

# A Microservice architecture for monitoring, processing and predicting climate data in animal husbandry

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3. The machine learning pipeline
4. Technologies used
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## Context of the application

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## Context and problem

- Issues in animal livestock farms regarding diseases induced by poor air conditions
- Farmers are forced to increase medication
  - > Additional costs, diminishes meat quality

## Poor air conditions

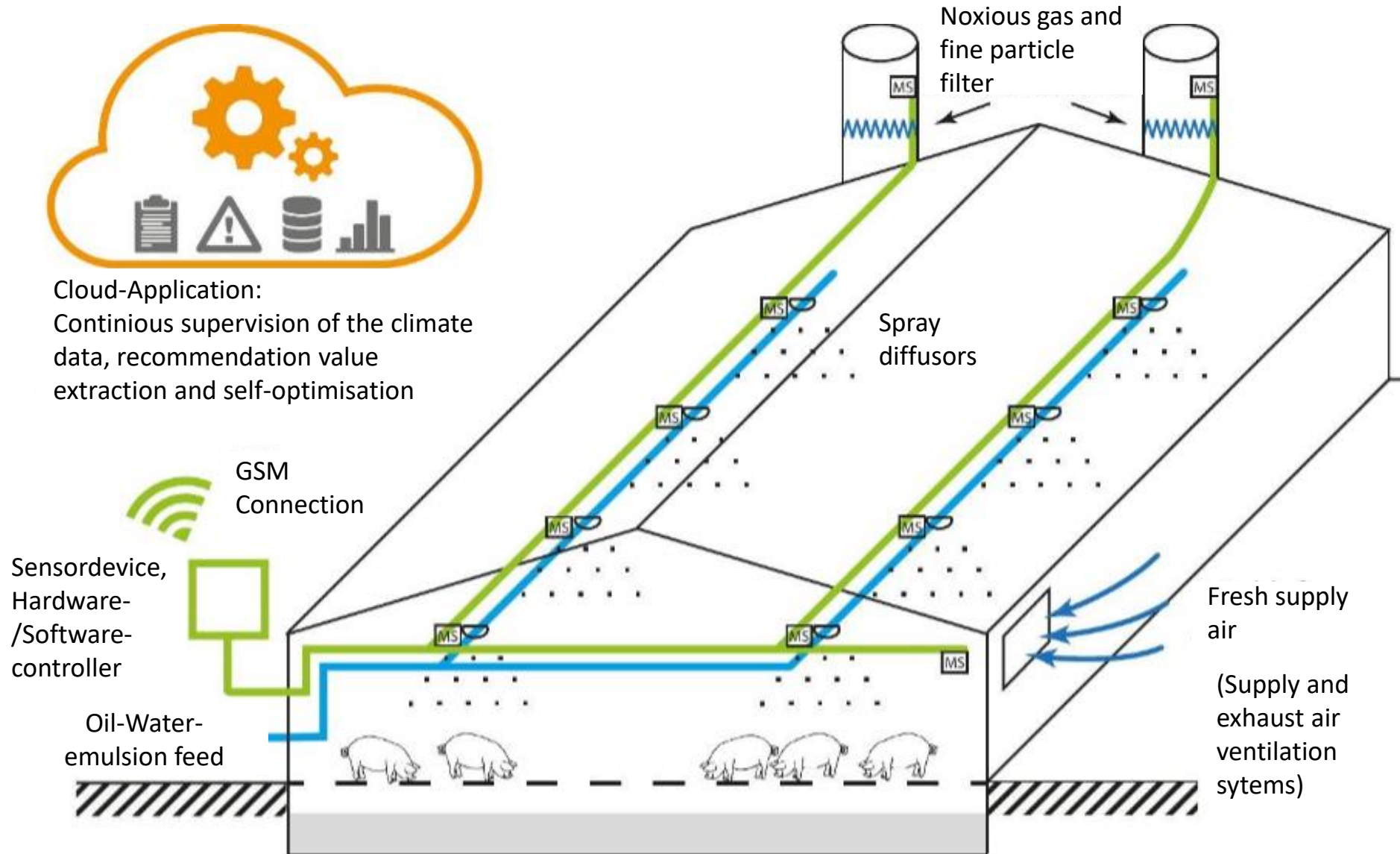
- Pigs: Ammonia (NH<sub>3</sub>), Carbon dioxide (CO<sub>2</sub>), increase temperature
- Installed climate Computers often only react when the problems already occurred
  - direct feedback control (reactive)

