Viral Images!

System of Integrations

university of groningen

for the course of Enterprise Application Integration

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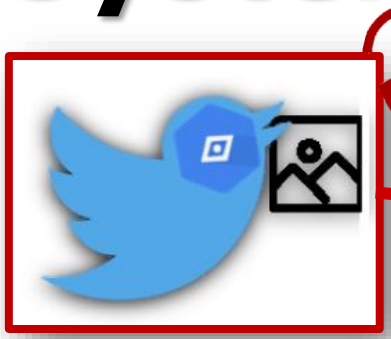
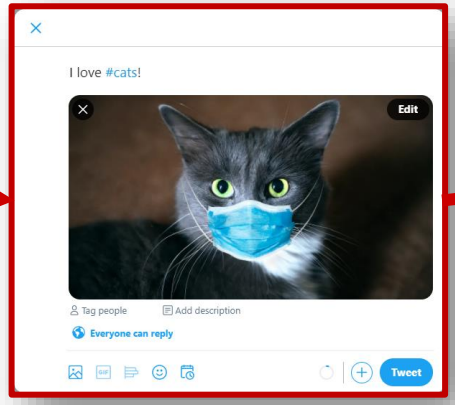
System Context



1. Monitor **#cats**

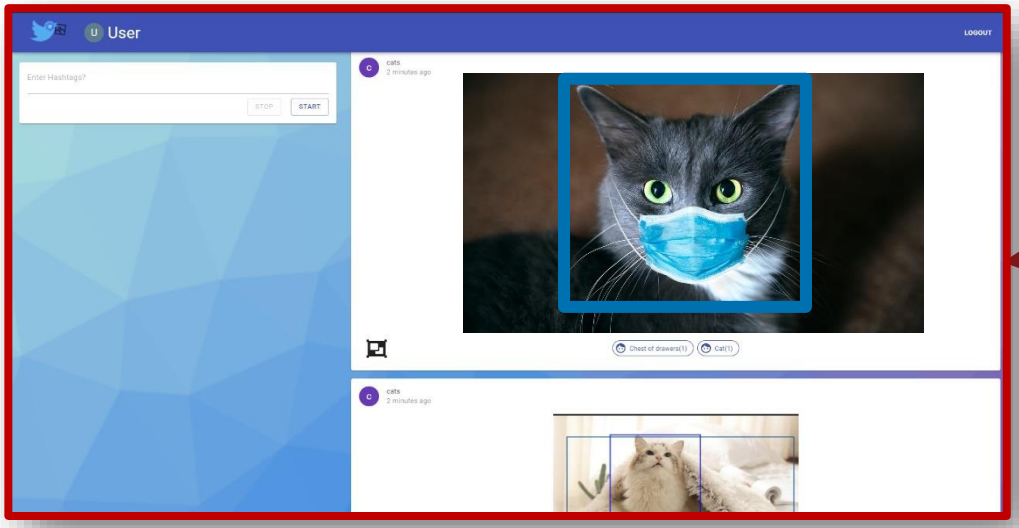


2. Internet **posts** image

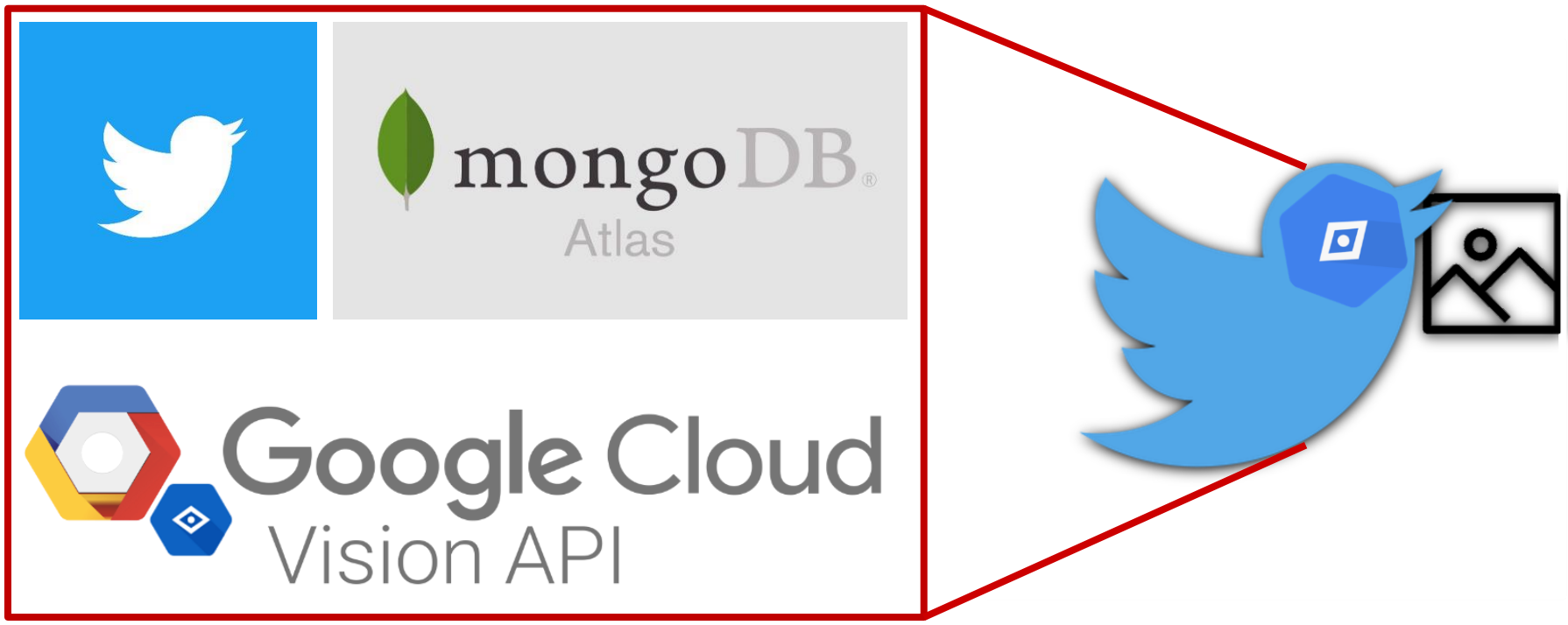
3. Annotating

4. Logging

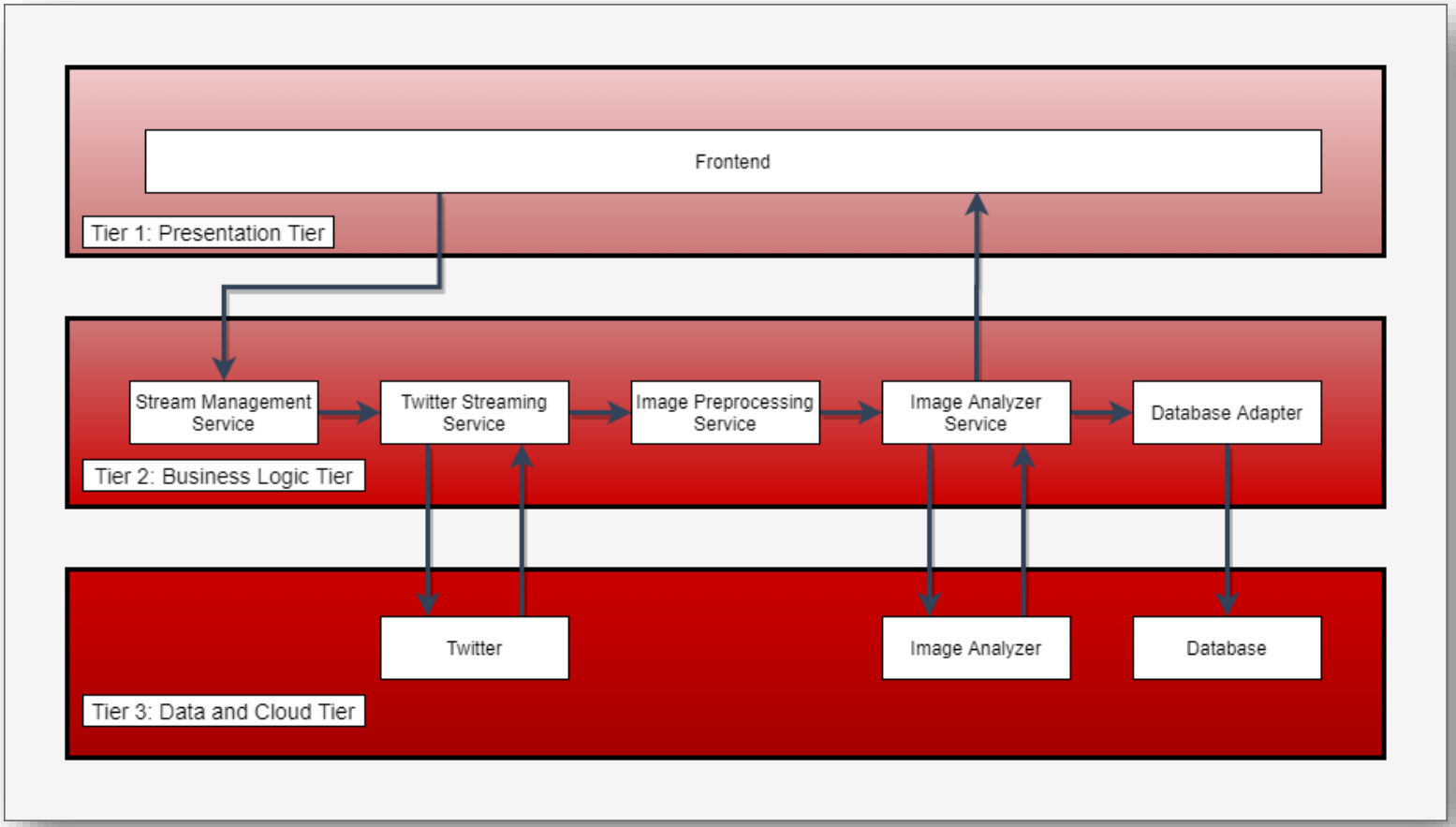
5. Frontend**!**



Integrated Systems



Tiered Architecture



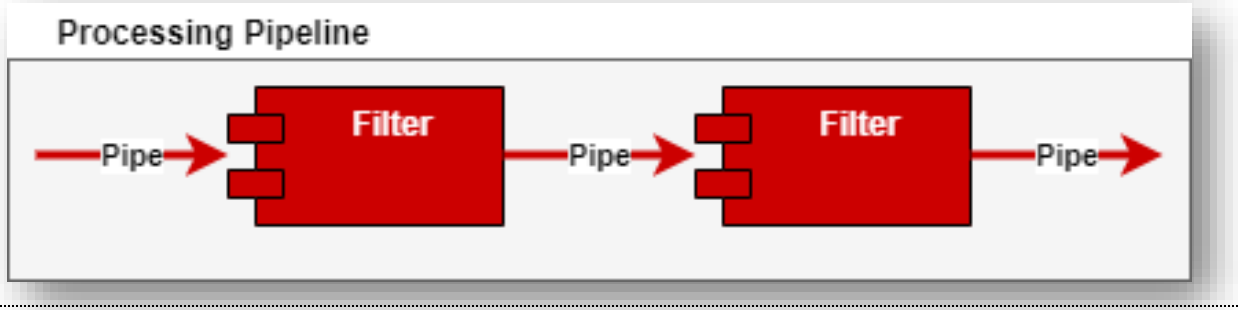
Problem #1

How to get from **Twitter** -> **Output** ?

Assumptions/Constraints

- Multiple processing **stages** required
- Transferred data (images) may be **large**
- Analysis may take a **long time**

Integration Style in-between processing pipeline components (Pipes and Filters)



