Case Study

DropBox

Logical View

Boundary

View

View Model

Model

Meta data

Control

Sync Service

Domain

? God

Chunk Service

Conflict Mgmt Service ?

NetworkService

Upload Download Service

Local Watcher

Cloud Watcher

Metadata Service

Boundary

Share Service
Or
ACL Service

Rdbms

Notification Service

?

File Service

Object
Storage

Ledger Service

Wide Column db
(column-family)

Million of rows
Query on multiple columns

Document
Store

Quota/ metering

Metadata Service

Rdbms

User Management

Rdbms

API

Domain

Data Access Layer

Upload Download Service

Chunk Service

Cloud Watcher

Quota/ metering ?

Pull during startup (catch up)
Push while running

Grpc

File Authorization Service <<API>>

Rdbms

File Service <<API>>

Object Storage

Metadata Service <<API>>

Rdbms

User Management <<API>>

Rdbms

Notification Service

Grpc

Should we ?

Audit Service

Wide column

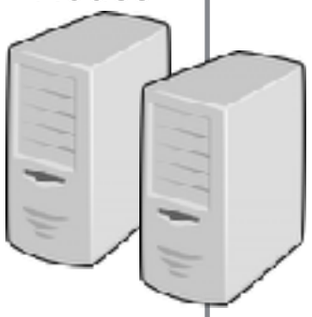
Firewall (TCP)

API Gateway /API Management / WAF (Http)