## Goal

- Support climate computers / farmers with additional long term data analysis of the air condition
- Overall improvement of the air condition for the animals -> System can work in a preventive manner



# Context of the application

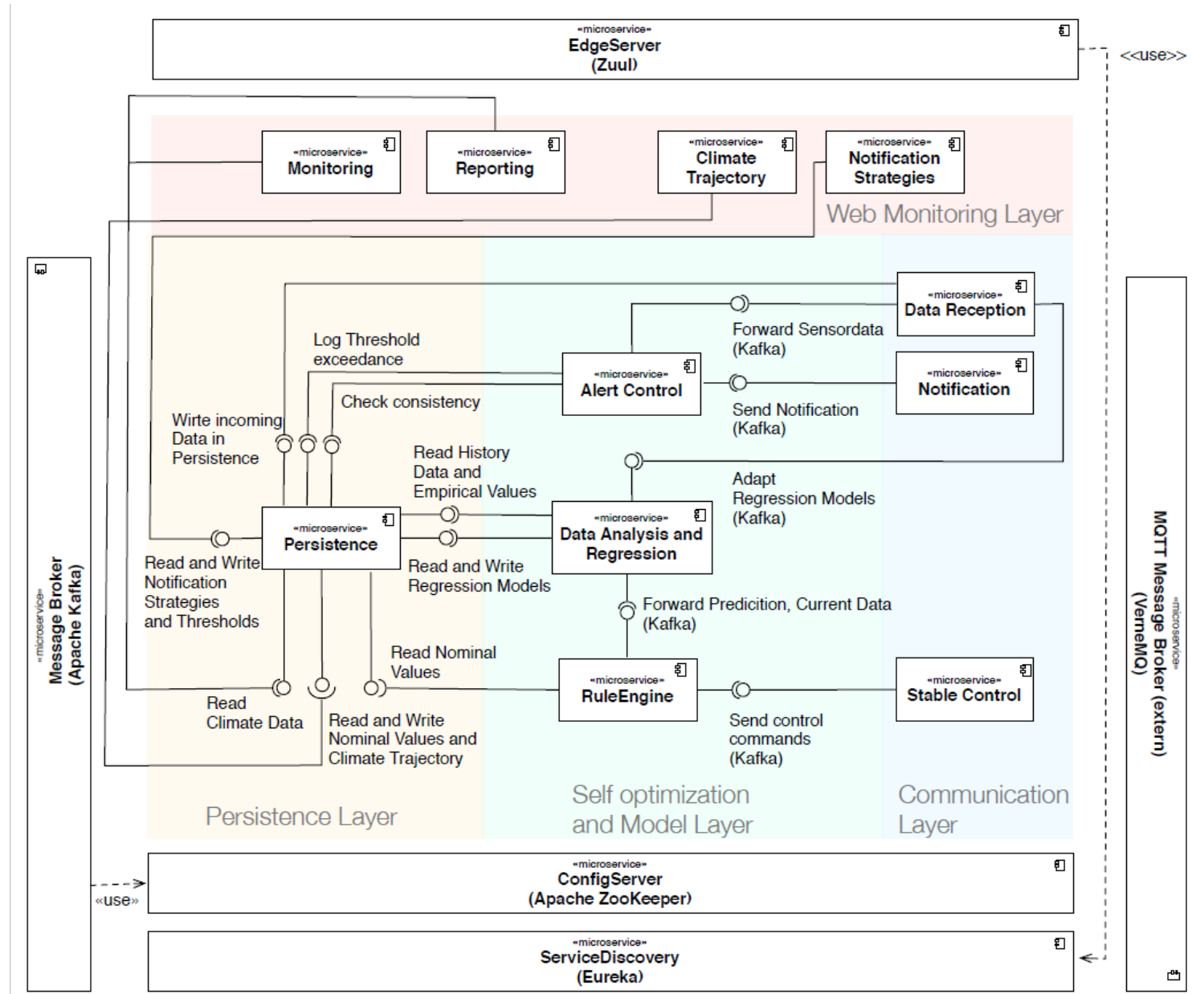