Chosen

- Pipes and Filters
- Messaging
- Point-to-Point Channel
- Document Messages

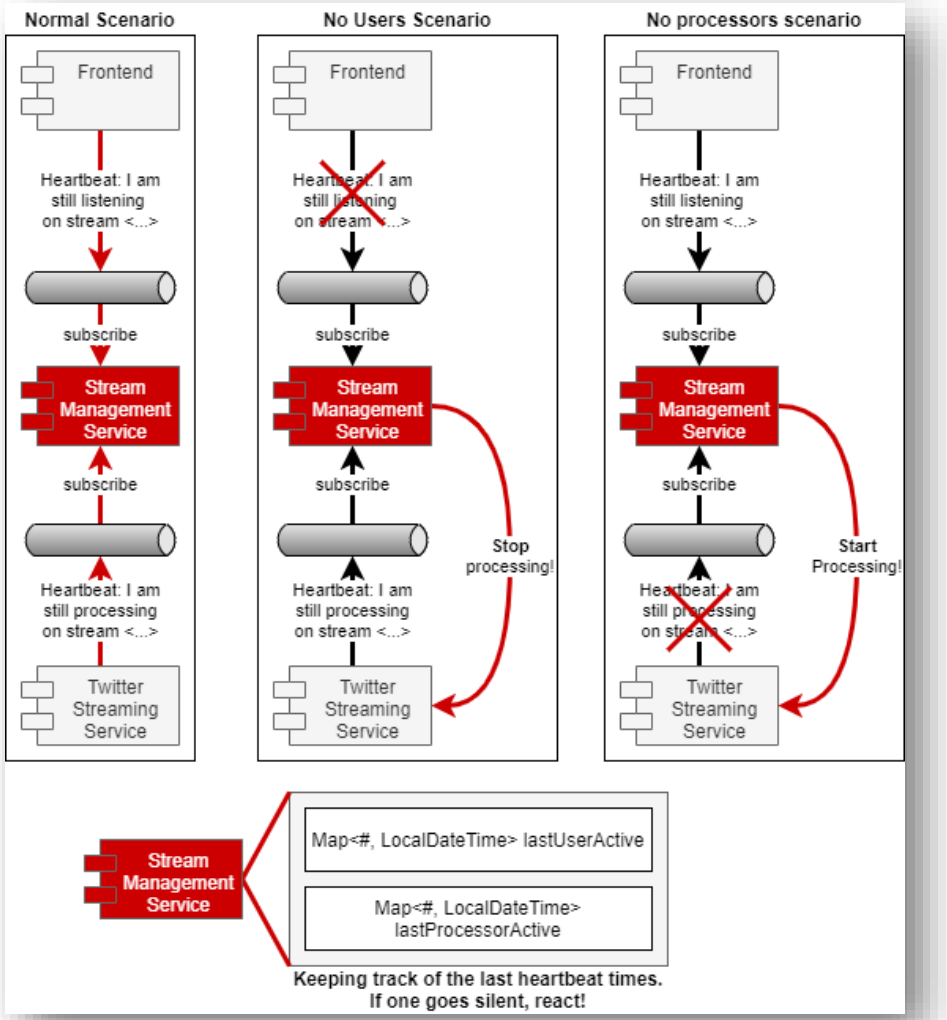
Problem #2

When to **start** and **stop** data ingestion from **Twitter**?

Assumptions/Constraints

- N users watch #hashtag -> **1 data ingestion** on #hashtag
- 0 users watch #hashtag -> **0 data ingestion** on #hashtag
- Users are **unreliable**. Will not always click "**stop**"
- What if… **Twitter** ingestion app crashes?

Pipeline Lifecycle Management



Chosen

- Observer
- Event Messages
- Splitter
- Command Message
- Correlation Identifier
- Idempotent Receiver
- Content-based Router

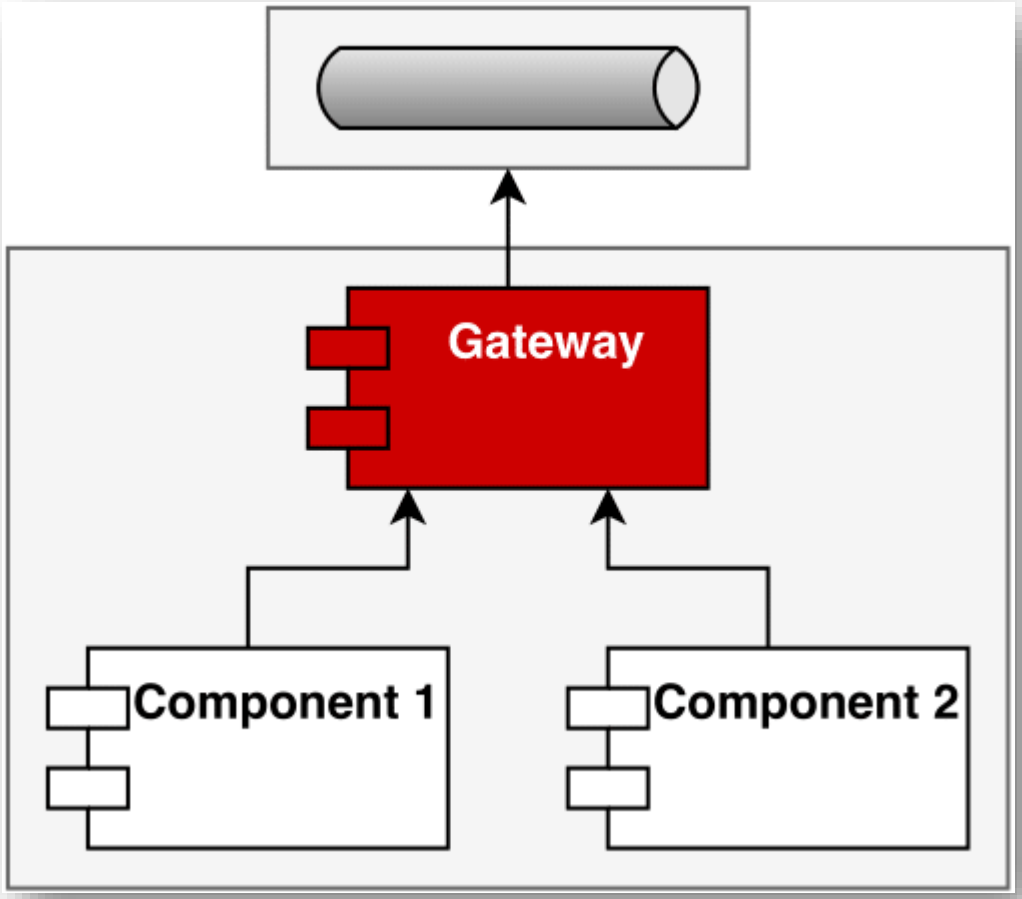
Problem #3

Decoupling between **Messaging** <-> **Business Logic**

Assumptions/Constraints

- Business logic should be 100% agnostic to communication
- Messaging System may be replaced

Coupling between code and messaging system (Gateway)