Load Balancer

Cluster

Nodes



Kubernetes ingress/ Istio Ingress / nginx reverse proxy

Notification Service

File Authorization Service <<API>>

Metadata Service <<API>>

User Management <<API>>

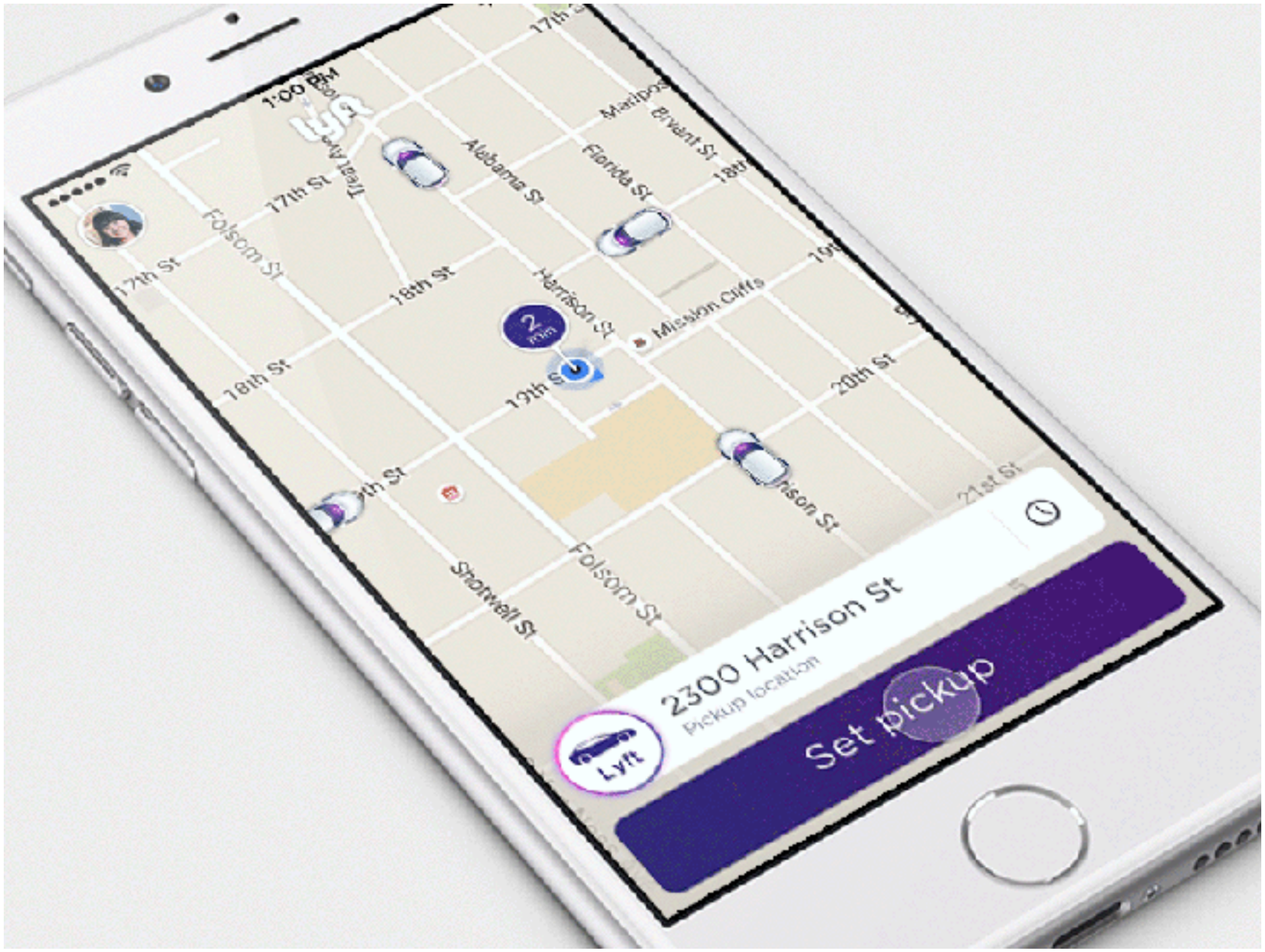
Object Storage

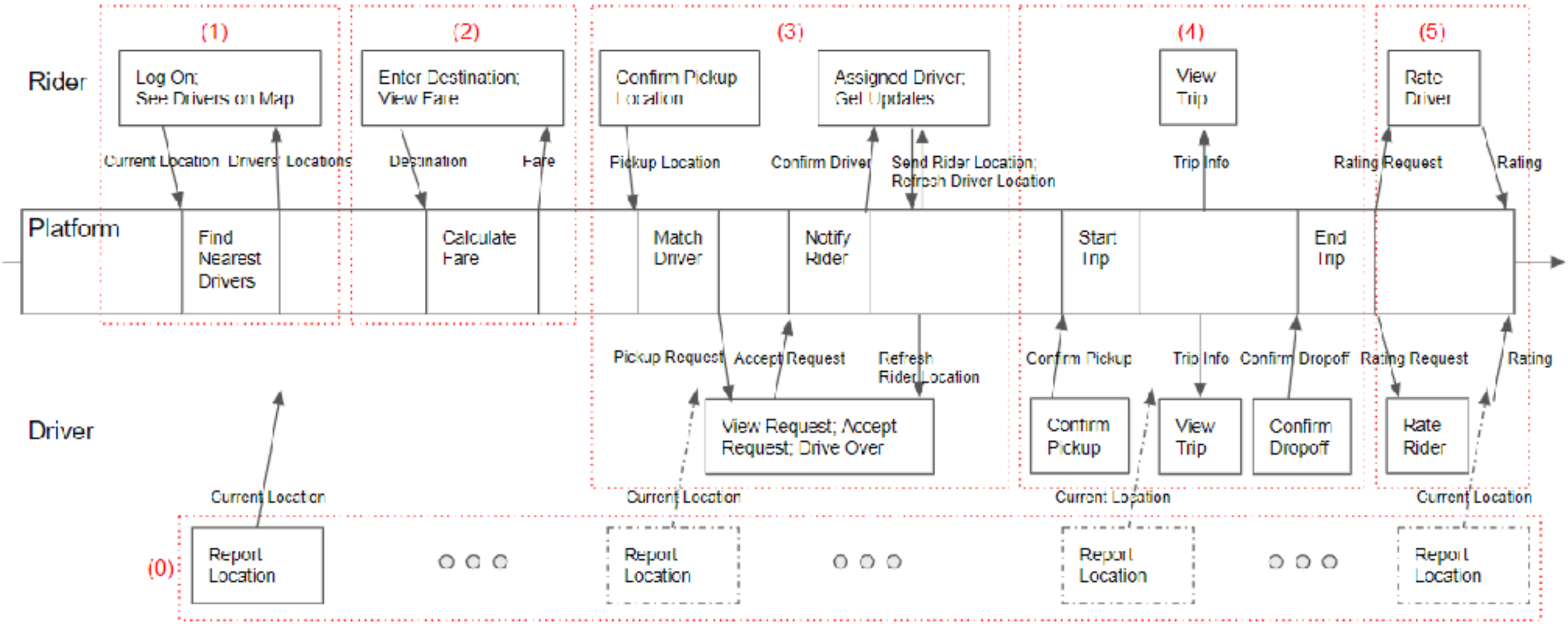
Wide column

Rdbms

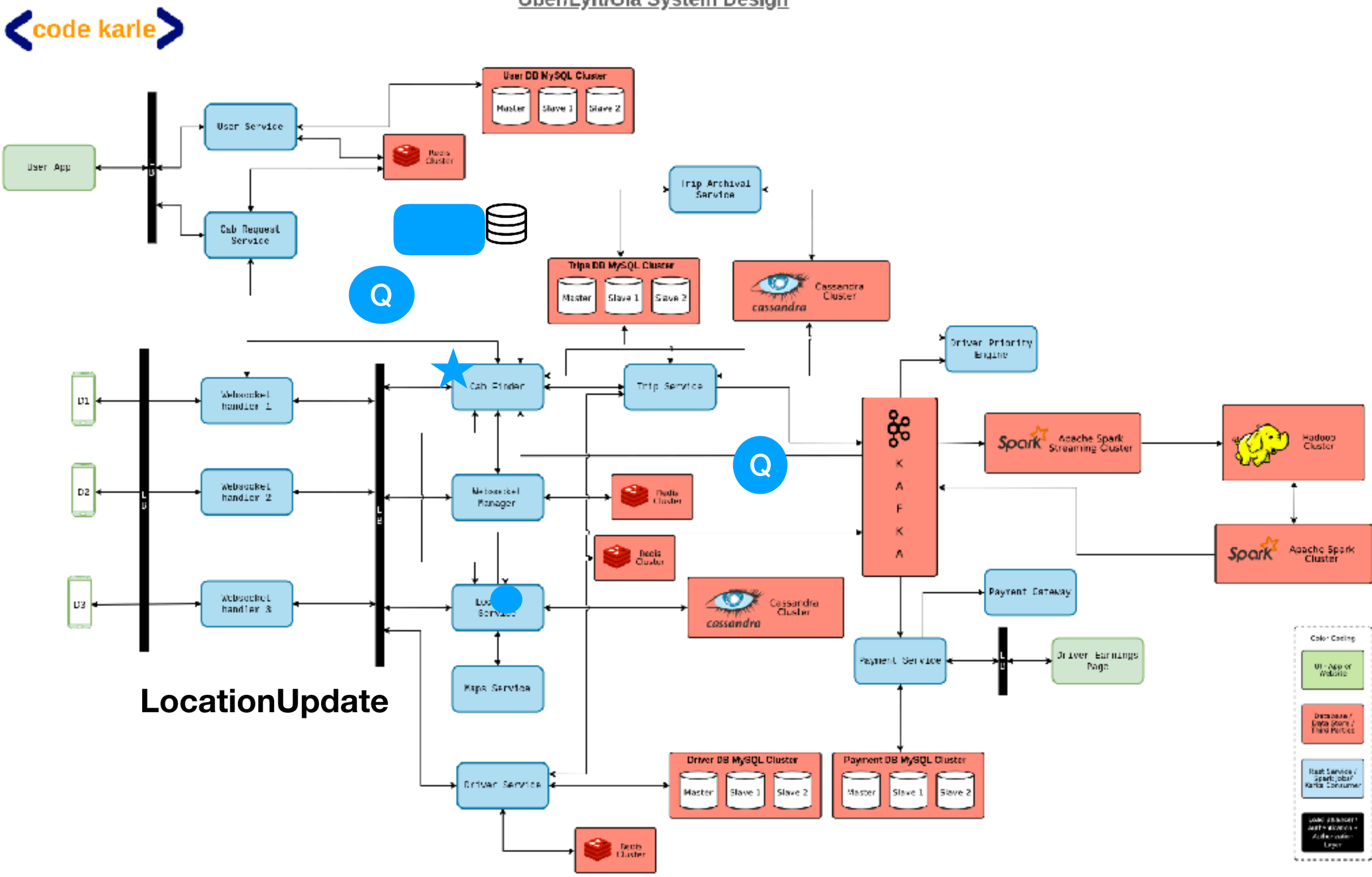
Message Queue

Uber reference architecture




(1)
(2)
(3)
(4)
(5)
Rider
Log On;
See Drivers on Map
Enter Destination;
View Fare
Confirm Pickup
Location
Assigned Driver;
Get Updates
View
Trip
Rate
Driver
Current Location
Drivers' Locations
Destination
Fare
Pickup Location
Confirm Driver
Send Rider Location;
Refresh Driver Location
Trip Info
Rating Request
Rating
Platform
Find
Nearest
Drivers
Calculate
Fare
Match
Driver
Notify
Rider
Start
Trip
End
Trip
Pickup Request
Accept Request
Refresh
Rider Location
Confirm Pickup
Trip Info
Confirm Dropoff
Rating Request
Rating
Driver
View Request; Accept
Request; Drive Over
Confirm
Pickup
View
Trip
Confirm
Dropoff
Rate
Rider
Current Location
Current Location
Current Location
Current Location
(0)
Report
Location
Report
Location
Report
Location
Report
Location

Uber/Lyft/Ola System Design



1.collect Telemetry

2.secure

3. Analyse

Customer

Device

Feature engineering
Masking
Anonymoization

Device

Gateway

Internet

wss

wss

mqtt

Message engine (7)

Stream Analytics

Analytics

Csv

clustering
sequence modelling
…

Batch Analytics

Object Storage

Device

APi

Wide column

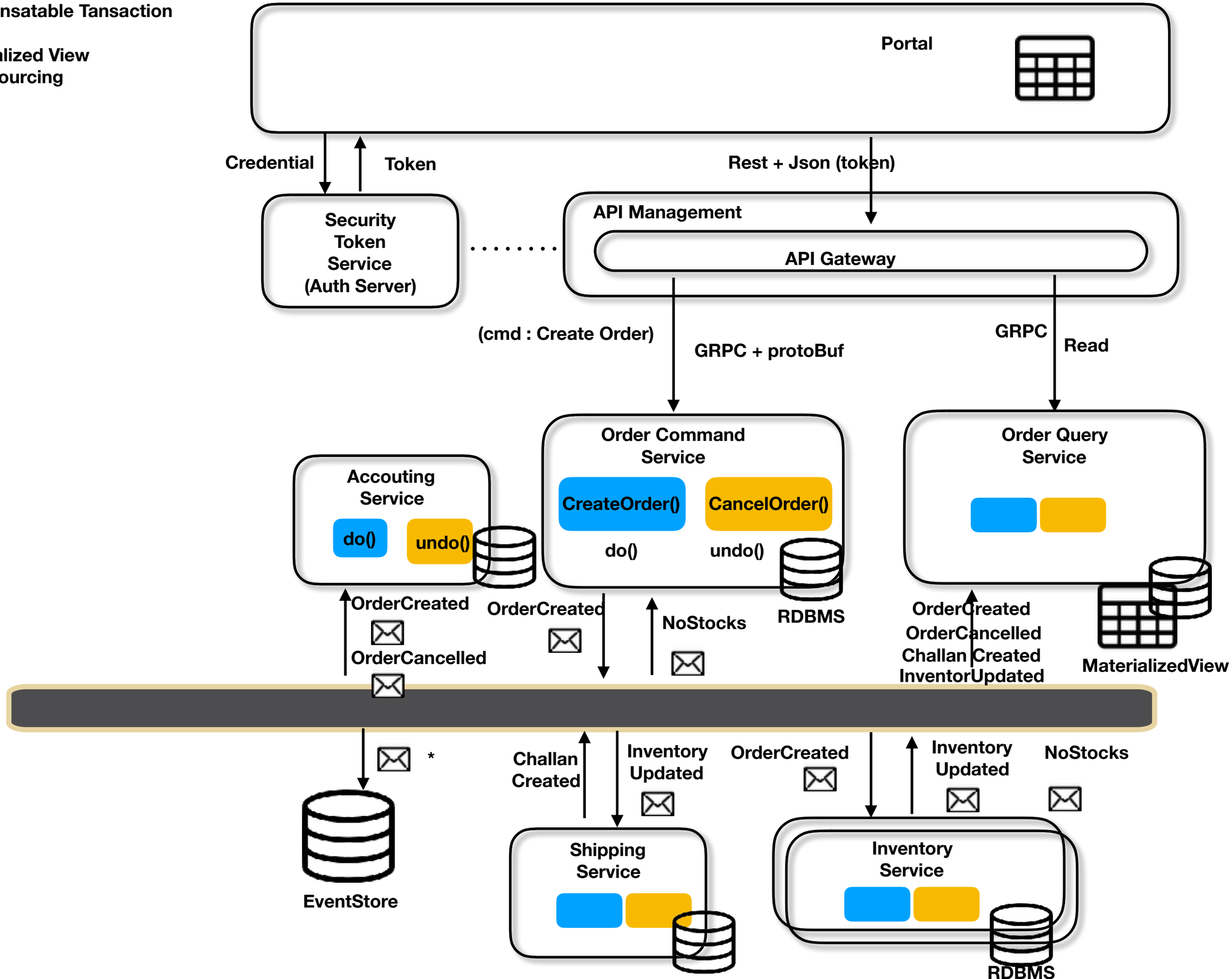
Tableu
Looker
Power Bi

Reporting server

DWH

Business User

Compensatable Tansaction
SAGA
Materialized View
EventSourcing



Rest

Property Search Service

Rest

Property Service

Rest

Booking Service

Booking History Service

API

Domain

Data

API

Domain

Data

API

Domain

Data

API

Domain

Data

?

?

?

Text

Document

File storage

Rdbms

Wide Column

?

?