# Introduction of the microservice architecture

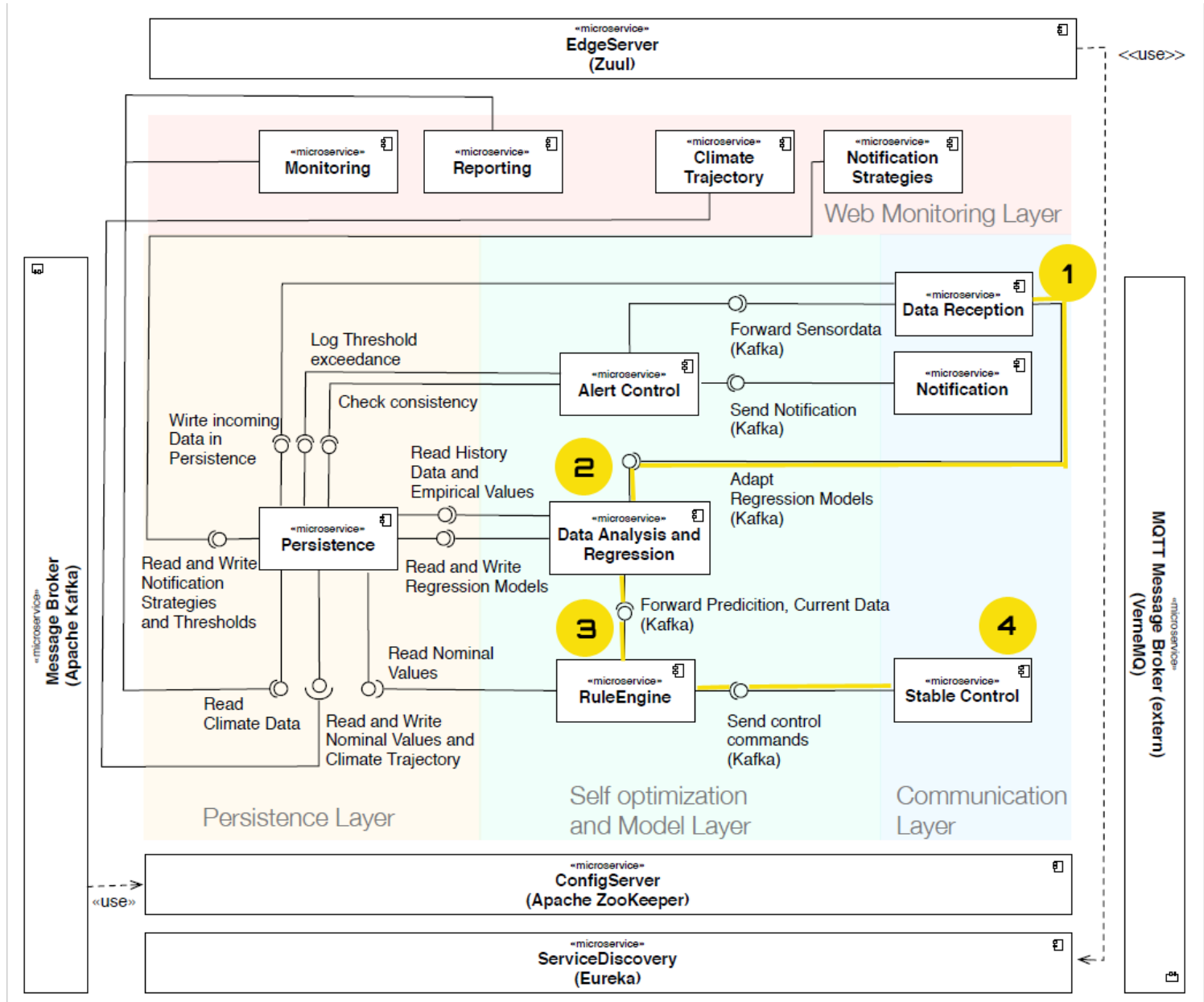
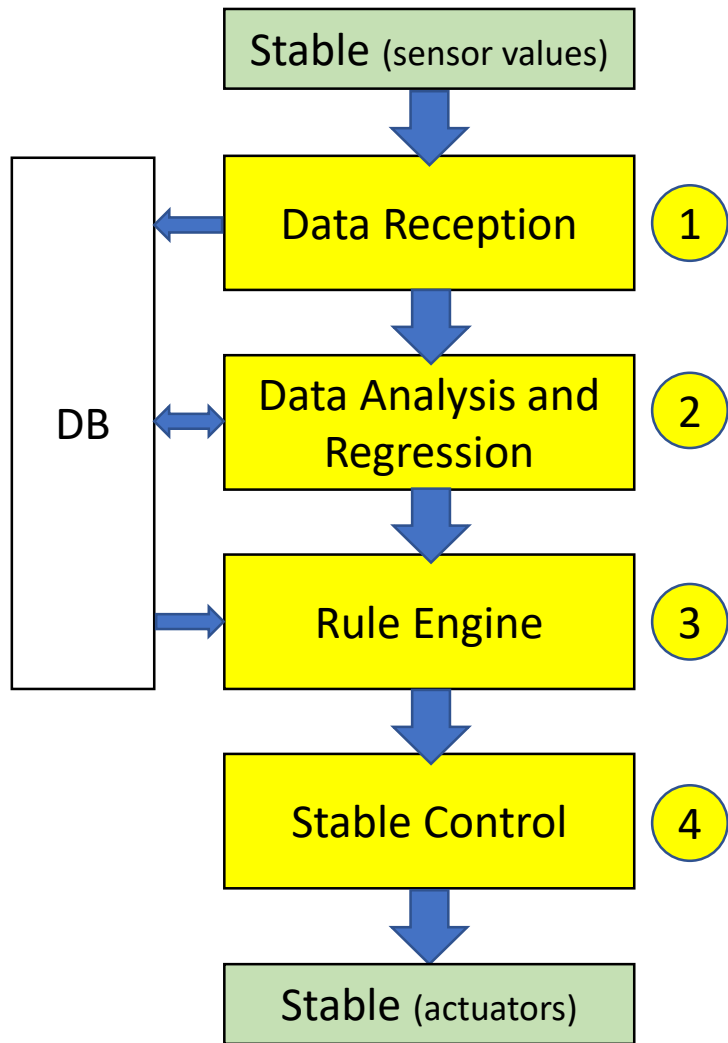
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# Introduction of the Microservice architecture