Chosen

- Gateway

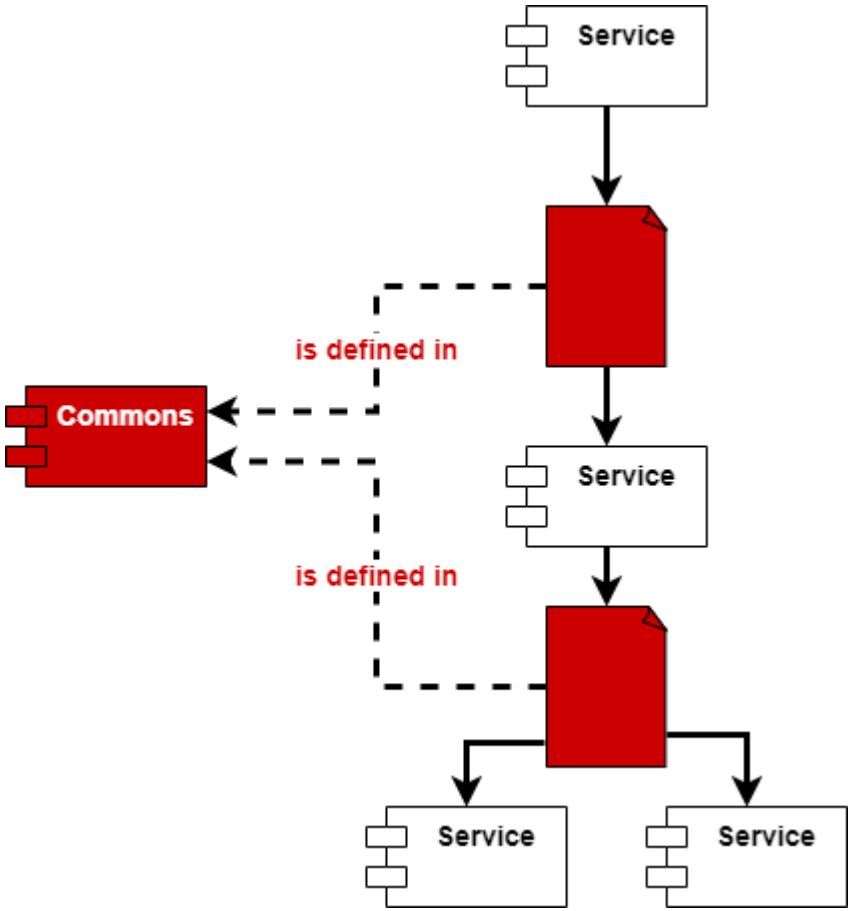
Problem #4

Agreement on **Data Format**

Assumptions/Constraints

- Components communicate data
- Different data formats used throughout application
- Applications may need to modify data formats
- Applications should allow independent compilation

Cross-application data model sharing (Canonical Data Model)