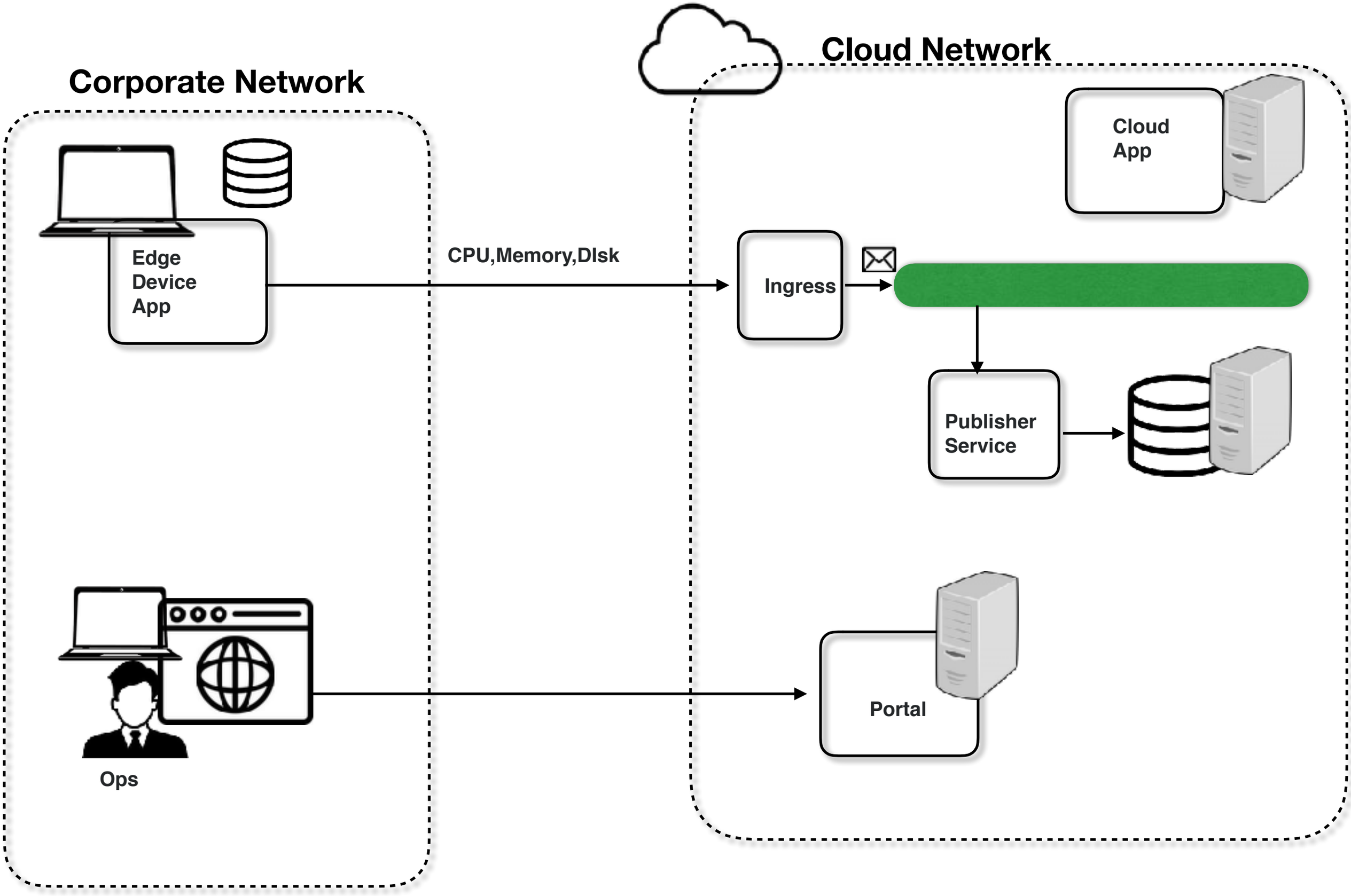
Data Lake

Landing Zone

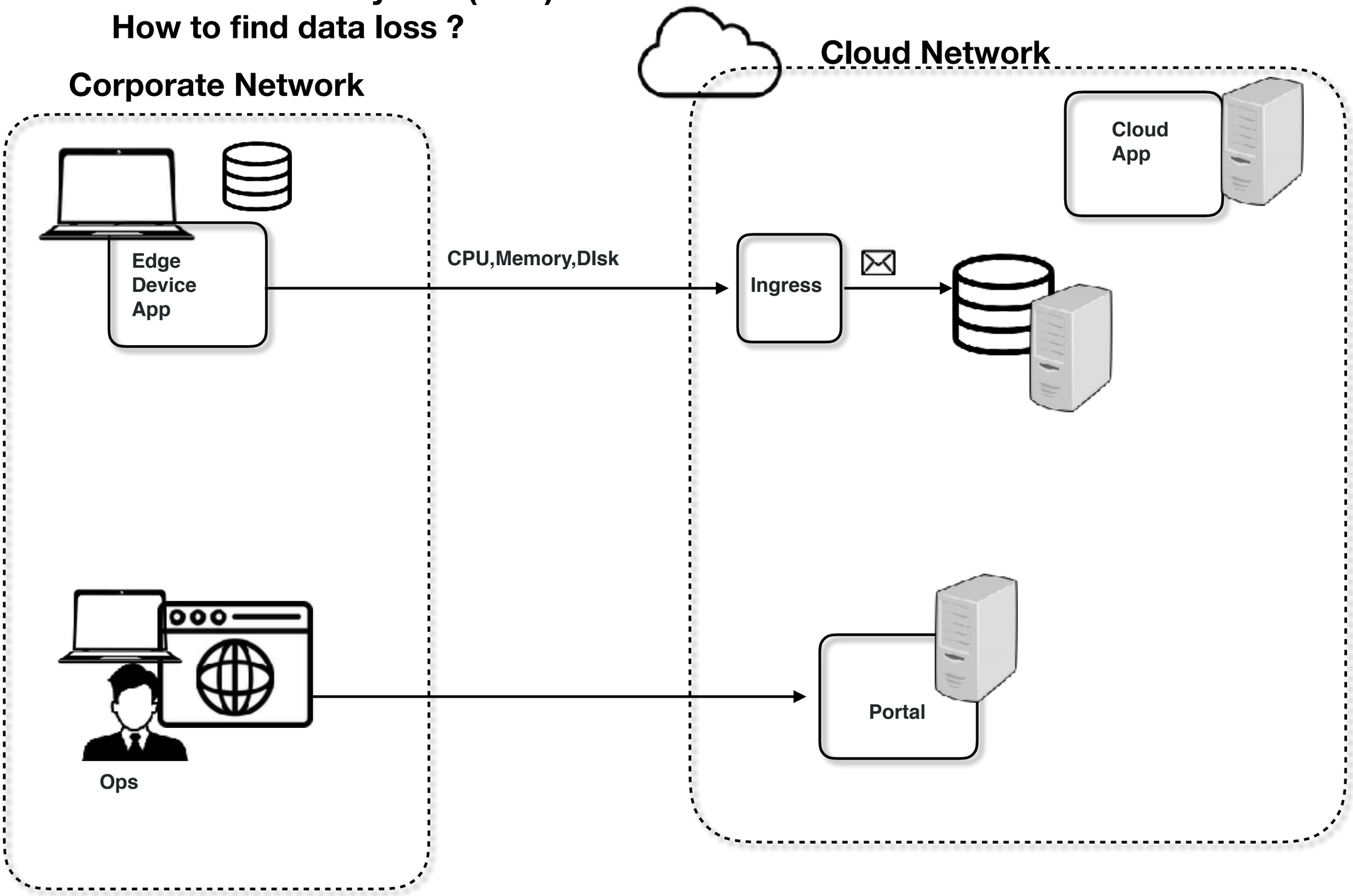
Staging Zone

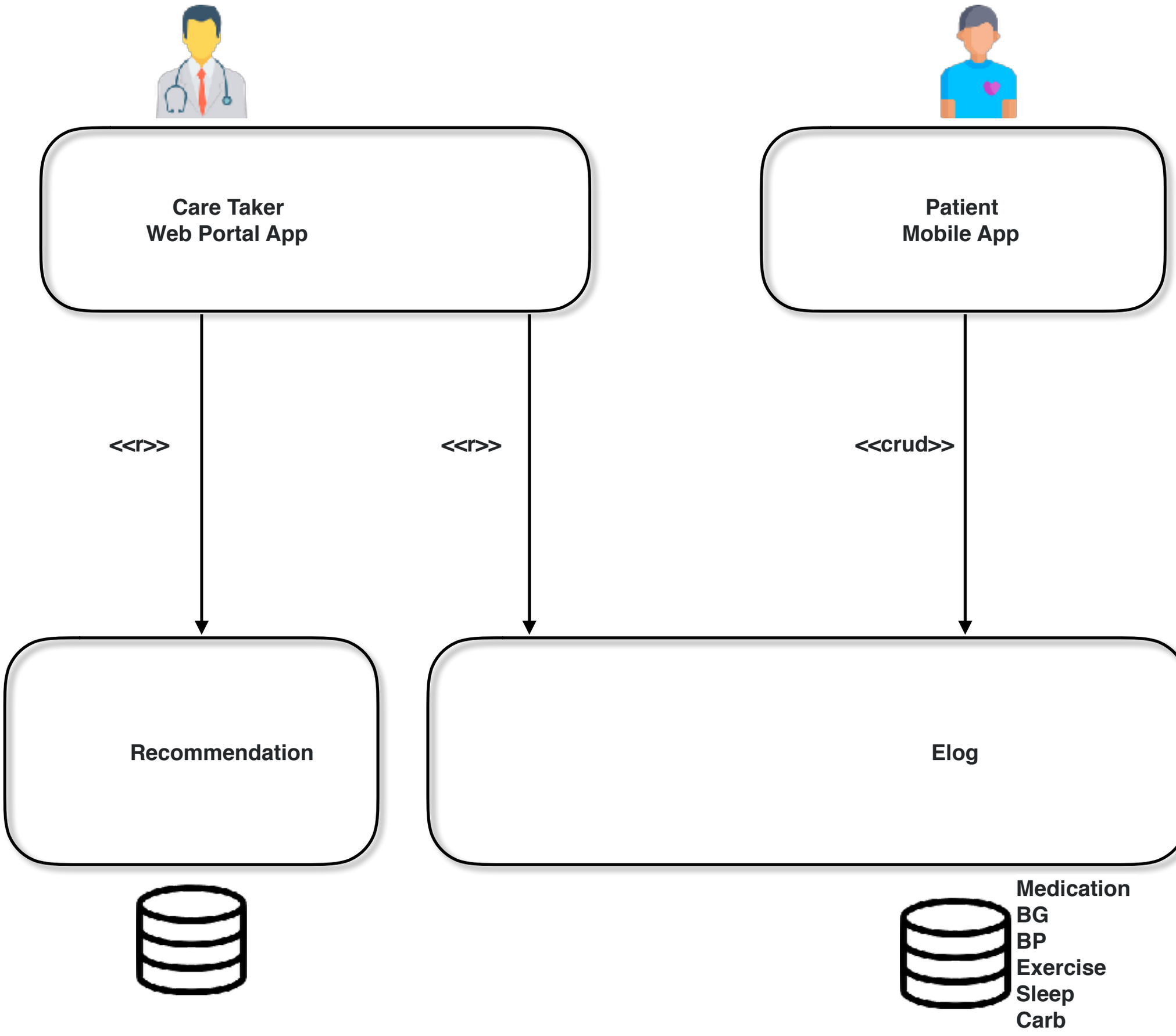
Reporting Zone

Analytical Service


Corporate Network
Cloud Network
Edge
Device
App
CPU,Memory,DIsk
Ingress
Cloud
App
Publisher
Service
Ops
Portal

Which database ?
Where to do analysis ? (70%)
How to find data loss ?





separate Create and view recommendation

Care Taker
Web Portal App

Patient
Mobile App

<<r>>

Rest Api

<<r>>

Rest Api

<<crud>>

Rest Api

Notification
Engine ?

Recommendation
Query Service

Elog Service

Messages

Document

Document

Medication
BG
BP
Exercise
Sleep
Carb
...

Recommendation
Engine

(+ time_series)

?

Care Taker
Web Portal App

Patient
Mobile App

<<r>>

Rest Api

<<r>>

Rest Api

<<crud>>

Rest Api

Notification
Engine ?

Recommendation
Query Service

Elog Service

Messages

Document

Pull

Document

Medication
BG
BP
Exercise
Sleep
Carb
...

Recommendation
Engine

CDC (push)

(+ time_series)

?

Care Taker
Web Portal App

ANGULAR

Patient
Mobile App

<<r>>

Rest Api

<<r>>

Rest Api

<<crud>>

Rest Api

Notification
Engine ?

Recommendation
Query Service

Flask

Elog Service

spring

Messages

Document

Medication
BG
BP
Exercise
Sleep
Carb
...

Document

Publisher

Egress

Object Storage

(DataLake)

Recommendation
Engine

Spark

SQL `SELECT BookName, SUM(Sales) FROM BookSales GROUPBY BookName`

MapReduce

ID	BookName	Sales
4	Book A	2
5	Book B	8
6	Book C	1
7	Book B	6

ID	BookName	Sales
2	Book B	15
3	Book A	2
4	Book C	7
5	Book A	1

ID	BookName	Sales
5	Book C	4
6	Book A	3
7	Book B	9
8	Book C	11

Map →

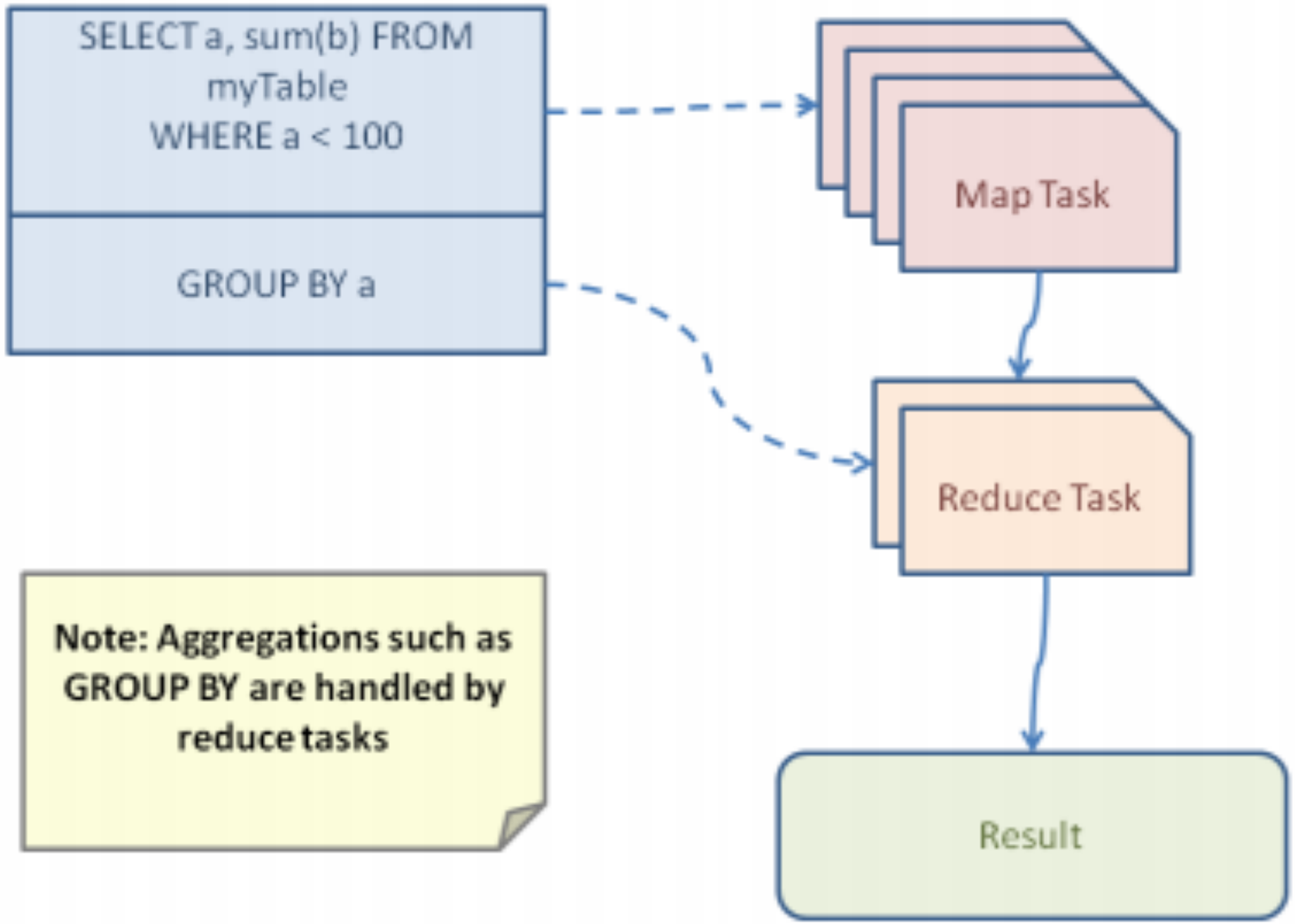
Key	Value
Book A	2
Book A	2
Book A	3
Book A	1

