Model-Based Approach to Consume REST Services in Single Page Applications

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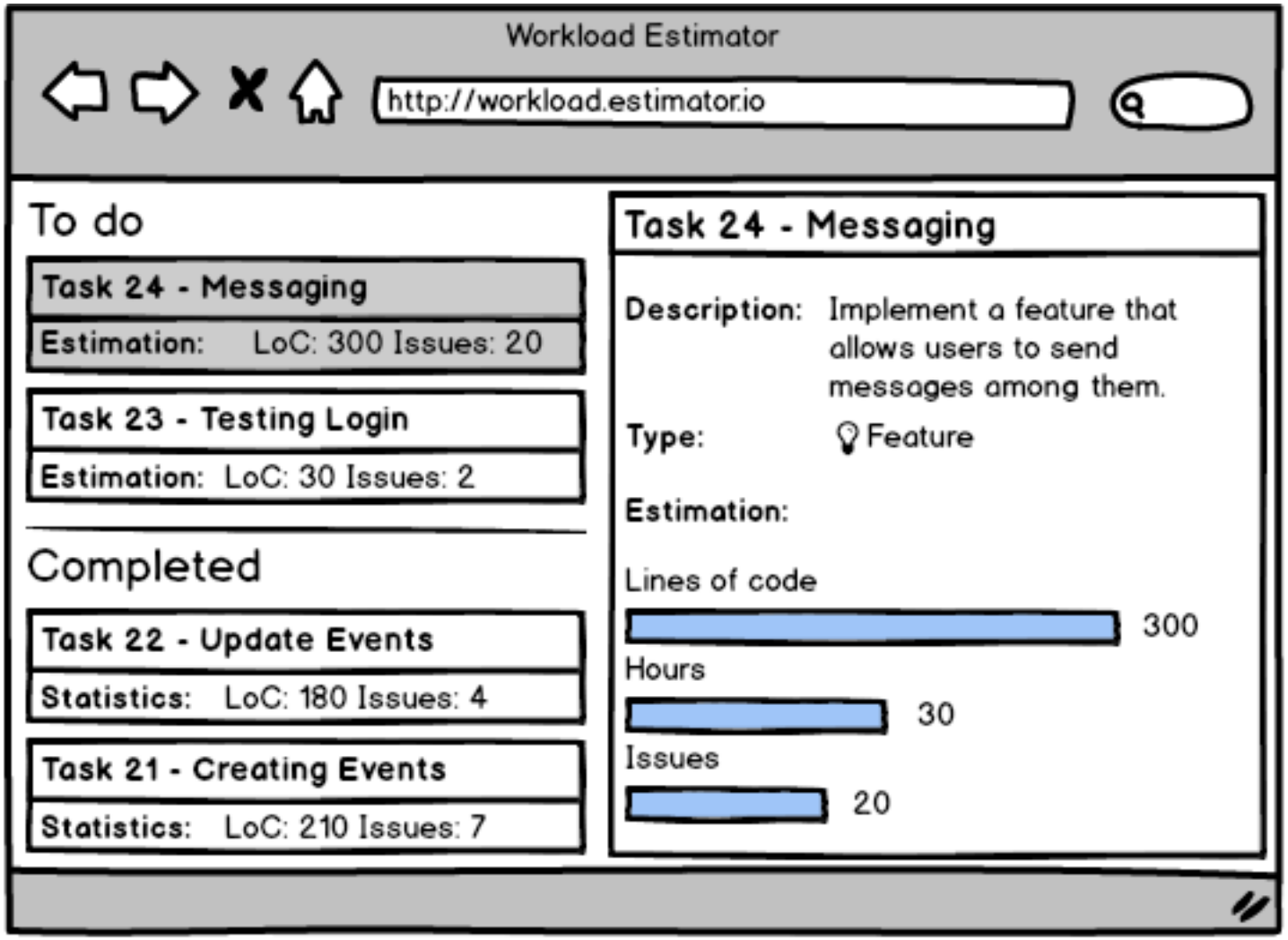
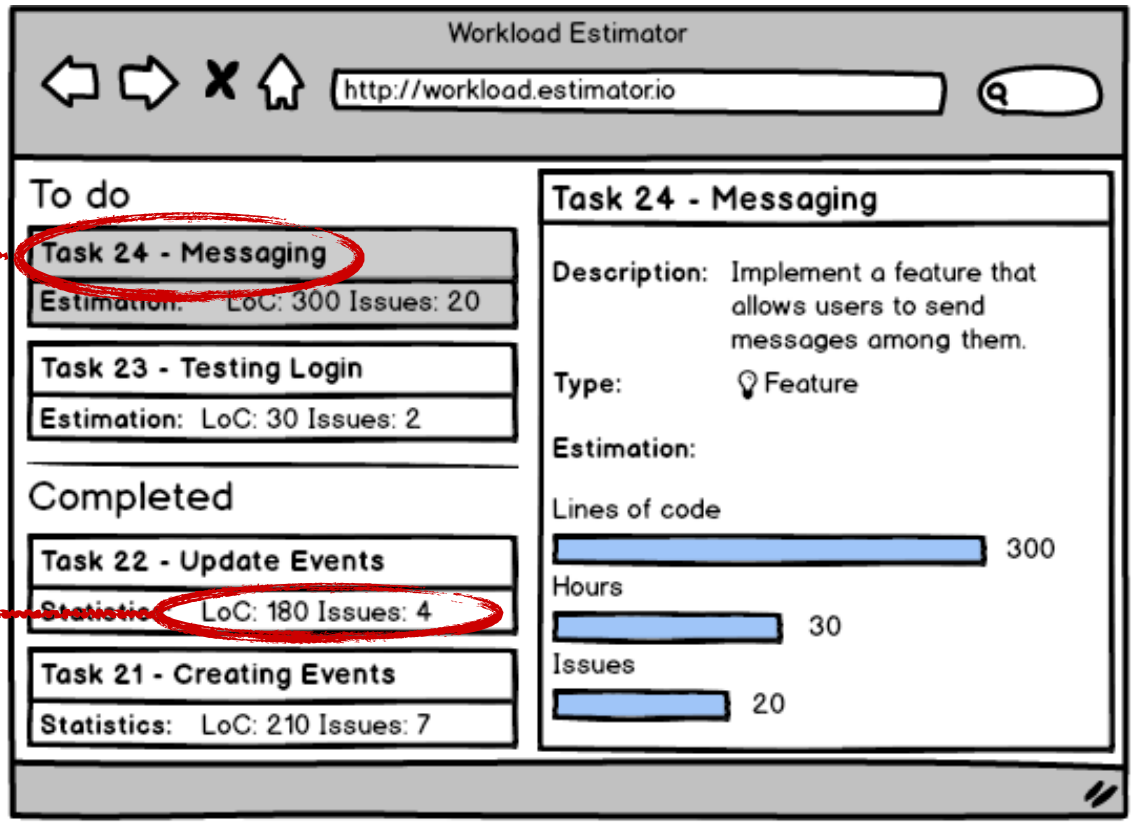
Agenda