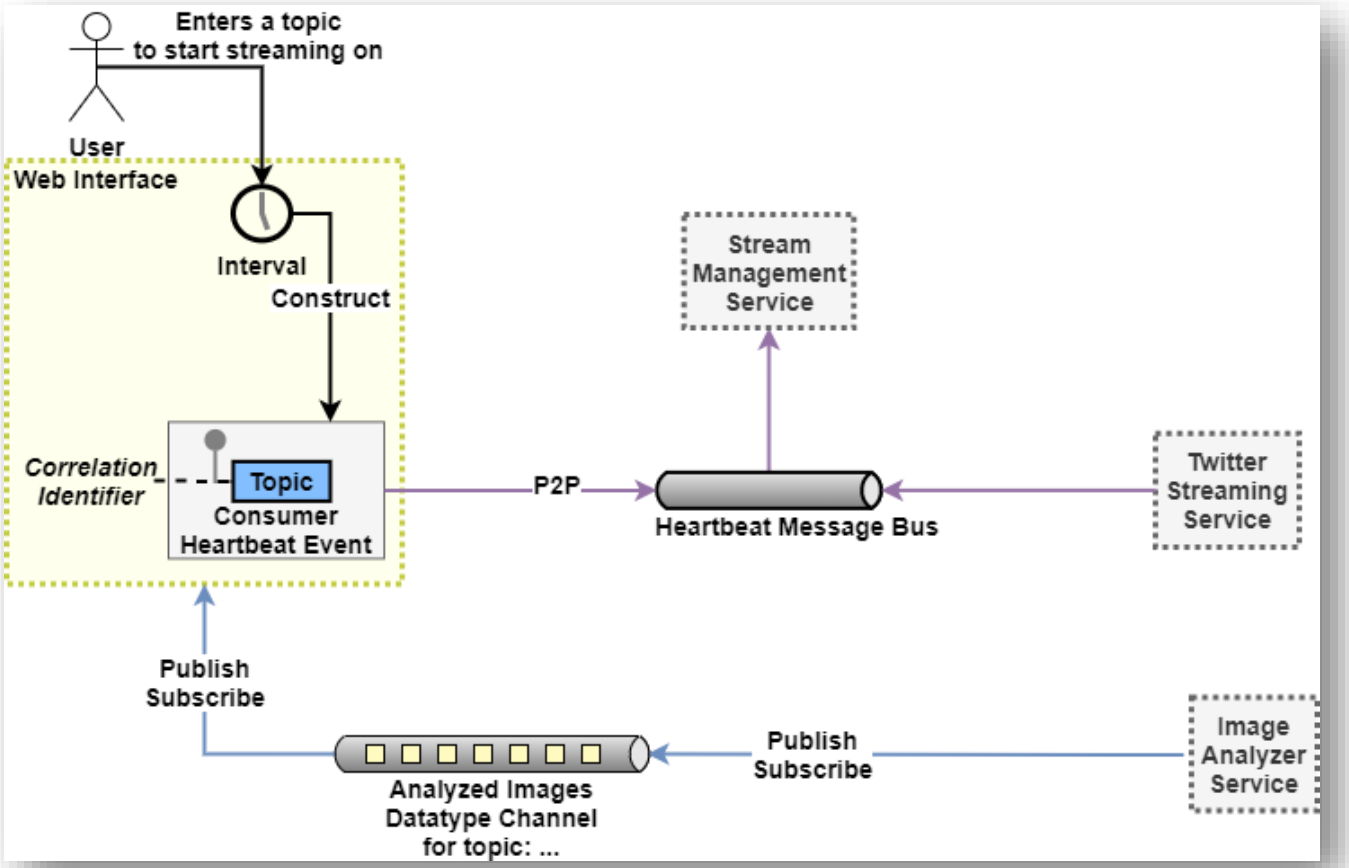
Chosen

- Canonical Data Format

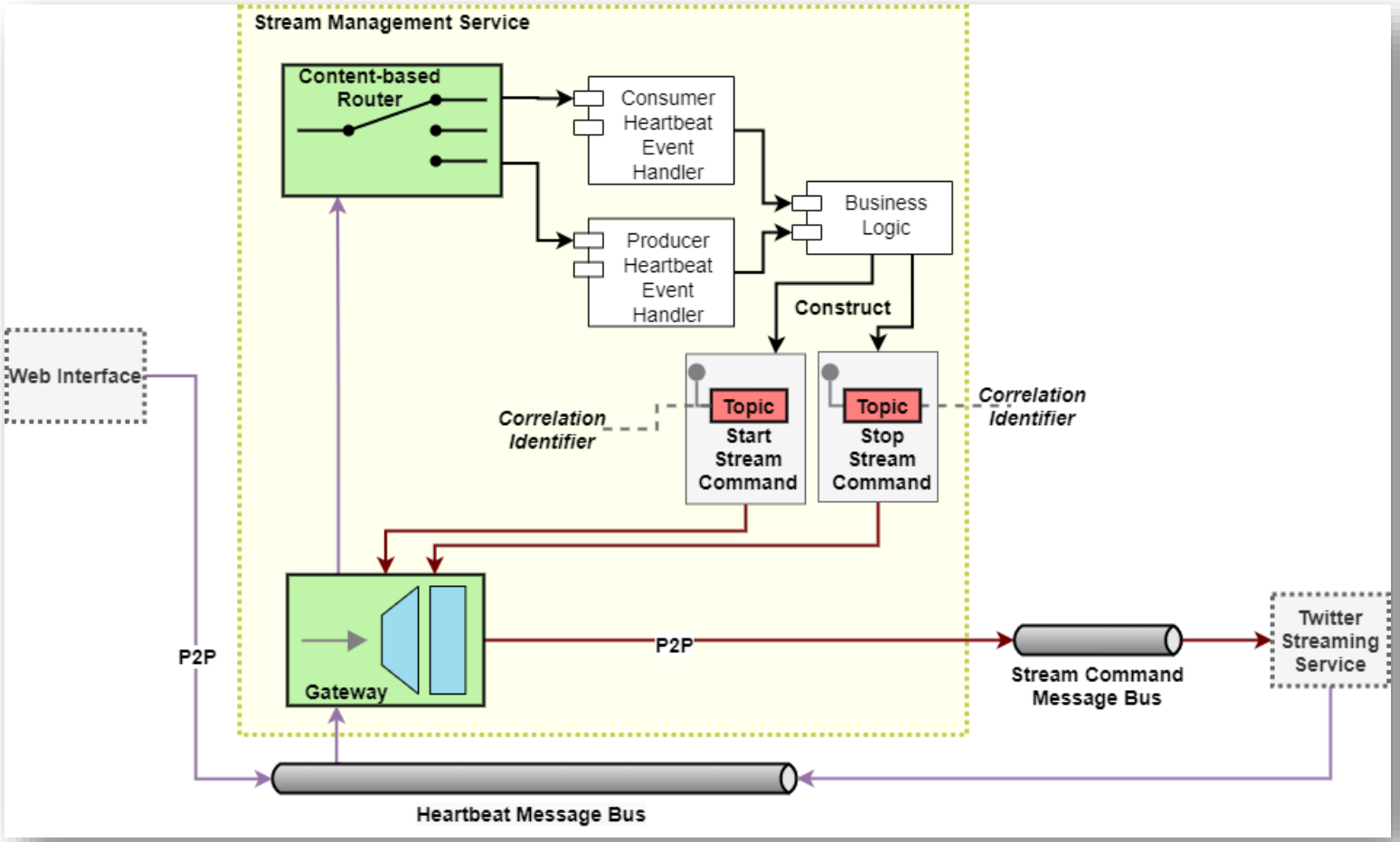
Design Decisions

- **Integration Style in-between processing pipeline components (Pipes and Filters)**
- **Pipeline Lifecycle Management**
- **Coupling between code and messaging system (Gateway)**
