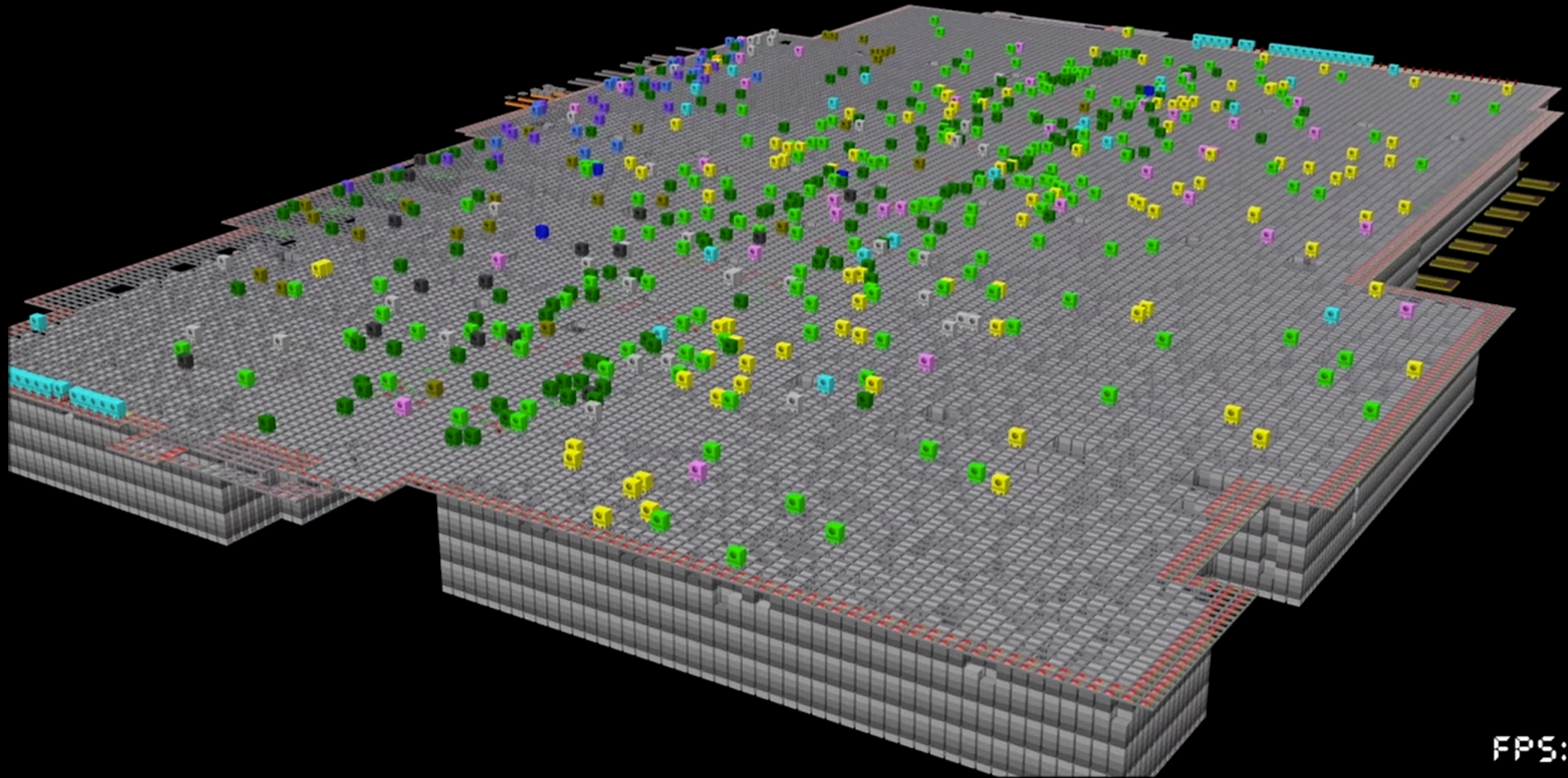
Real Time Control System





00:20:46.55

X2



FPS: 30

Real Time Control System