Key	Value
Book B	15
Book B	8
Book B	6
Book B	9

Key	Value
Book C	4
Book C	1
Book C	7
Book C	11

Reduce →

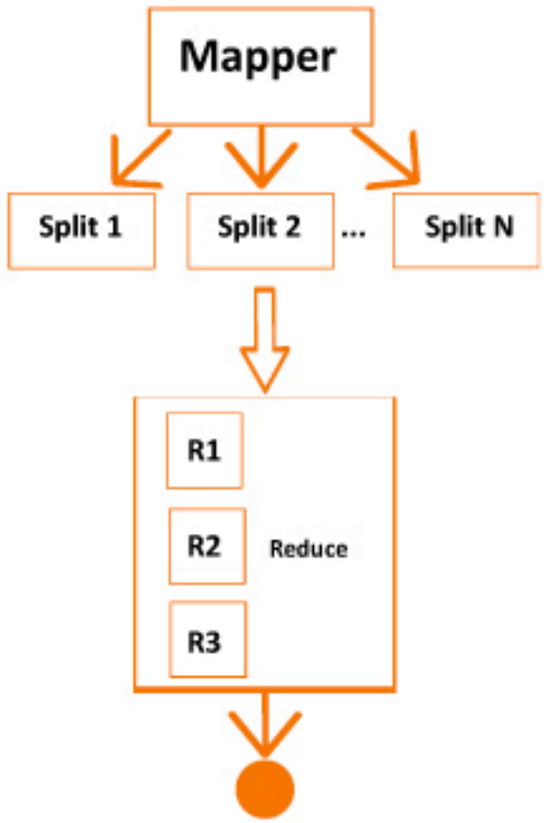
Key	Value
Book A	8
Book B	38
Book C	23



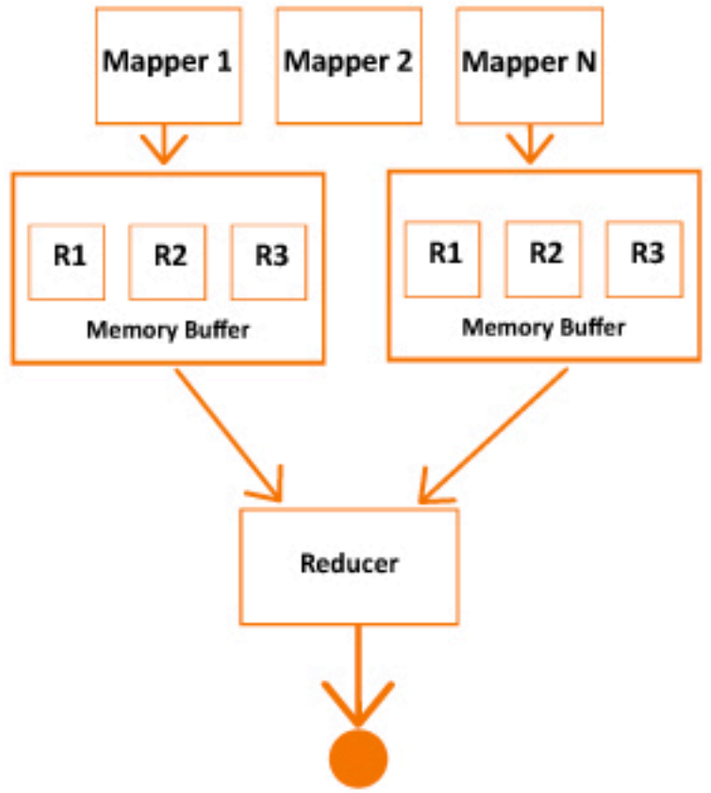
Note: Aggregations such as GROUP BY are handled by reduce tasks