- **Cross-application data model sharing (Canonical Data Model)**
- Delivering Analysis Results to the Frontend (Publish-Subscribe)
- Filtering results and removing noise (Content Filter)
- Object Detection in images (Content Enricher)

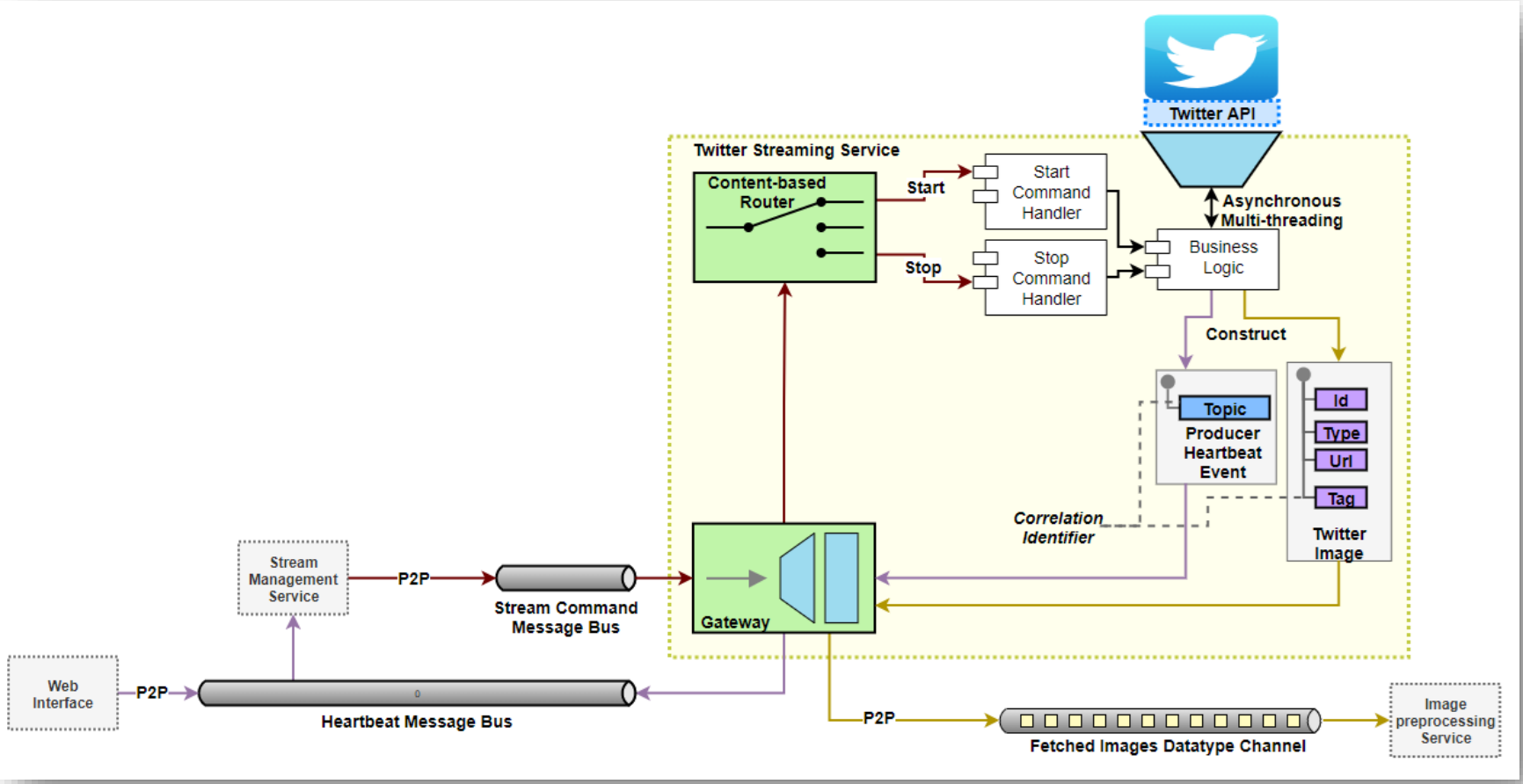
Architectural Diagram (Web Interface)