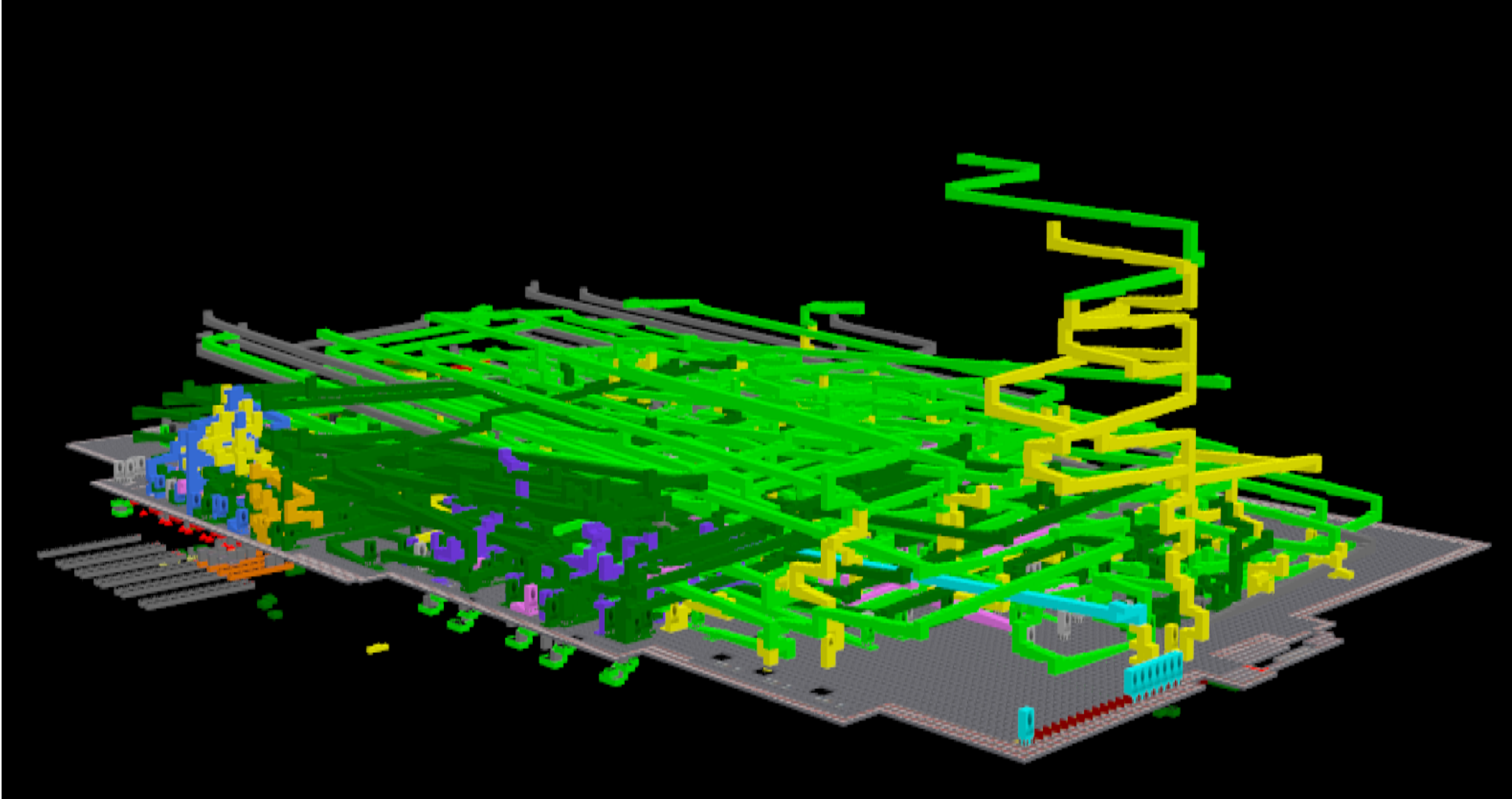
Real Time Control System

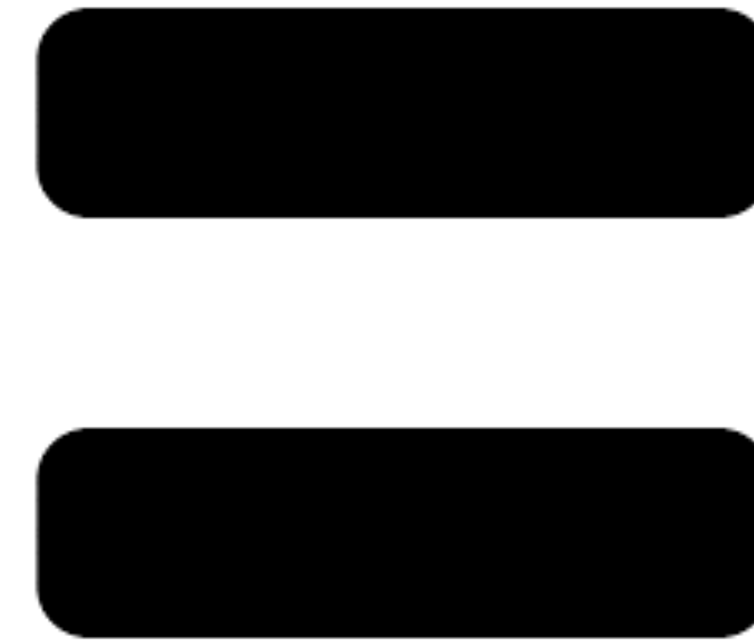