- Architecture consists of different application layers depicted as colored boxed
- Infrastructural services surround the application
- Message brokers used as backbone communication between services and for external communication (QoS)

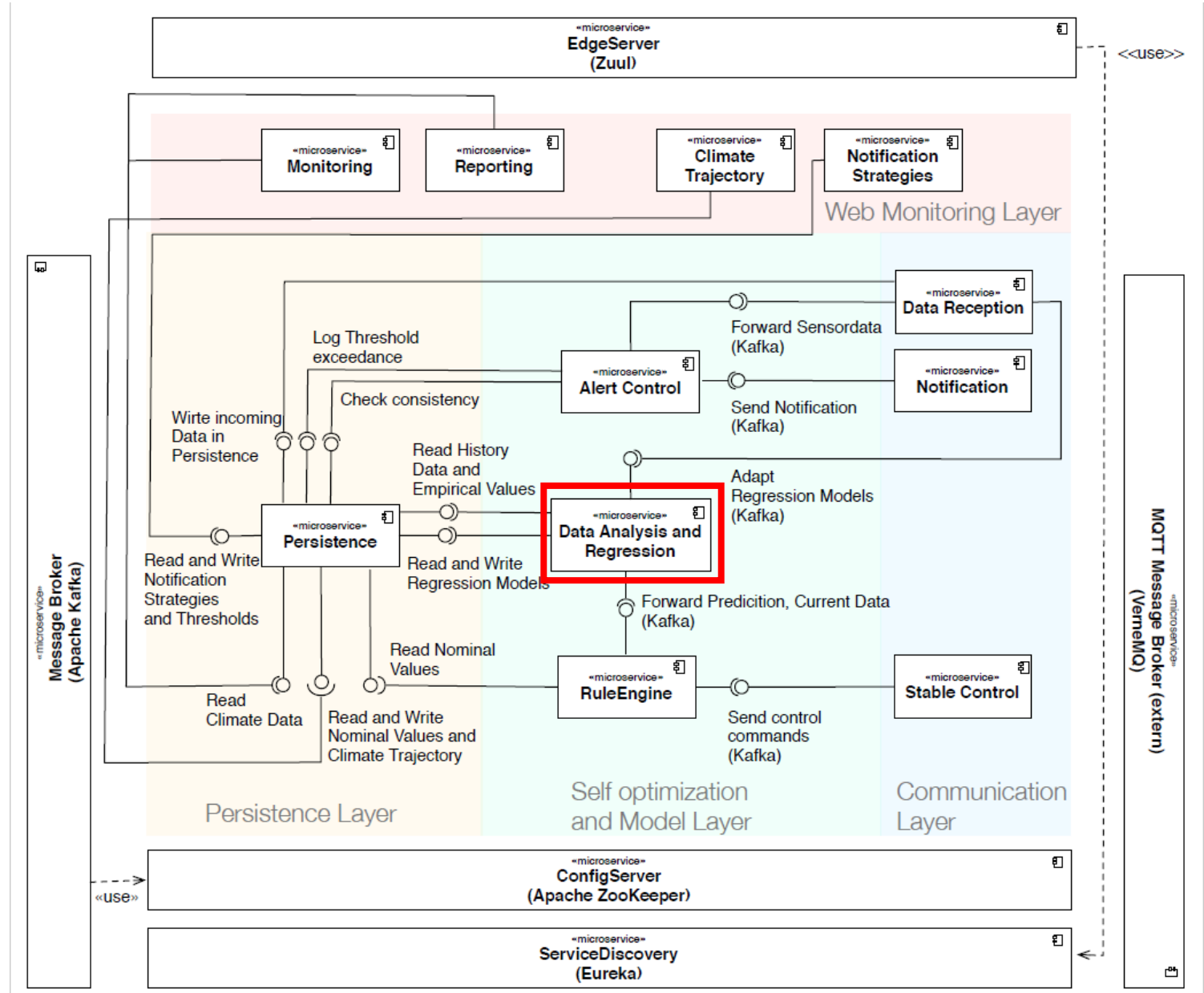


# Introduction of the Microservice architecture: The dataflow



# Introduction of the Microservice architecture: Machine learning service

- Core Service: Data Analysis and Regression (ML - Pipeline)