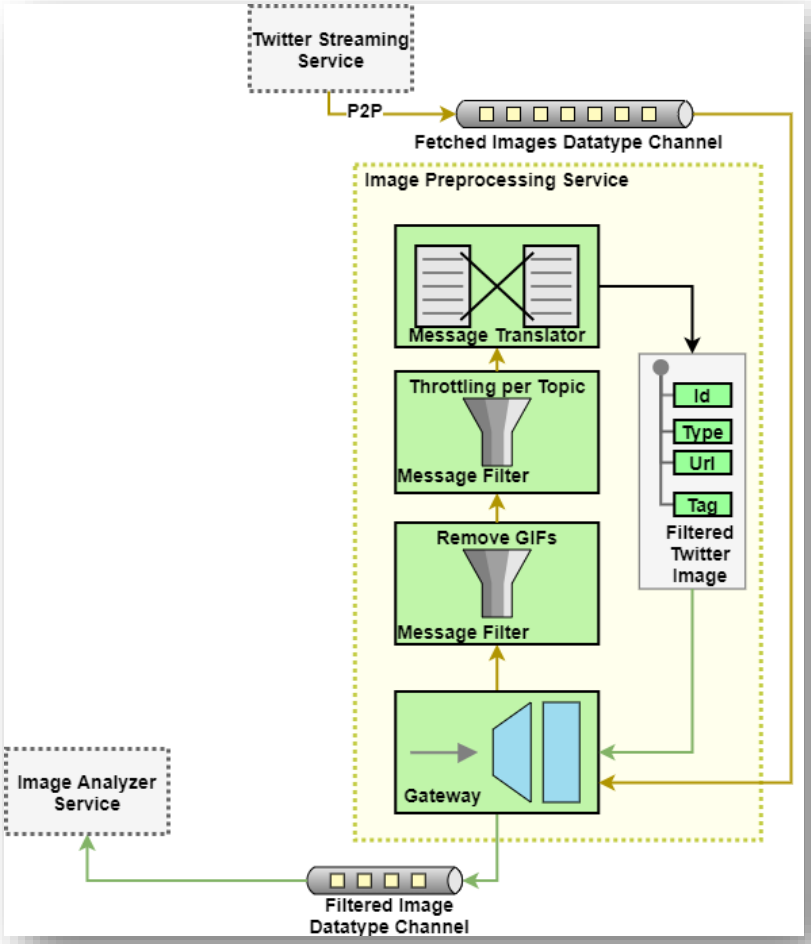
Architectural Diagram (Stream Management Service)



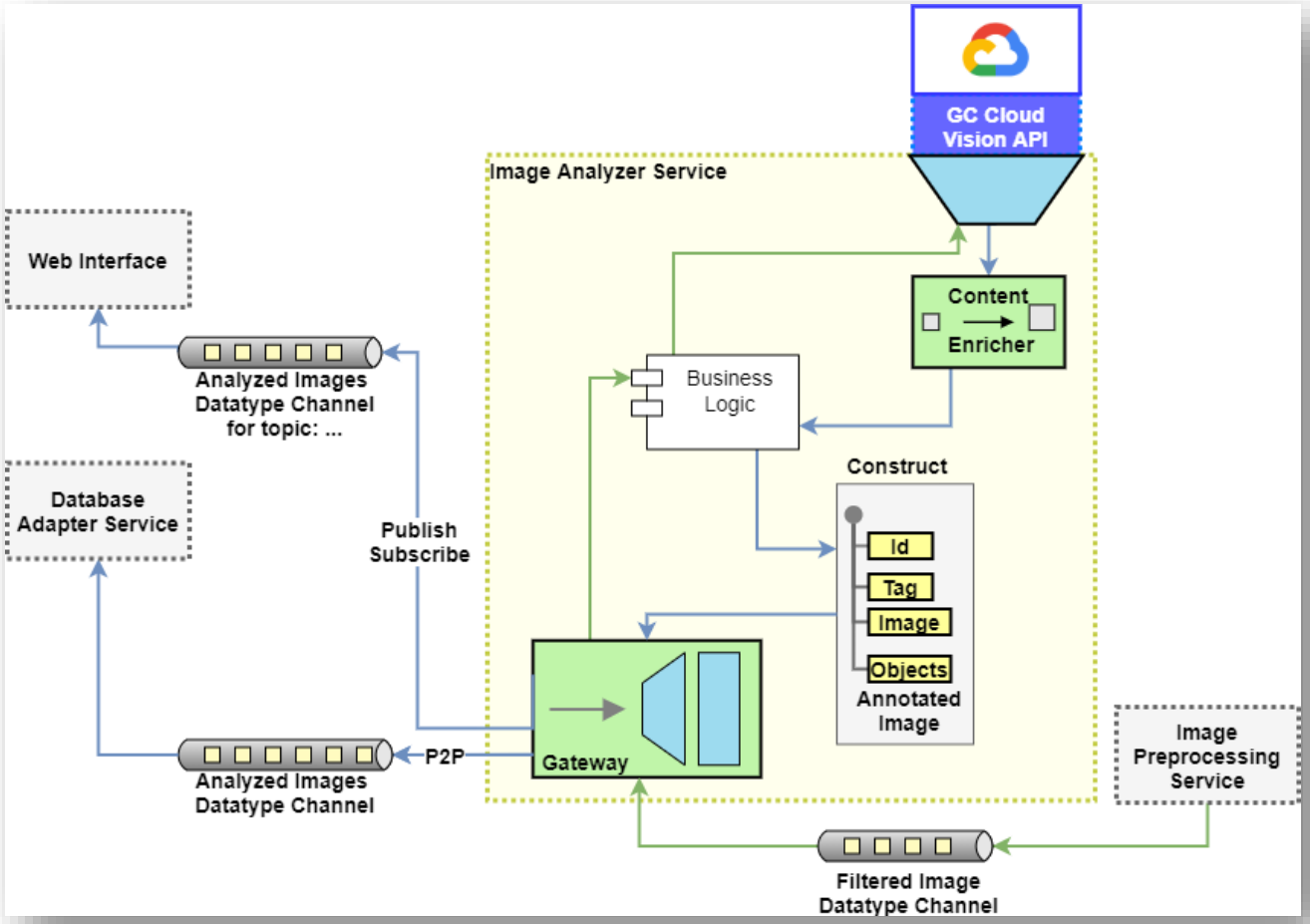
Architectural Diagram (Twitter Streaming Service)