Haddop Ecosystem

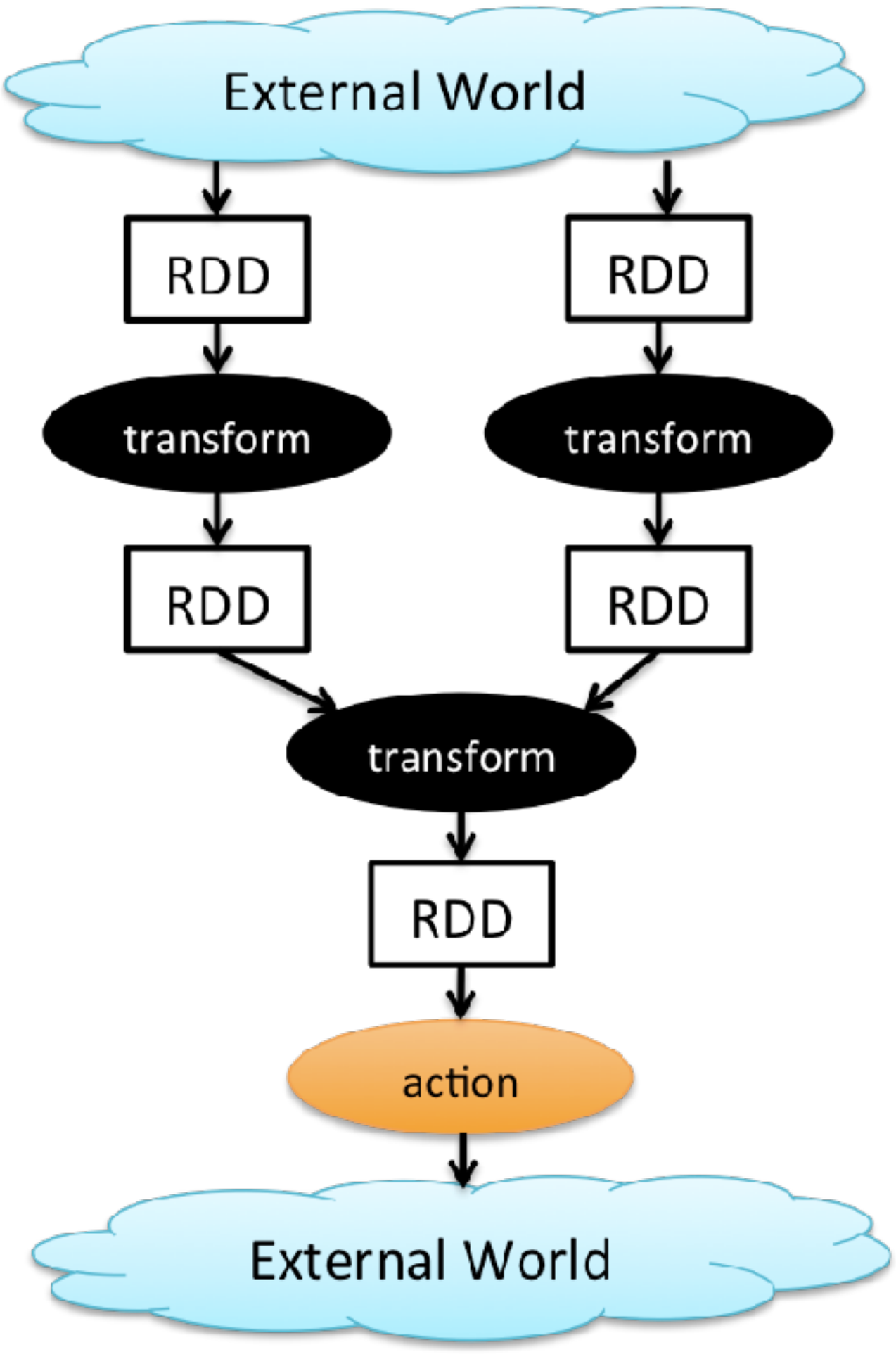
Haddop

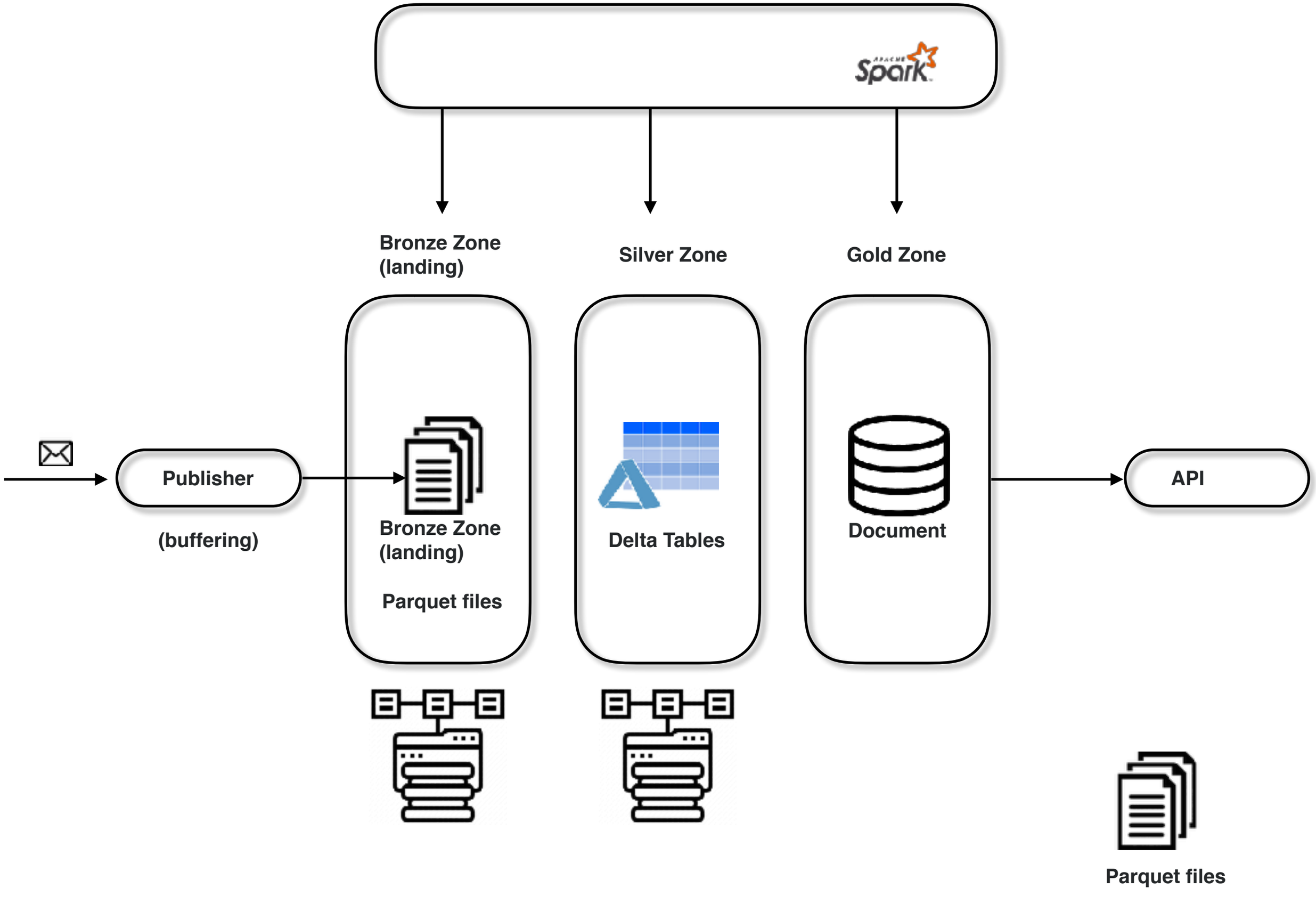


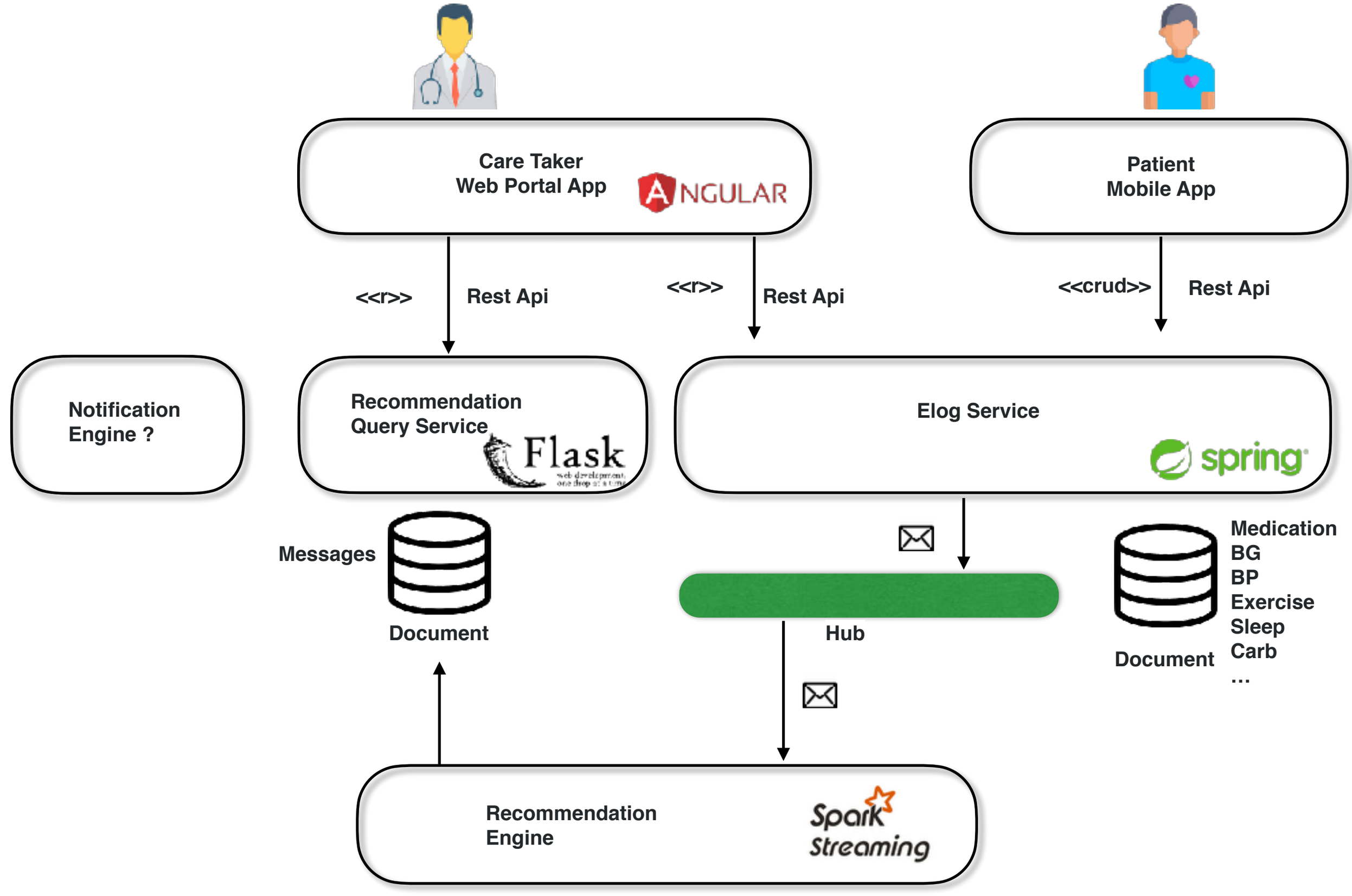
Spark

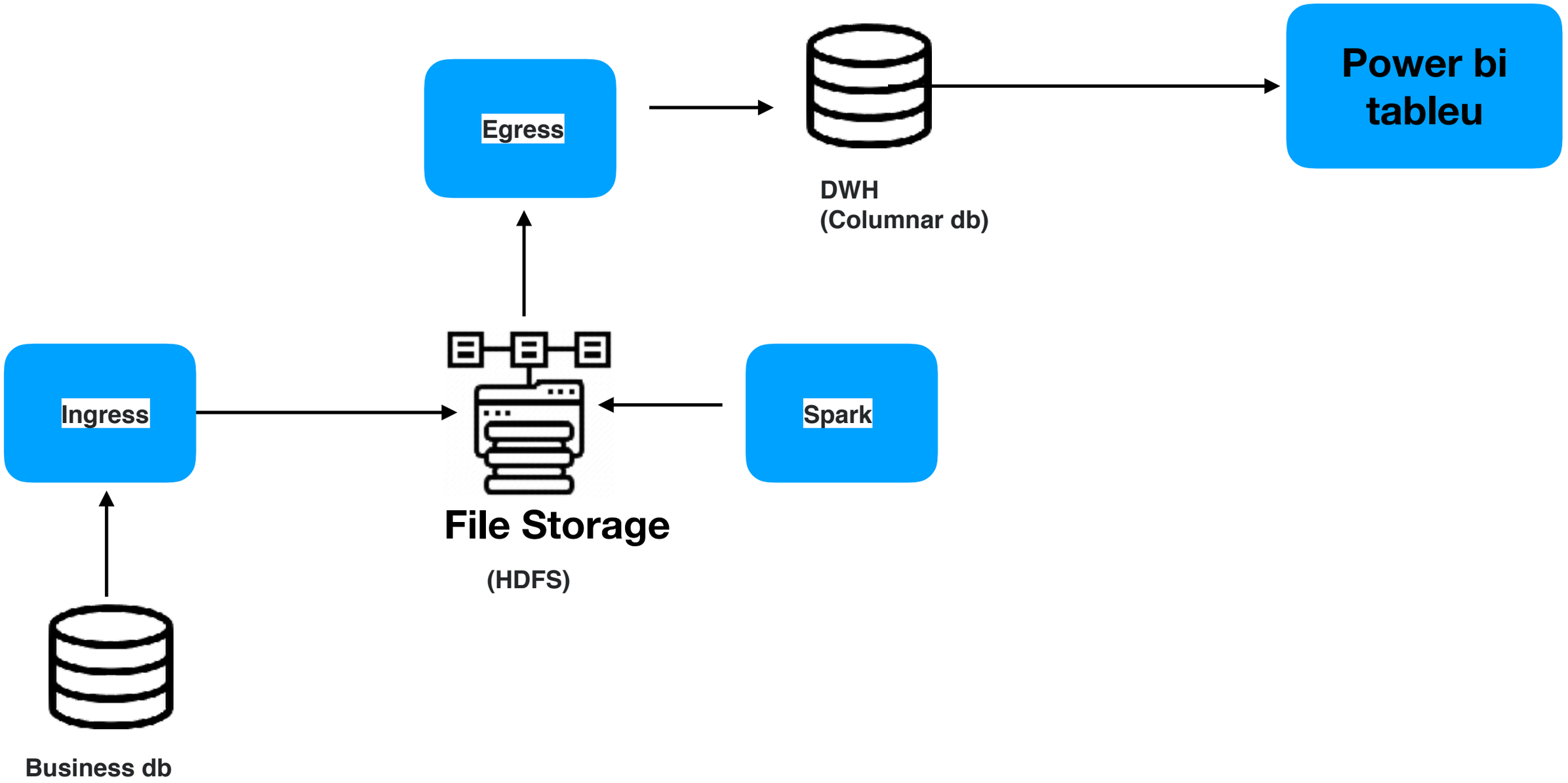


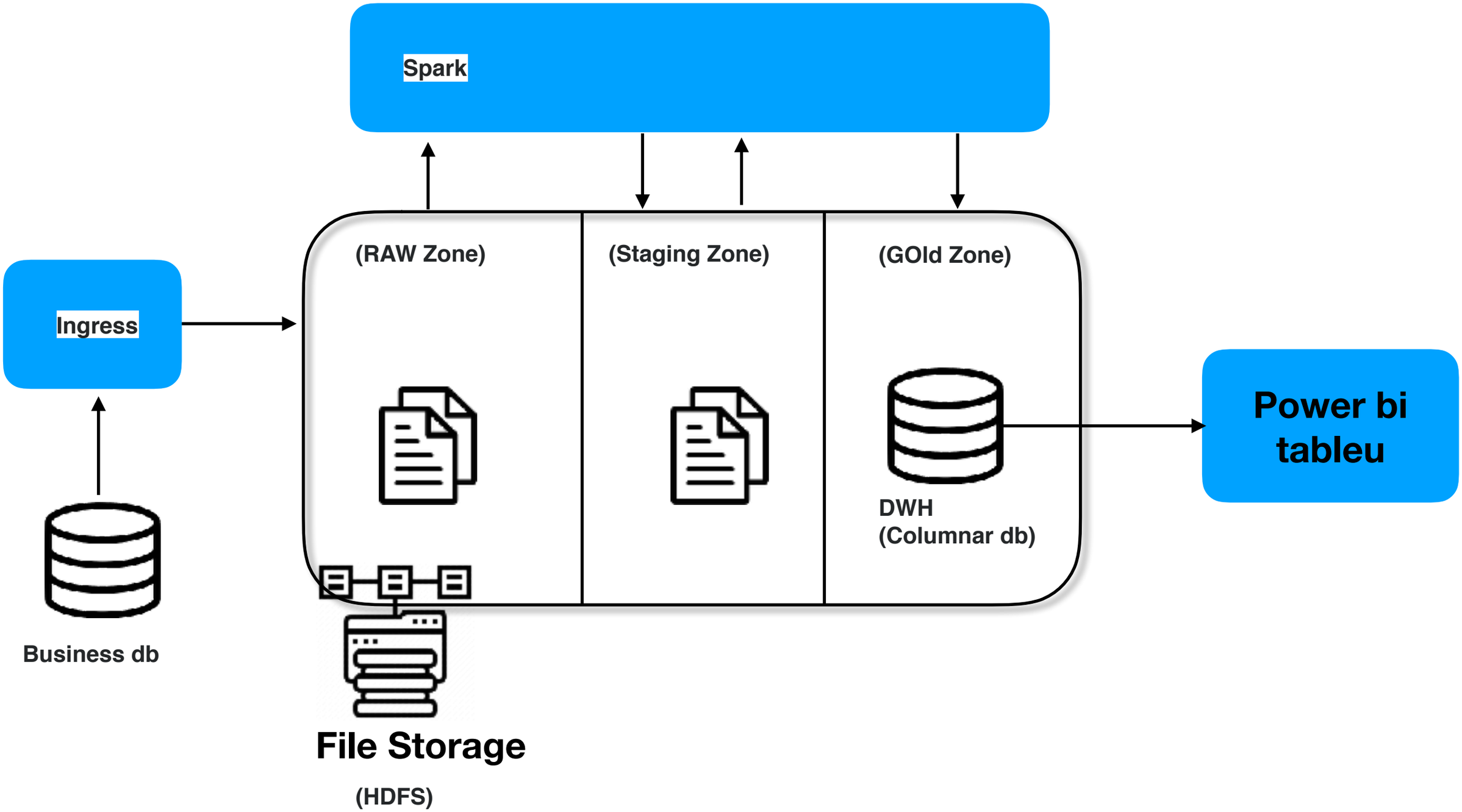
user code containing RDD transformations forms Direct Acyclic Graph