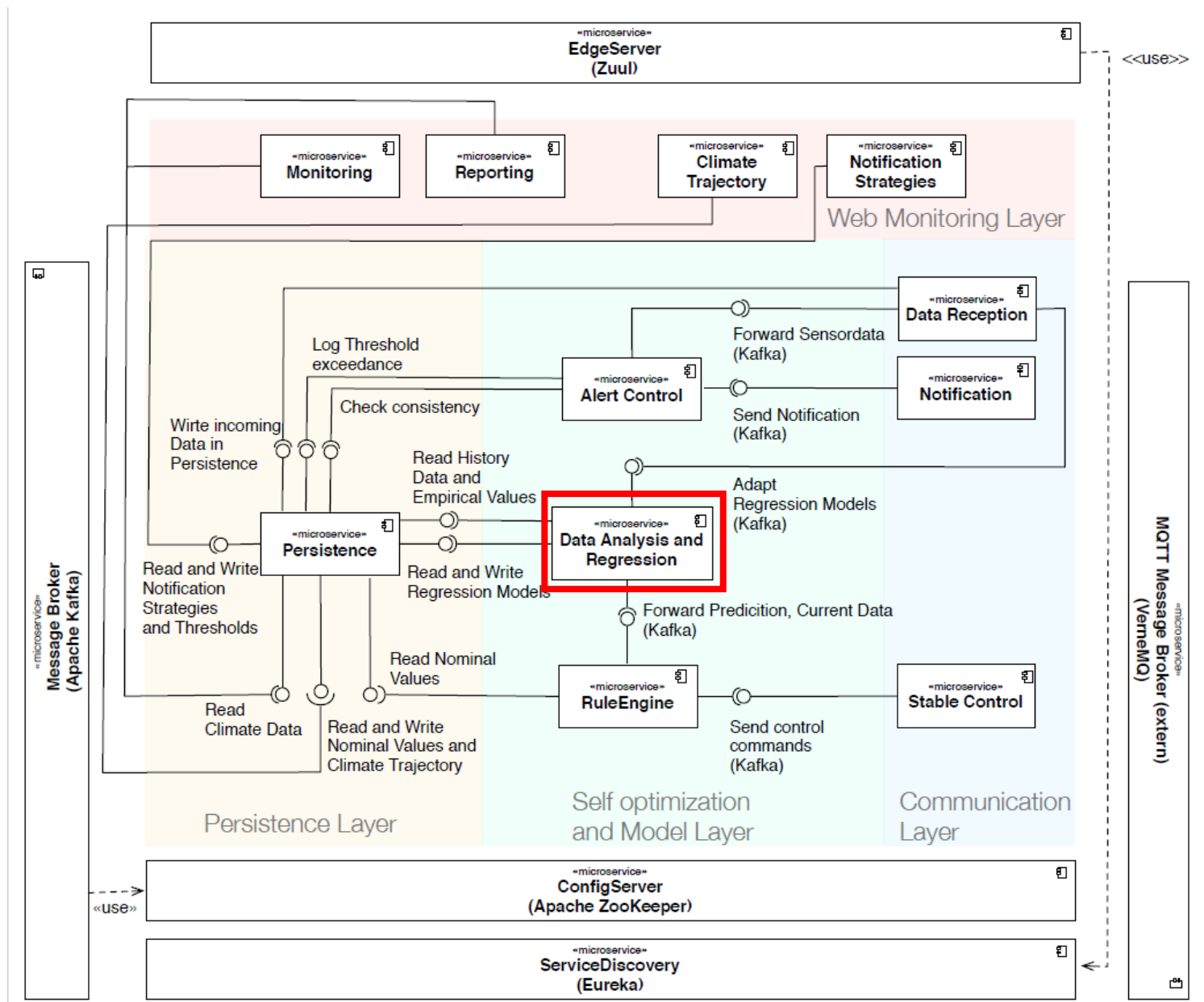


# Introduction of the Microservice architecture: Machine learning service

- Core Service: Data Analysis and Regression (ML - Pipeline)