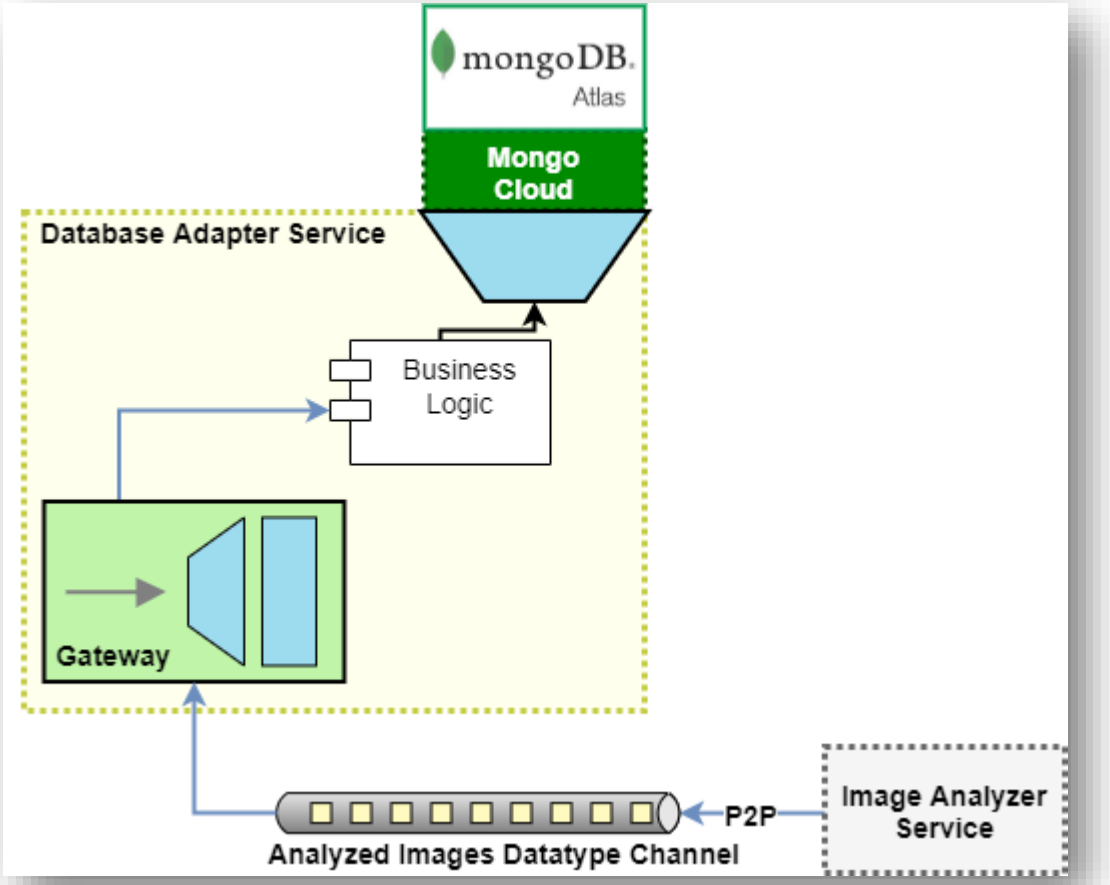
Architectural Diagram (Image Preprocessing Service)