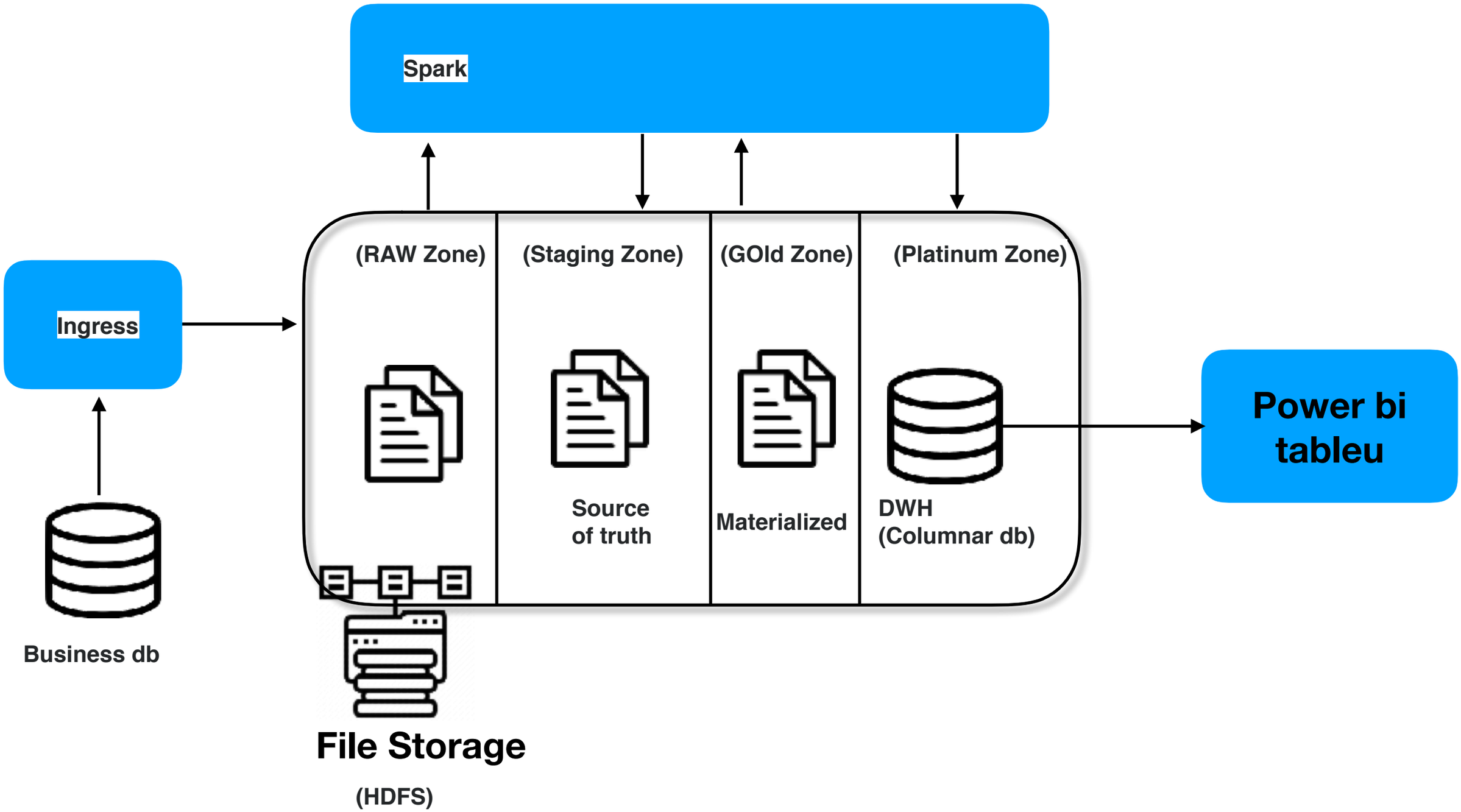


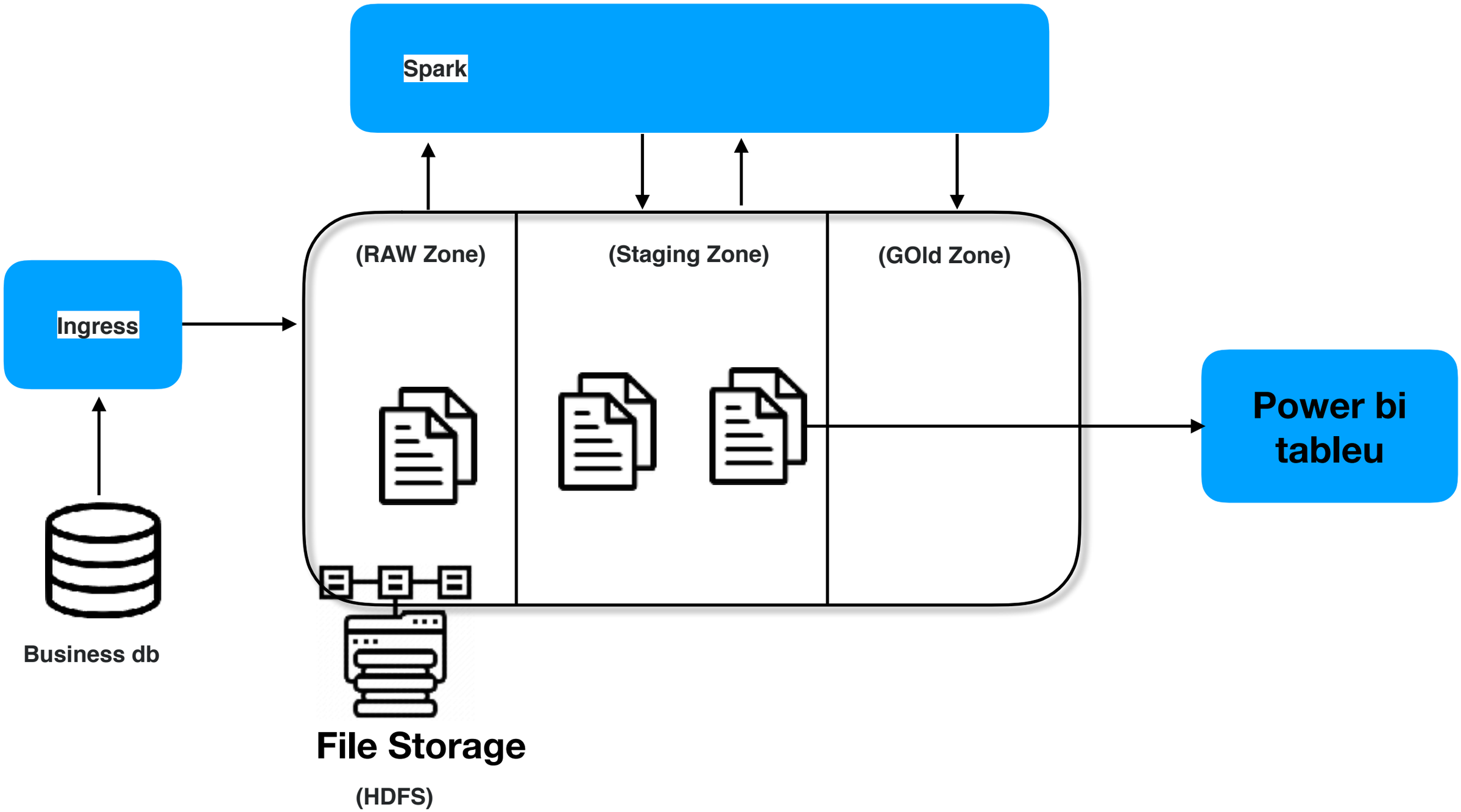

Bronze Zone
(landing)
Silver Zone
Gold Zone
Publisher
(buffering)
Bronze Zone
(landing)
Parquet files
Delta Tables
Document
API
Parquet files


Care Taker
Web Portal App
ANGULAR
Patient
Mobile App
<<r>>
Rest Api
<<r>>
Rest Api
<<crud>>
Rest Api
Notification
Engine ?
Recommendation
Query Service
Flask
Elog Service
spring
Messages
Document
Hub
Medication
BG
BP
Exercise
Sleep
Carb
...
Document
Recommendation
Engine
Spark
Streaming

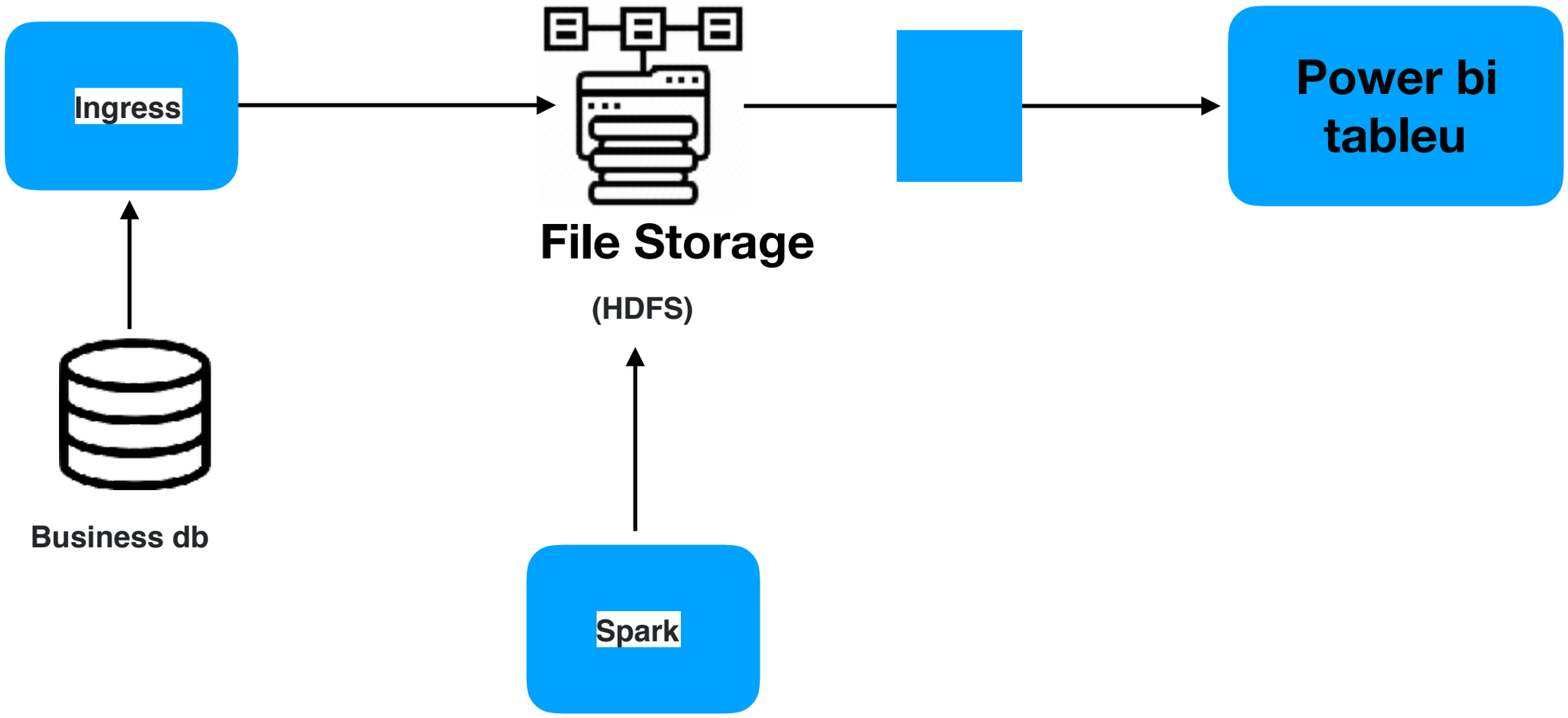

Egress
DWH
(Columnar db)
Power bi
tableu
Ingress
Spark
File Storage
(HDFS)
Business db