Requires the most computing power

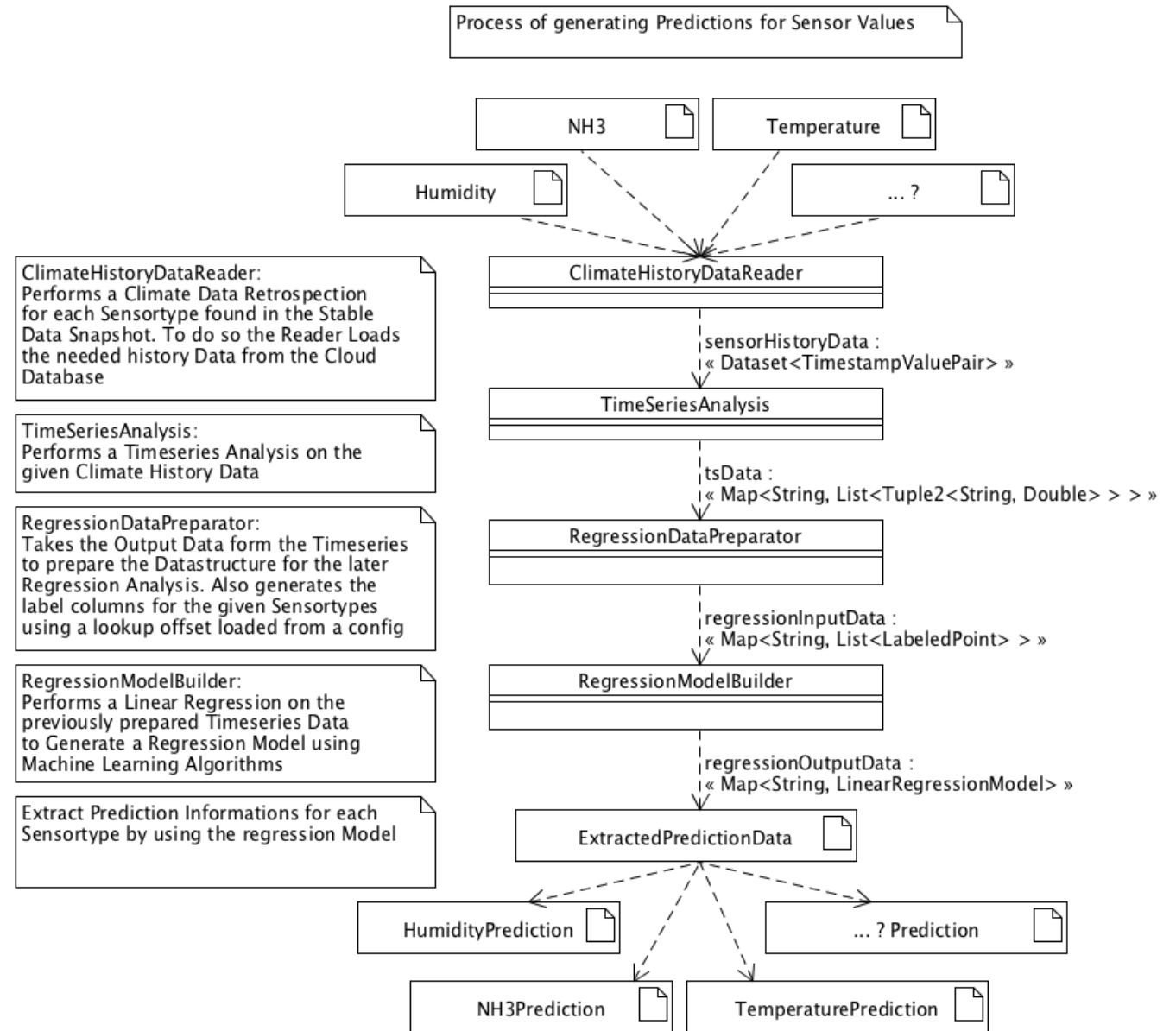


# The machine learning pipeline

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# The machine learning pipeline

- Machine learning pipeline consists of several processing steps which may take some time to compute
- Each stable has own regression models stored in the database (sequentially updated by the pipeline)
- Microservice architecture allows to create several instances of this service (load balancing)
- Clustered load distribution over several Hardware devices