Real Time Control System



Real Time Control System



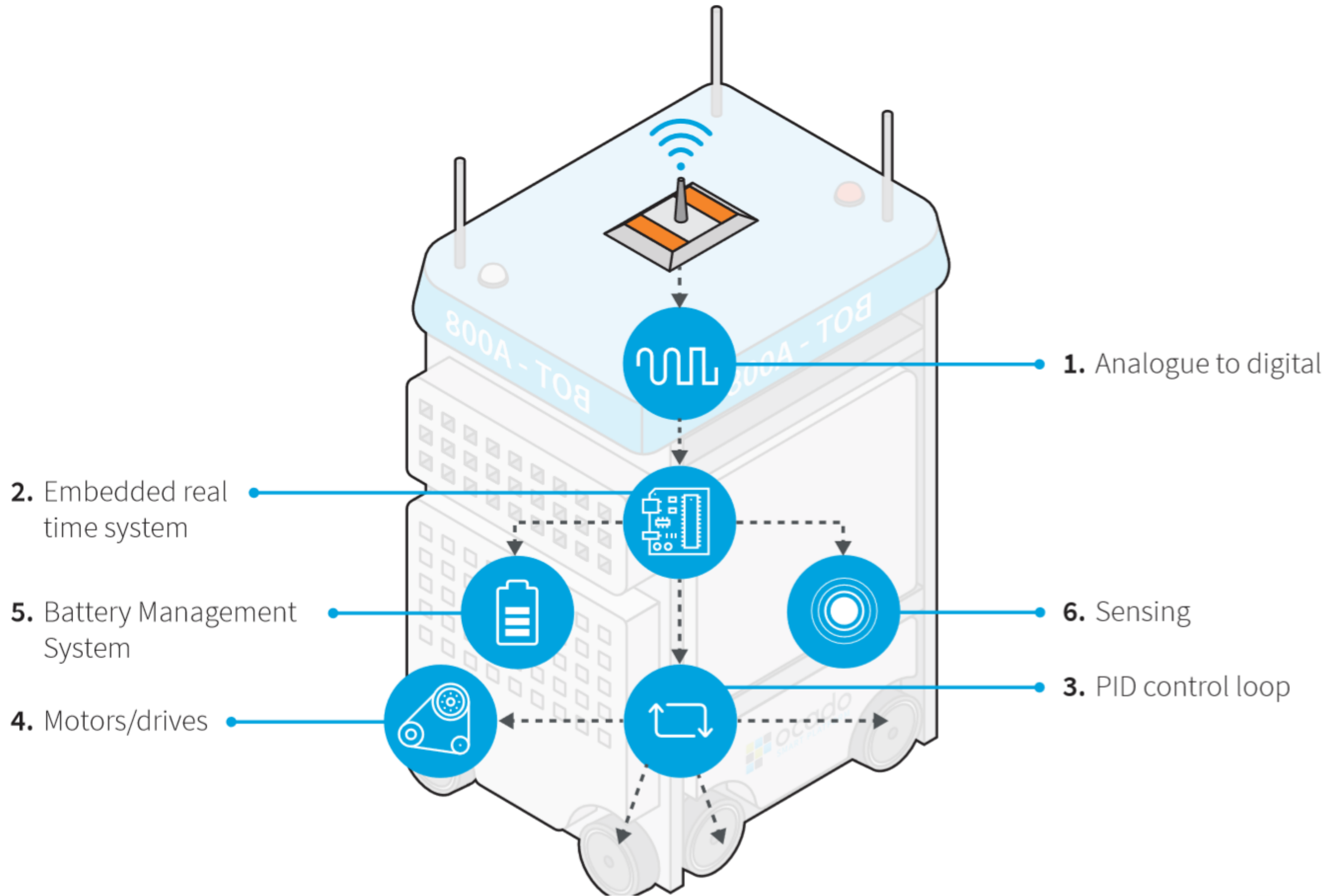