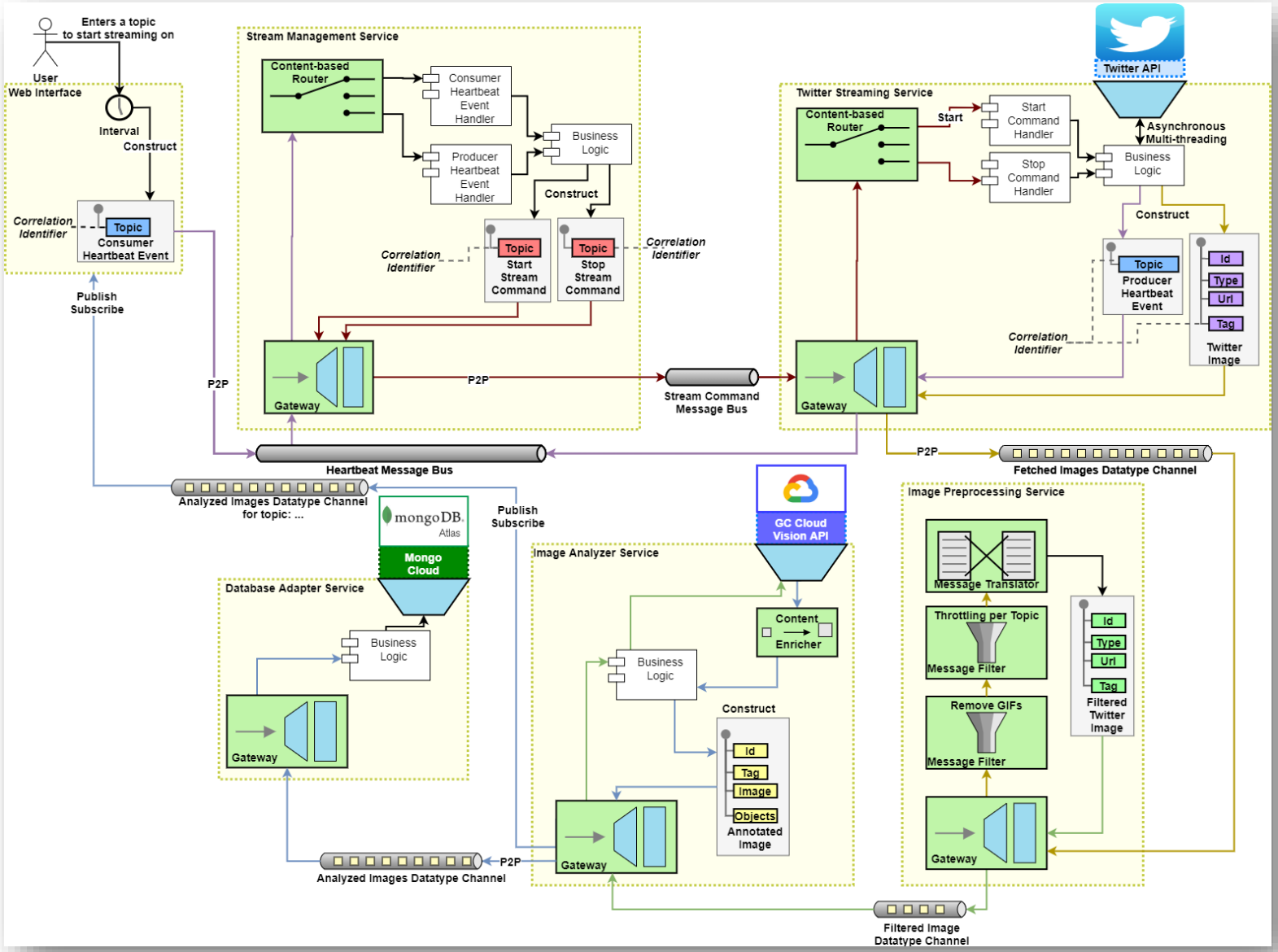
Architectural Diagram (Image Analyzer Service)



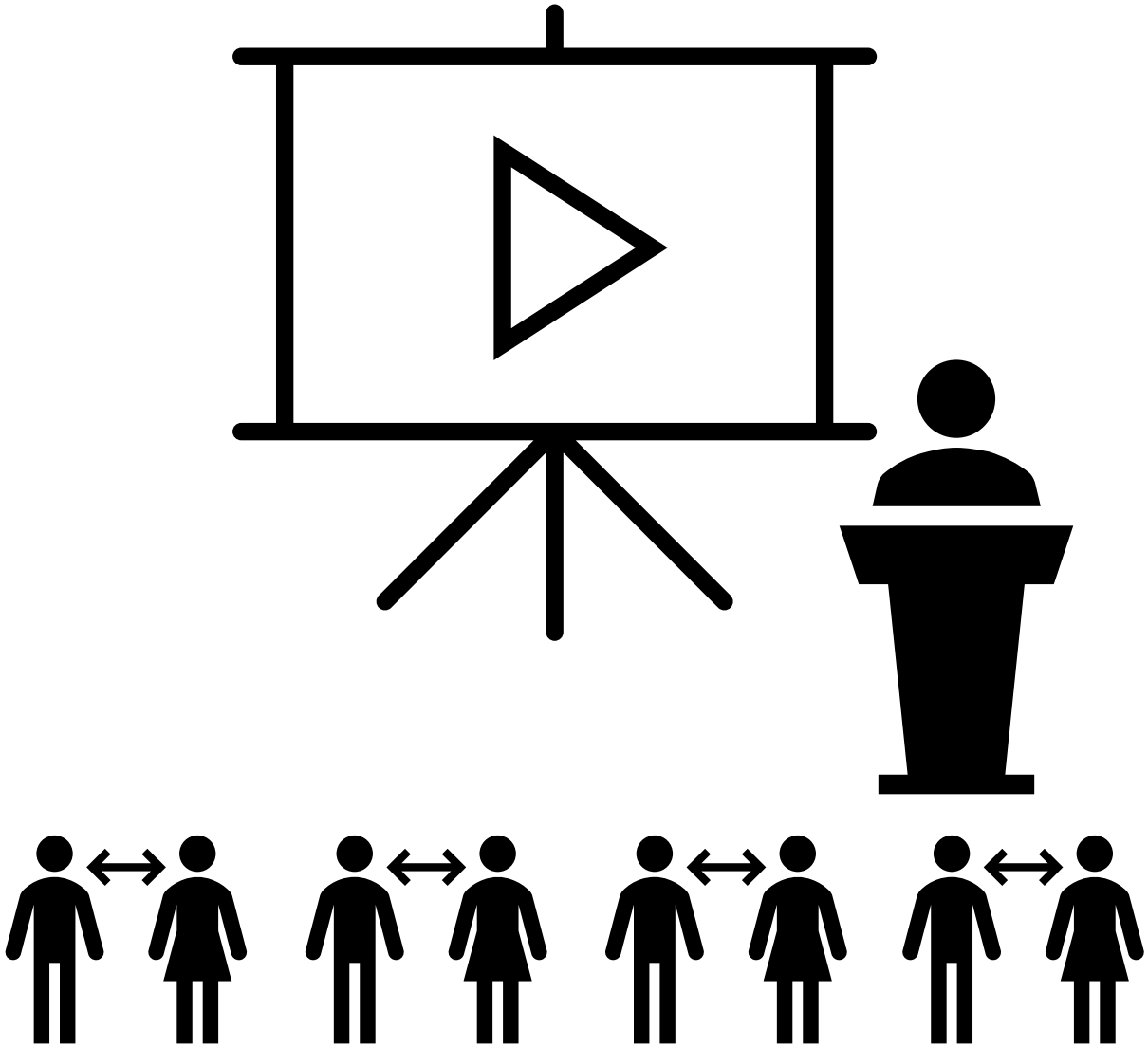
Architectural Diagram (Database Adapter Service)



Architectural Diagram



Demo



Technologies

Stomp

Spring Boot

ACTIVEMQ

docker