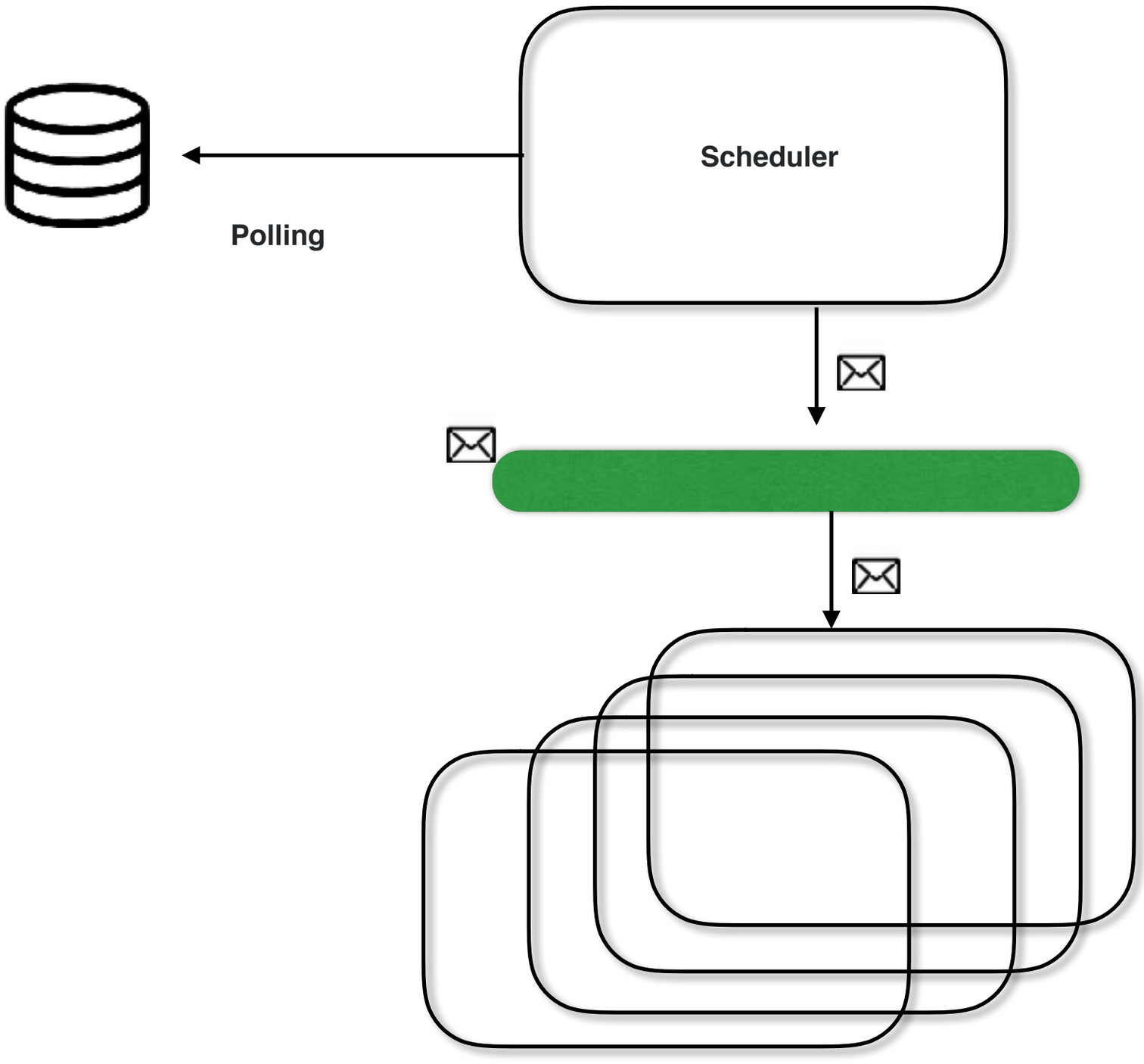

Spark
Ingress
(RAW Zone)
(Staging Zone)
(GOld Zone)
Power bi
tableu
DWH
(Columnar db)
Business db
File Storage
(HDFS)

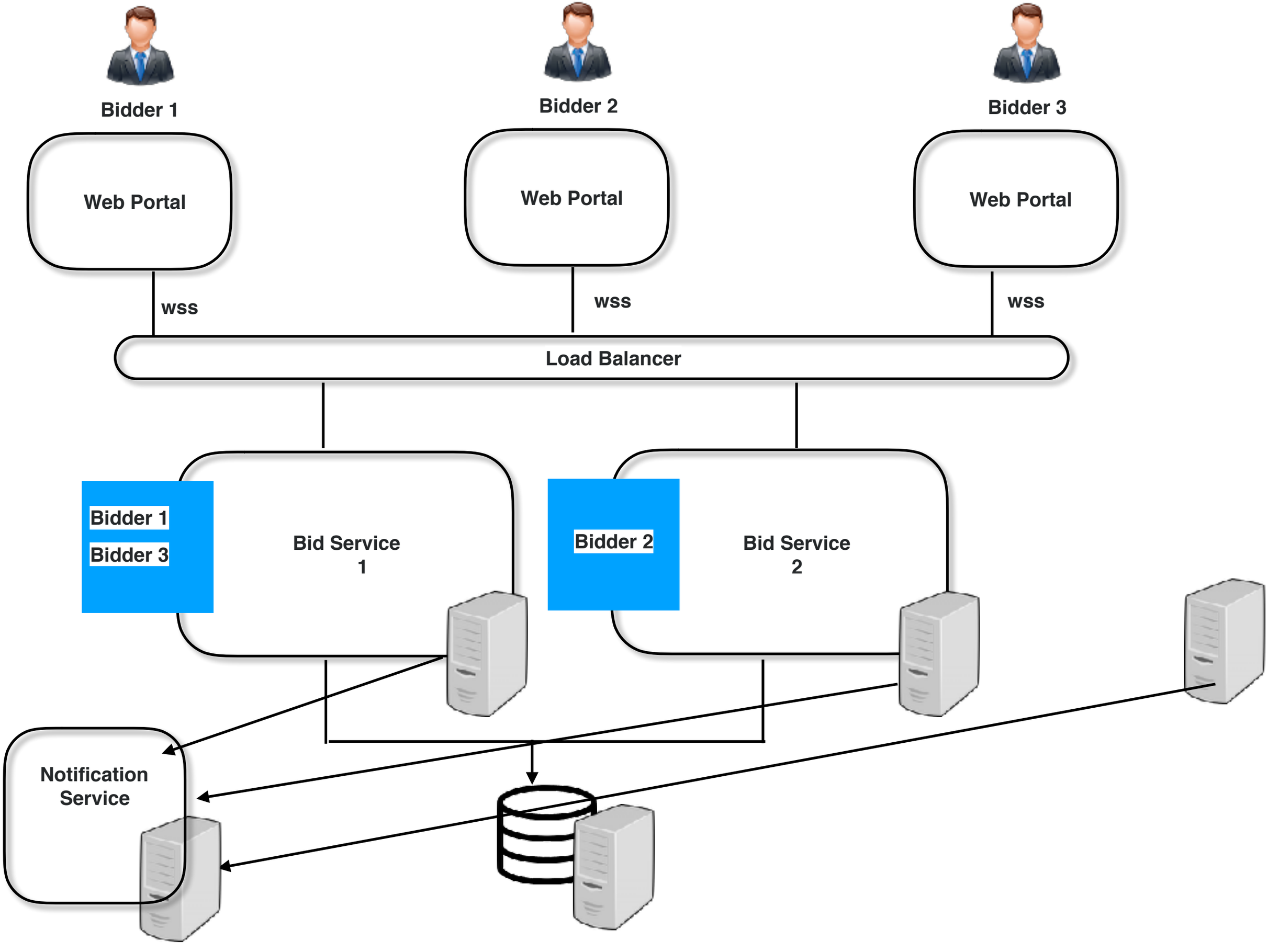

Spark
Ingress
(RAW Zone)
(Staging Zone)
(GOld Zone)
(Platinum Zone)
Source
of truth
Materialized
DWH
(Columnar db)
Power bi
tableu
Business db
File Storage
(HDFS)