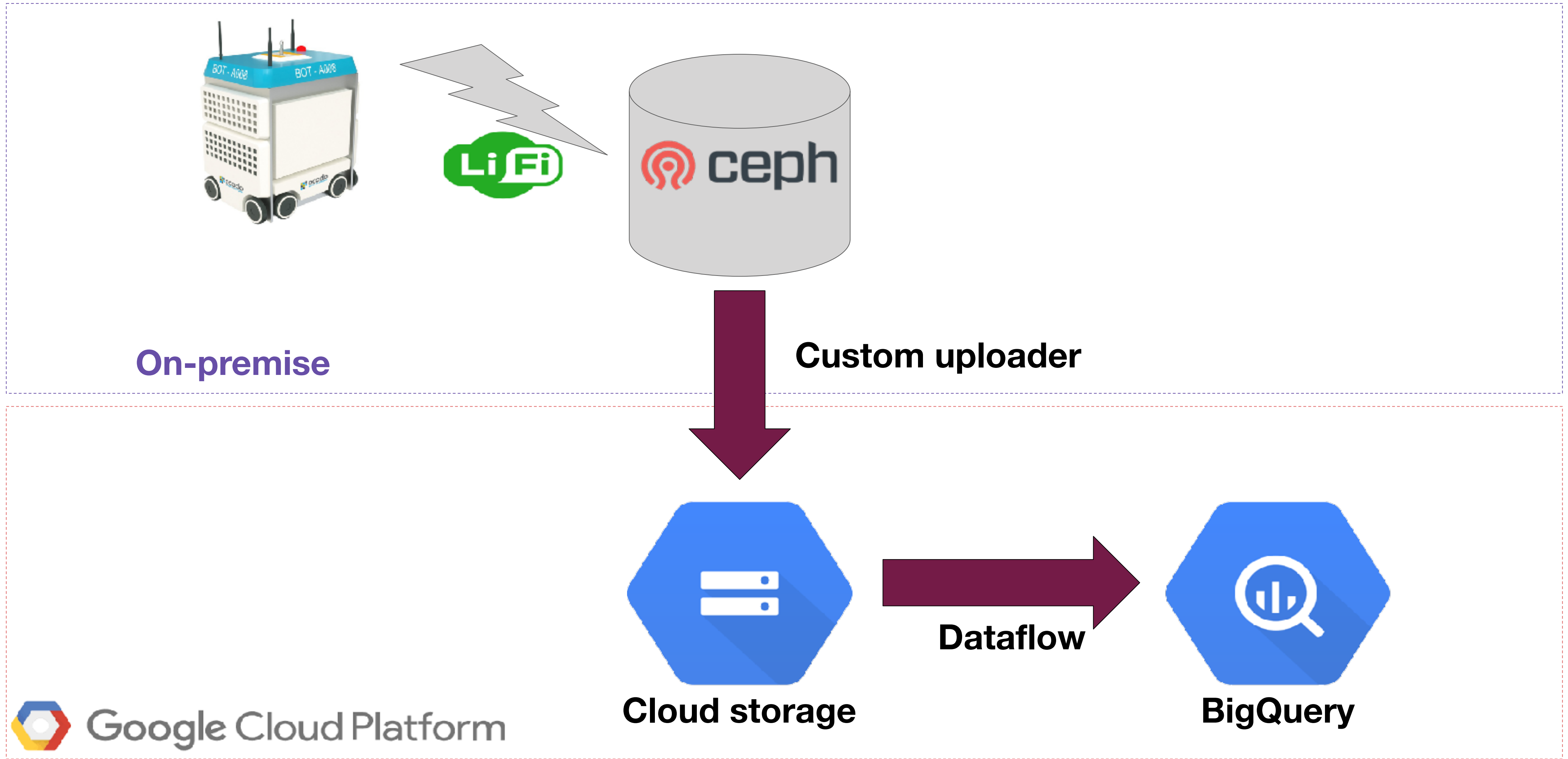
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Real Time Control System