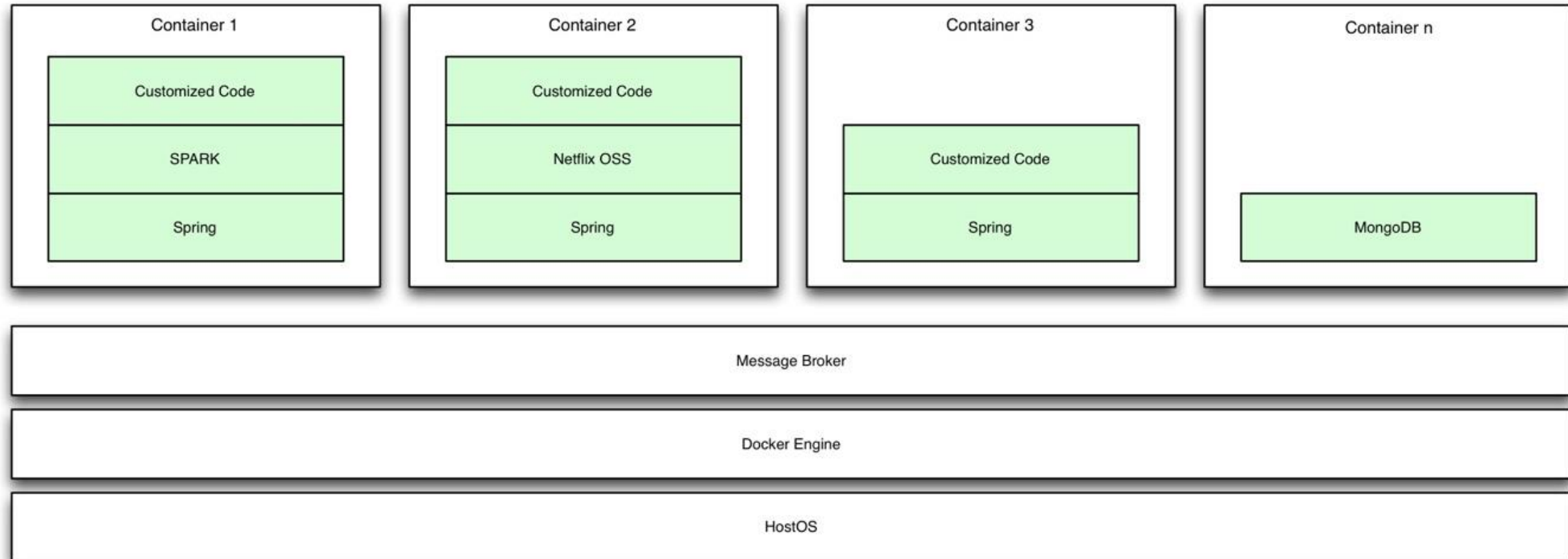




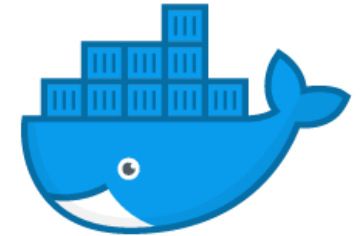
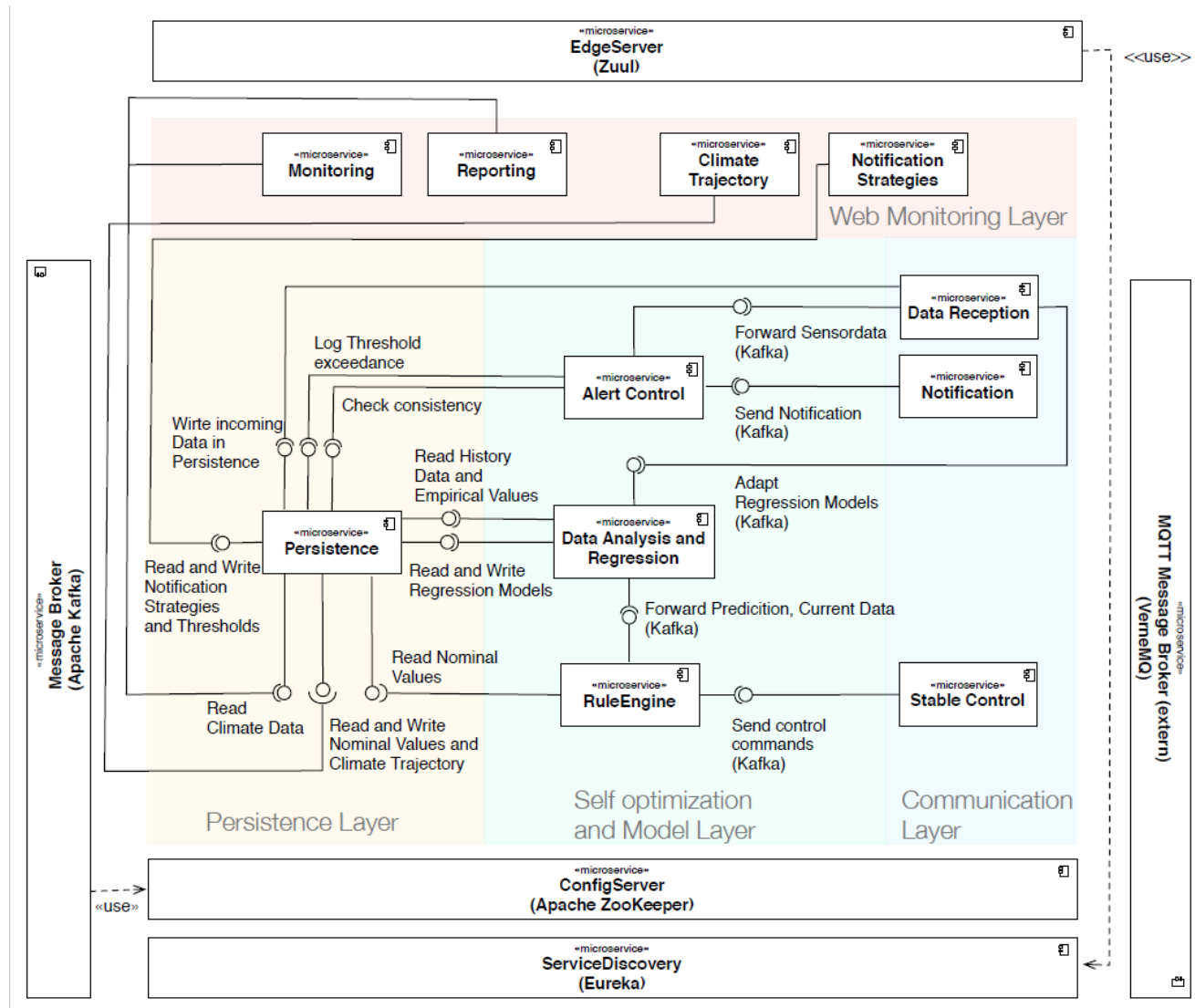
## Technologies used

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# Technologies used: Technology stack



# Technologies used



## Discussion

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