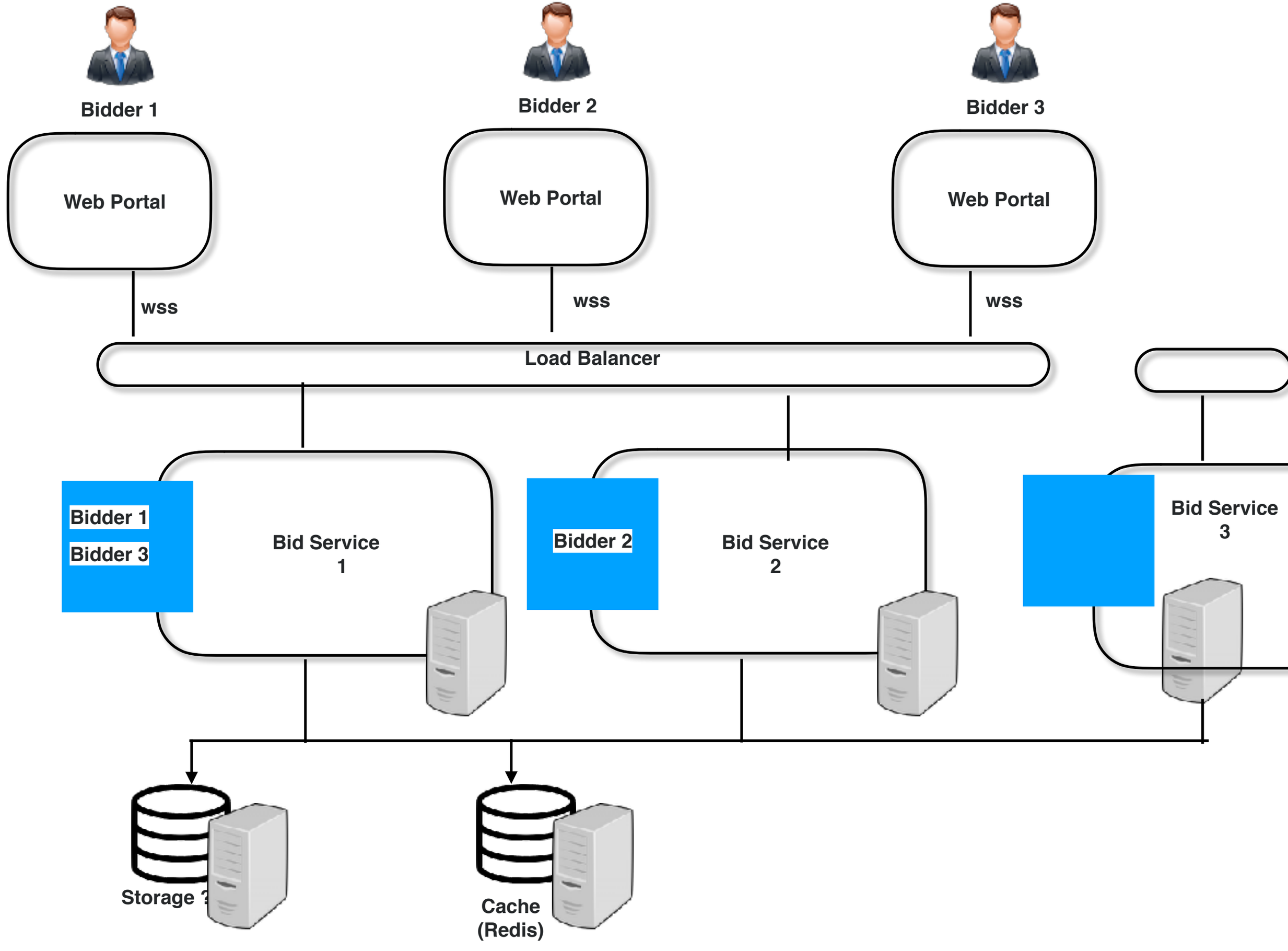

Spark
Ingress
(RAW Zone)
(Staging Zone)
(GOld Zone)
Power bi
tableu
Business db
File Storage
(HDFS)

Lake House
(Databricks)




Scheduler
Polling


Bidder 1
Bidder 2
Bidder 3
Web Portal
Web Portal
Web Portal
wss
wss
wss
Load Balancer
Bidder 1
Bidder 3
Bid Service
1
Bidder 2
Bid Service
2
Notification
Service


Bidder 1
Bidder 2
Bidder 3
Web Portal
Web Portal
Web Portal
wss
wss
wss
Load Balancer
Bidder 1
Bidder 3
Bid Service
1
Bidder 2
Bid Service
2
Bid Service
3
Storage
Cache
(Redis)

Portal

View

Controller

Model

Property Listing

API

Domain

Data

Object Store

Document

Property Booking

Current Booking

RDBMS

Booking History

Wide Column

Property Search

Text

Portal

View

Controller

Model

Create Property

Search Property

Property Listing

Property Search

API

Domain

Data

Object Store

Document

CDC

Text

Portal

View

Controller

Model

Create Property

Search Property

Property Listing

Property Search

API

Domain

Data

API

Object Store

Document

Text

Portal

View

Controller

Model

Create Property

Search Property
<<API>>

Property
Created

Create Property

Property
Created

Property Listing

Property Search

CMD -> message
Events -> message

API

Domain

Data

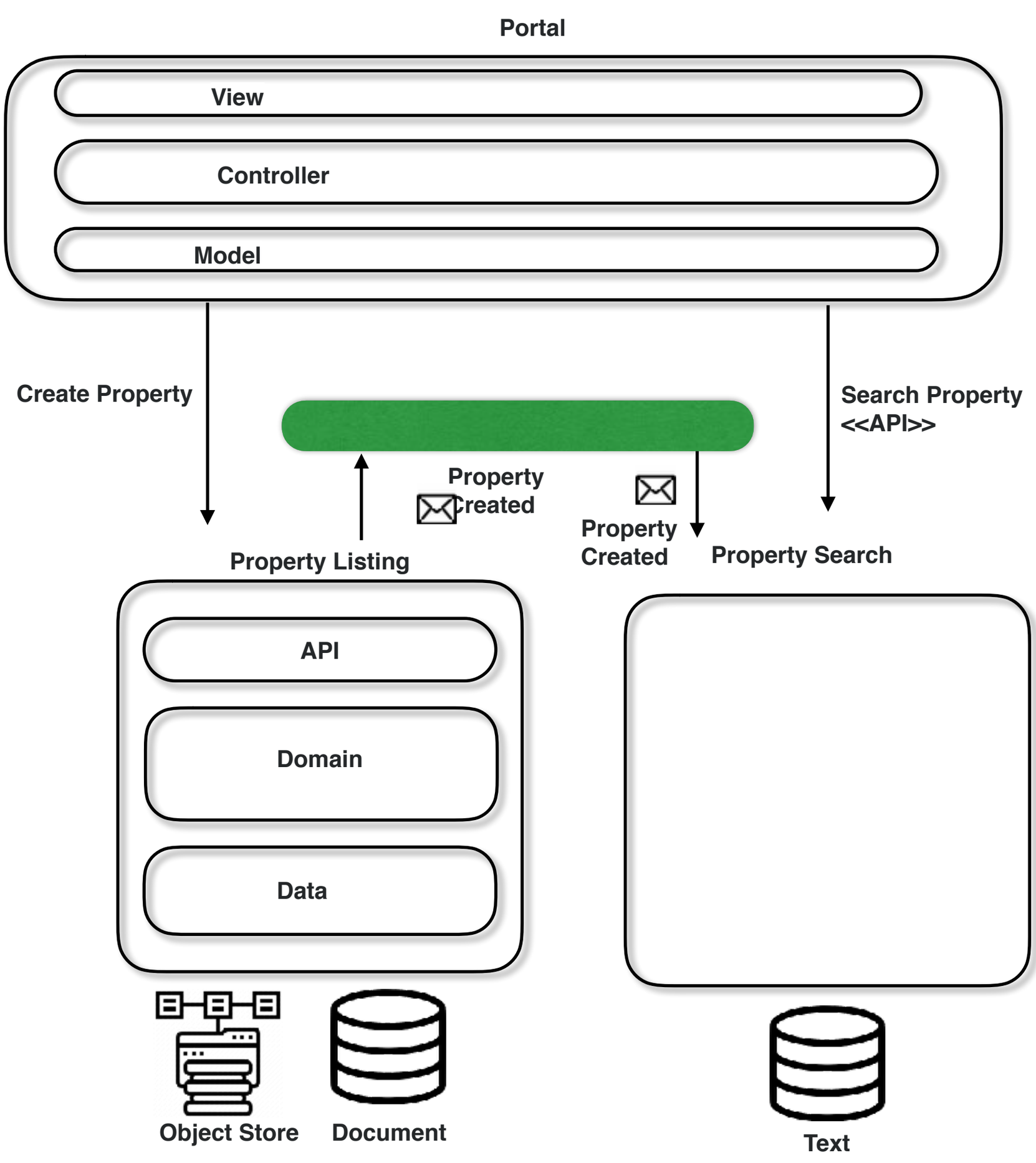
Object Store

Document

Text

Domain Events and Domain Commands

CMD -> API
Events -> message



Portal

View

Controller

Model

Property Listing

API

Domain

Data

Property Booking

Property Search

Object Store

Document

RDBMS

Current Booking

Wide Column

Booking History

Text

Property Listing

API

Domain

Data

Property Booking

Property Search

Object Store

Document

RDBMS

Wide Column

Text

Current Booking

Booking History

Property Created

Property Fraud

Fraud Detection Service

Property Listing

API

Domain

Data

Property Booking

Property Search

Object Store

Document

RDBMS

Wide Column

Text

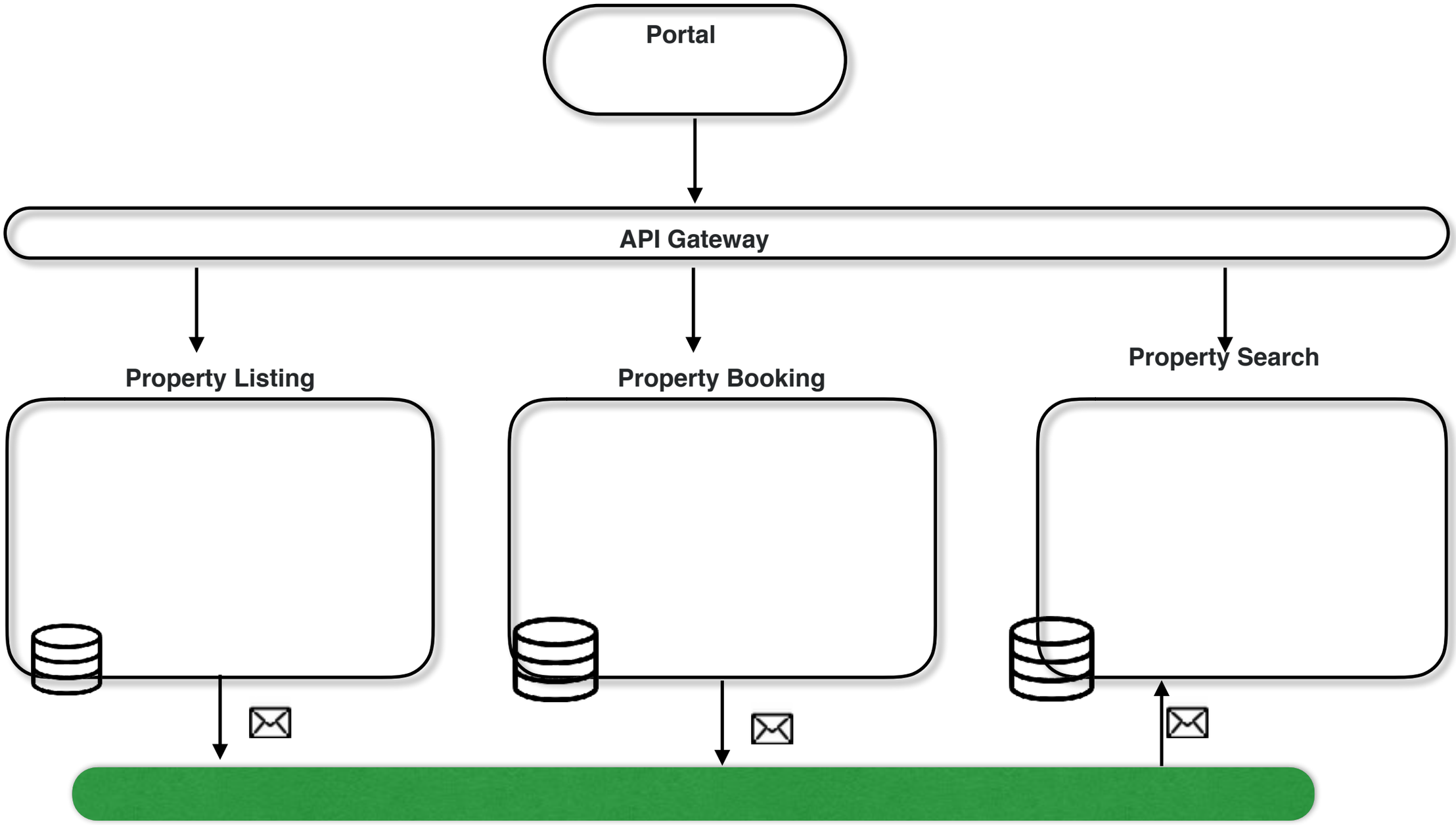
Current Booking

Booking History

Get Property Created

Mark Property Fraud

Fraud Detection Service



Event Sourcing (Domain Event)
Event Driven Architecture
API Gateway