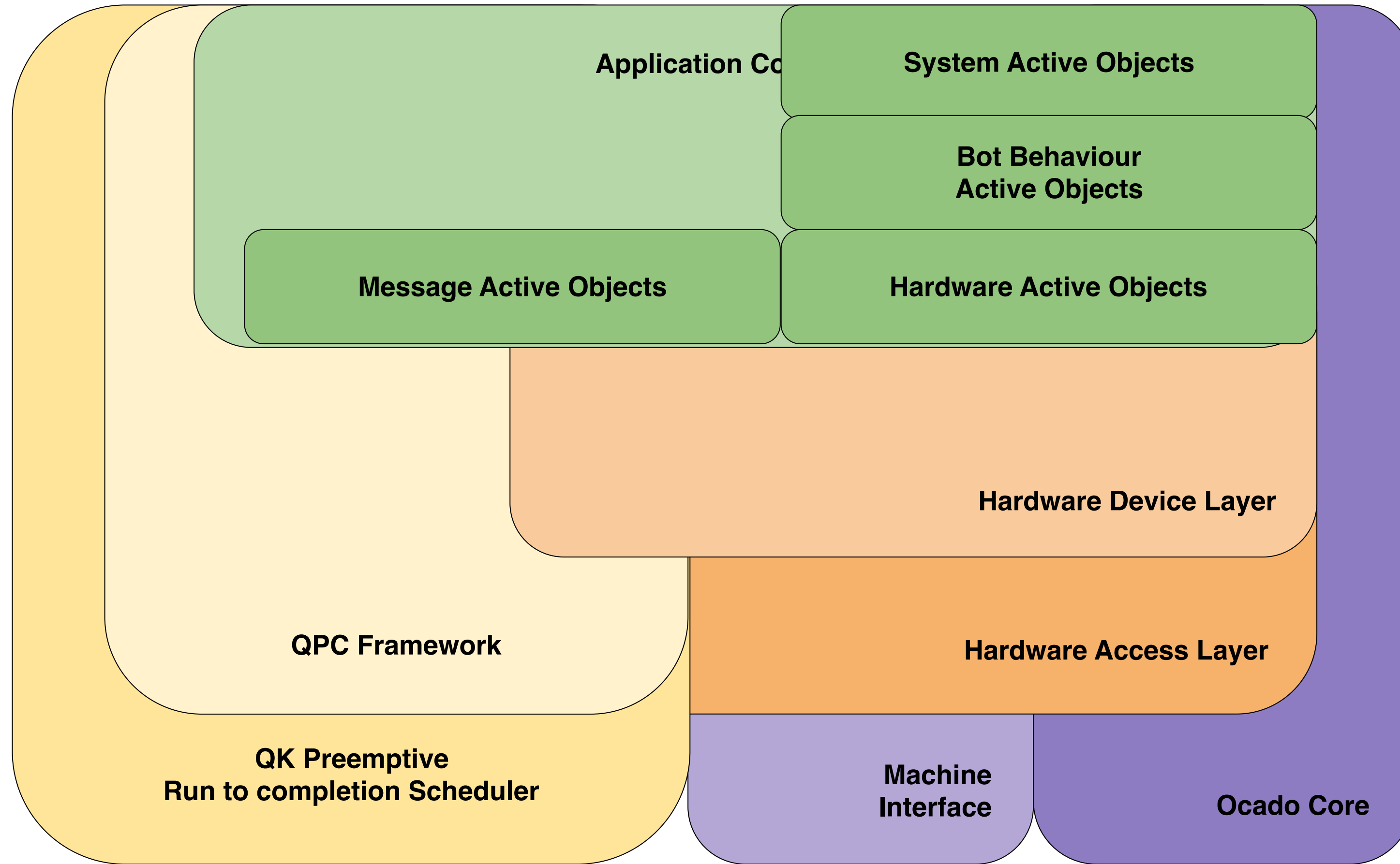


Real Time Control System



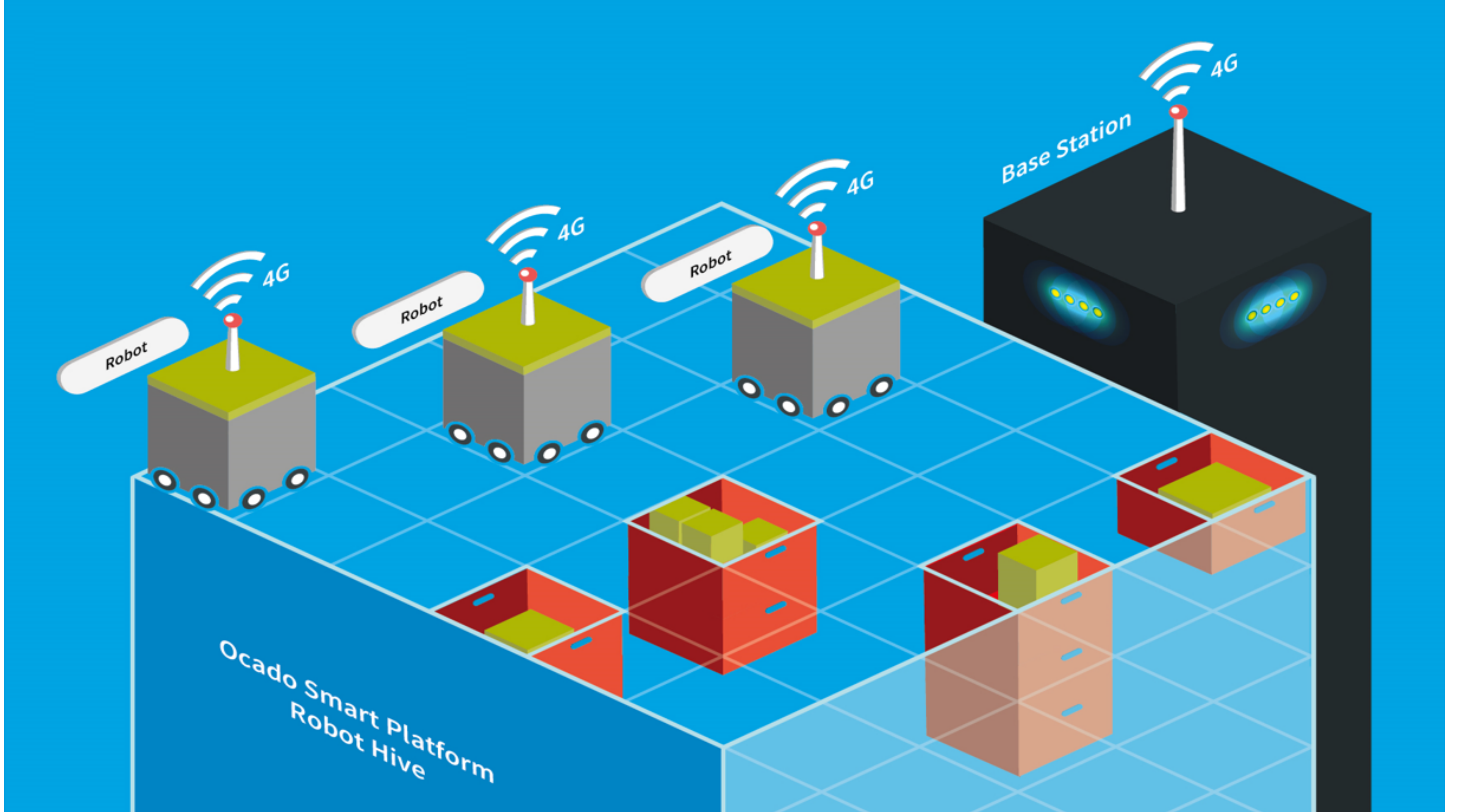


Embedded Stack Layer

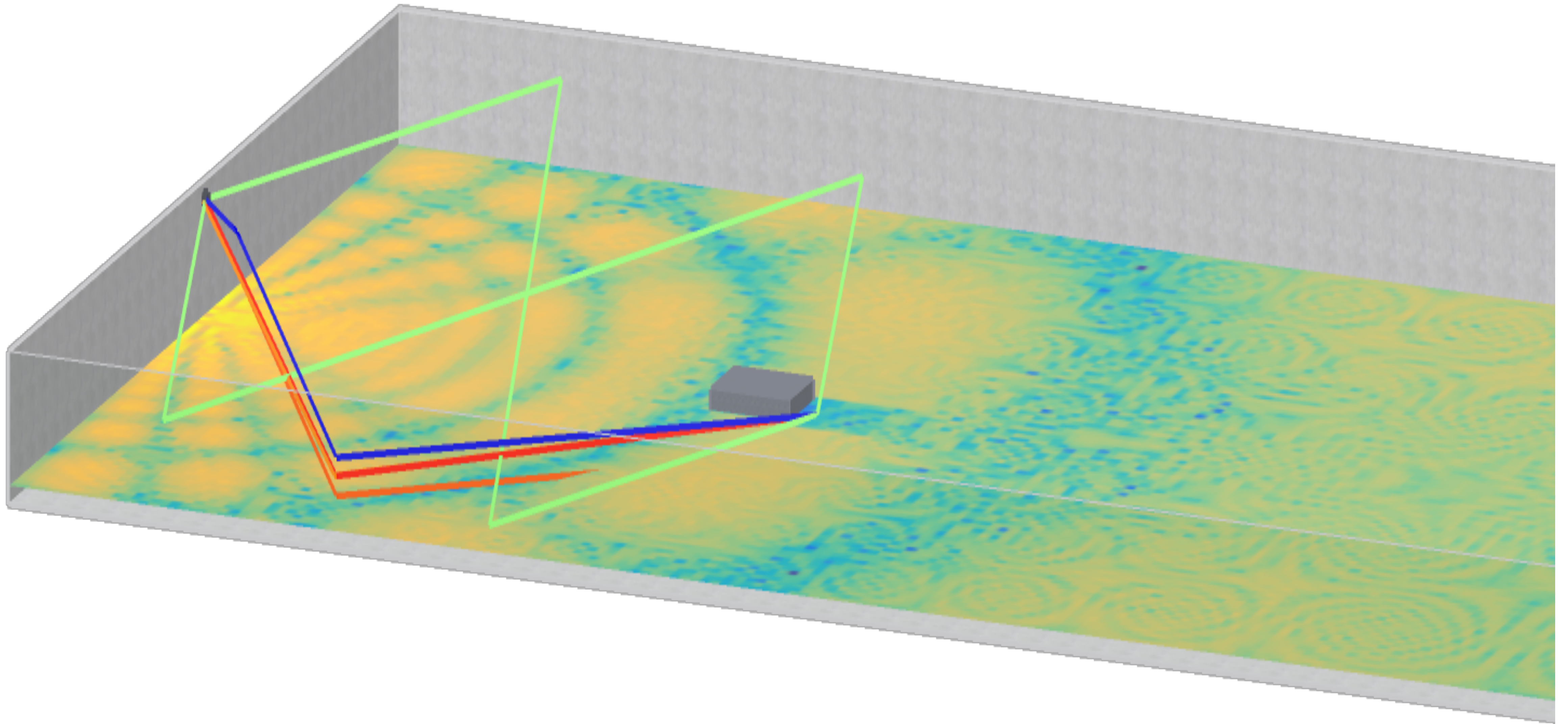


Bot Platform is based on an event based active object paradigm. Components (active objects) communicate in a decoupled nature using a publish/subscribe mechanism

Real Time Control System

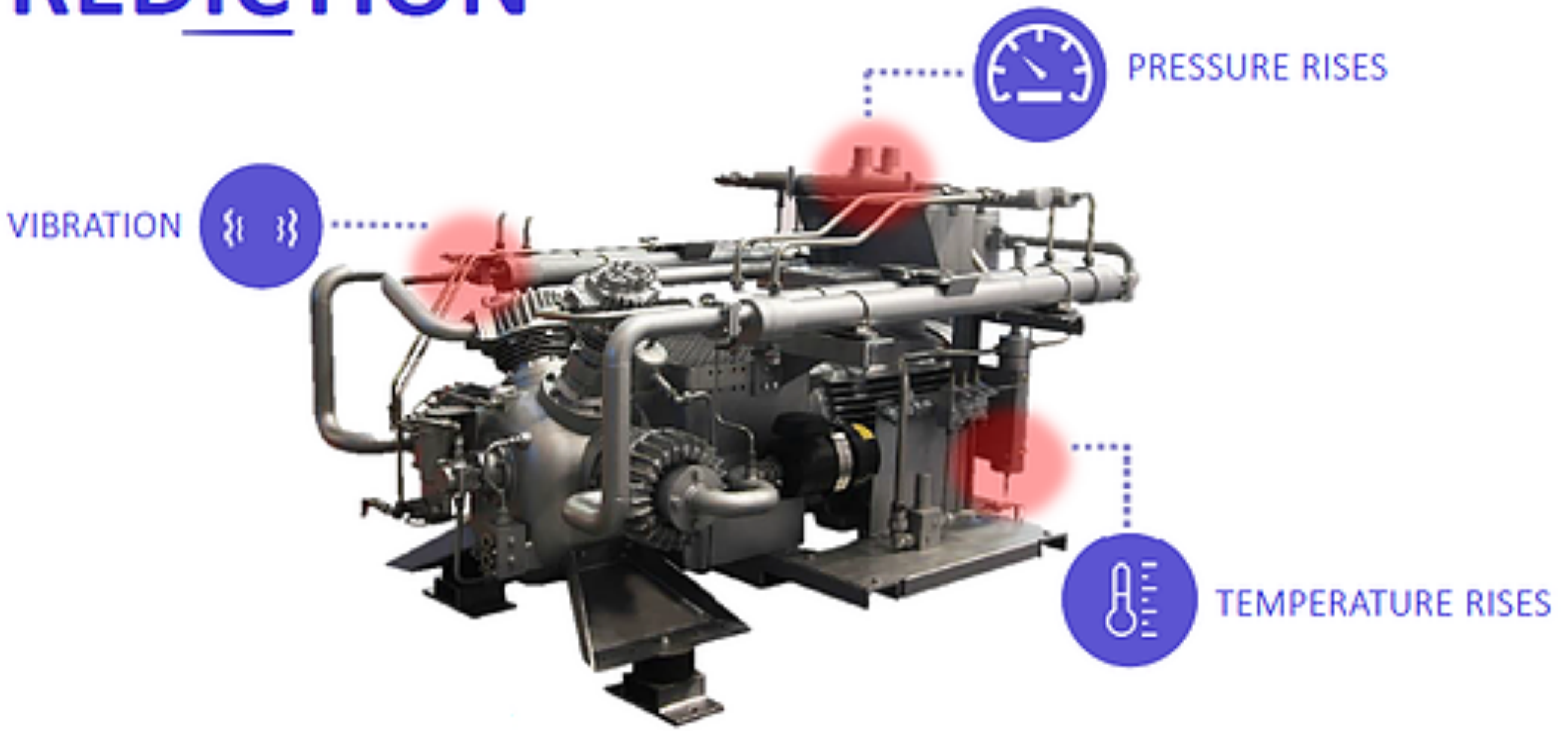


Real Time Control System

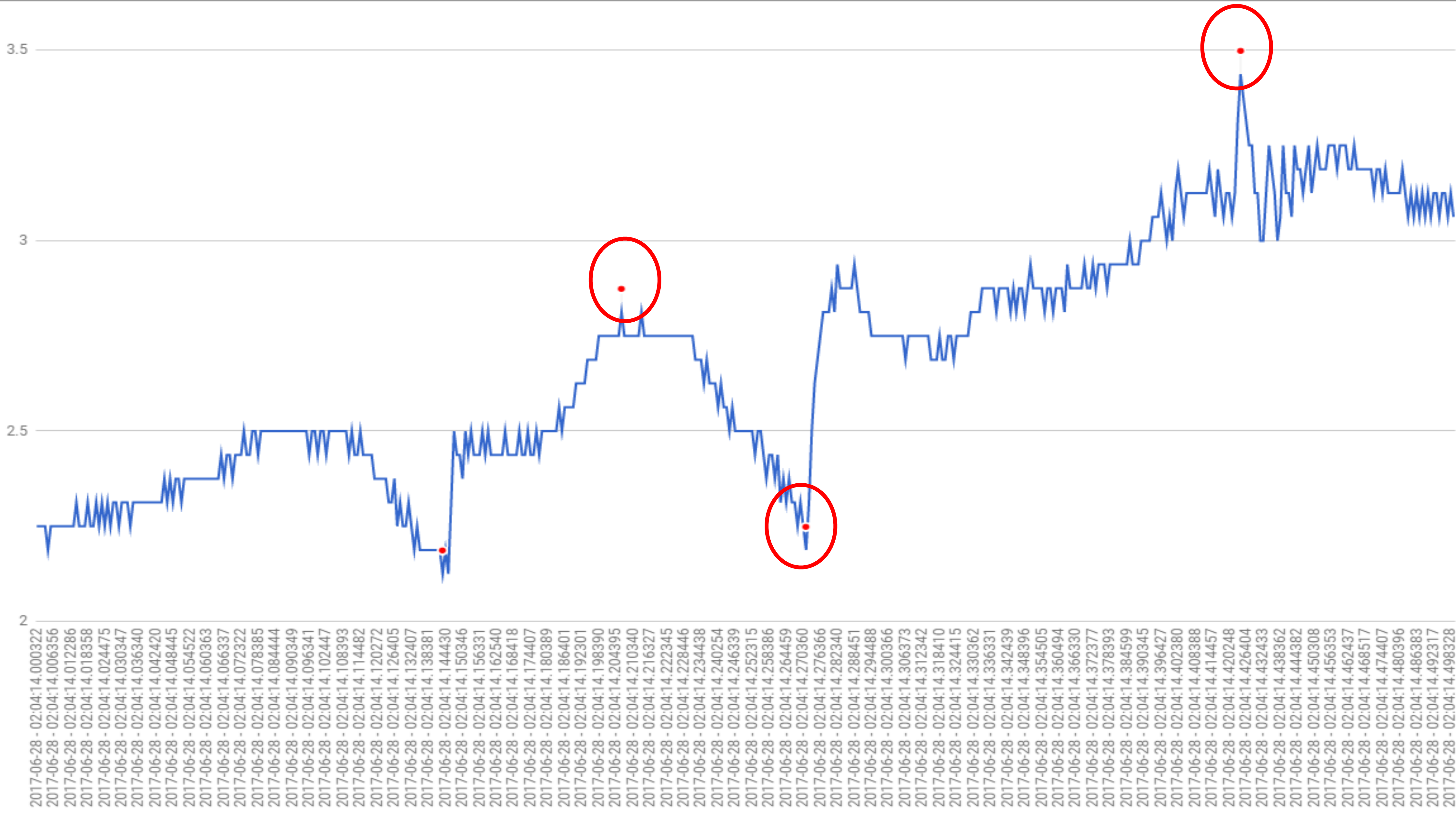


FAILURE PREDICTION

Data Platform

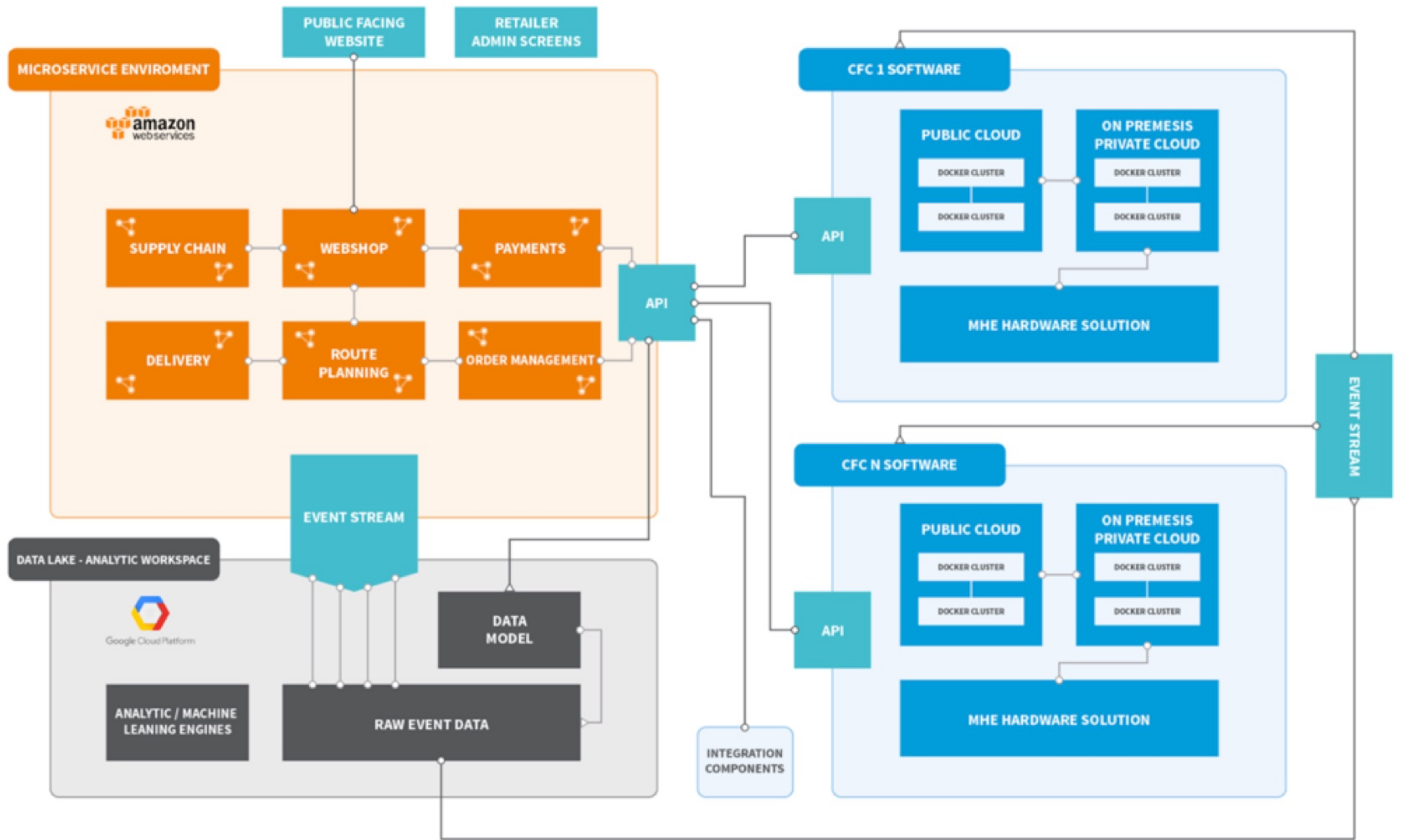


Data Platform



Data Platform







Thank you for listening.