1. Motivation and Problem
2. Research Questions
3. Existing Solutions
4. Limitations
5. Our solution
6. Expected artefacts & Timeline

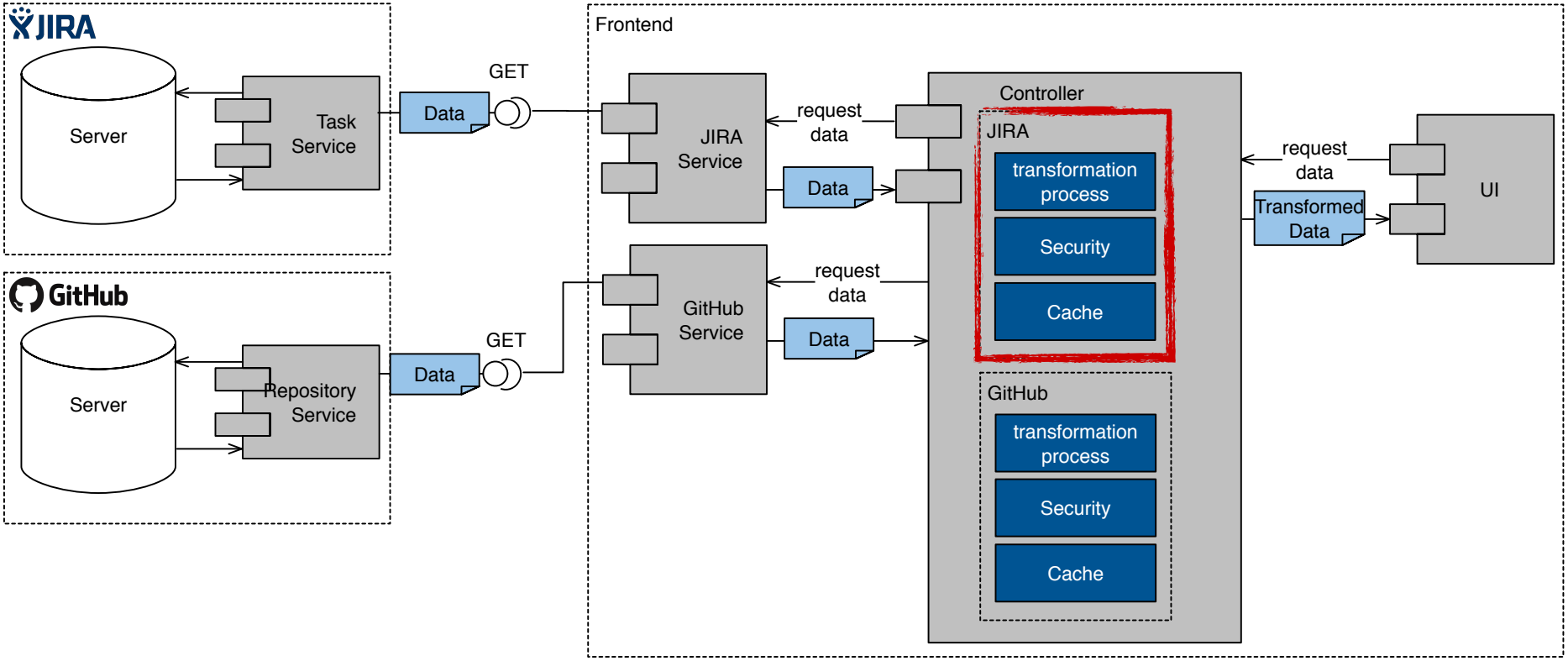
Building an Application in 2017



Where does the data come from?



Architecture of such an application



Problem

For each API manage:

- Transformation process
- Cache
- Security

Leads to overhead in controller and makes it hard to change UI

Research Questions

1. **How to retain a lightweight frontend when scaling up the number of APIs to consume?**
   - How to handle data transformation, cache and security for each API?
2. **How does a model for service consumption of multiple APIs look like?**
   - What information is needed from existing models? (View Model, Data Model, REST API Model…)
3. **How does a technology independent approach look like that can be used with any API?**
   - Can this model be used to generate the code for the consumption of APIs?

Model-Based User Interface Development

- Develop software based on explicit models
- Reference Architecture
- do (semi-) automatic code generation
- High focus on platform independent UI models

Researching Solutions

Approaches dealing with similar problem:

SOA

Architectural style that focusses on structuring and using services

apigee

Managing APIs
Providing:
- Gateway
- Security
- Analytics
- …

WSO2

Design, Create, Publish, Manage APIs

GraphQL

Query Language for Graph APIs

Limitations

- No model provided
- No clear specification
- WSO2 and apigee
  - complex
  - we don’t have control over server

REST API Specification

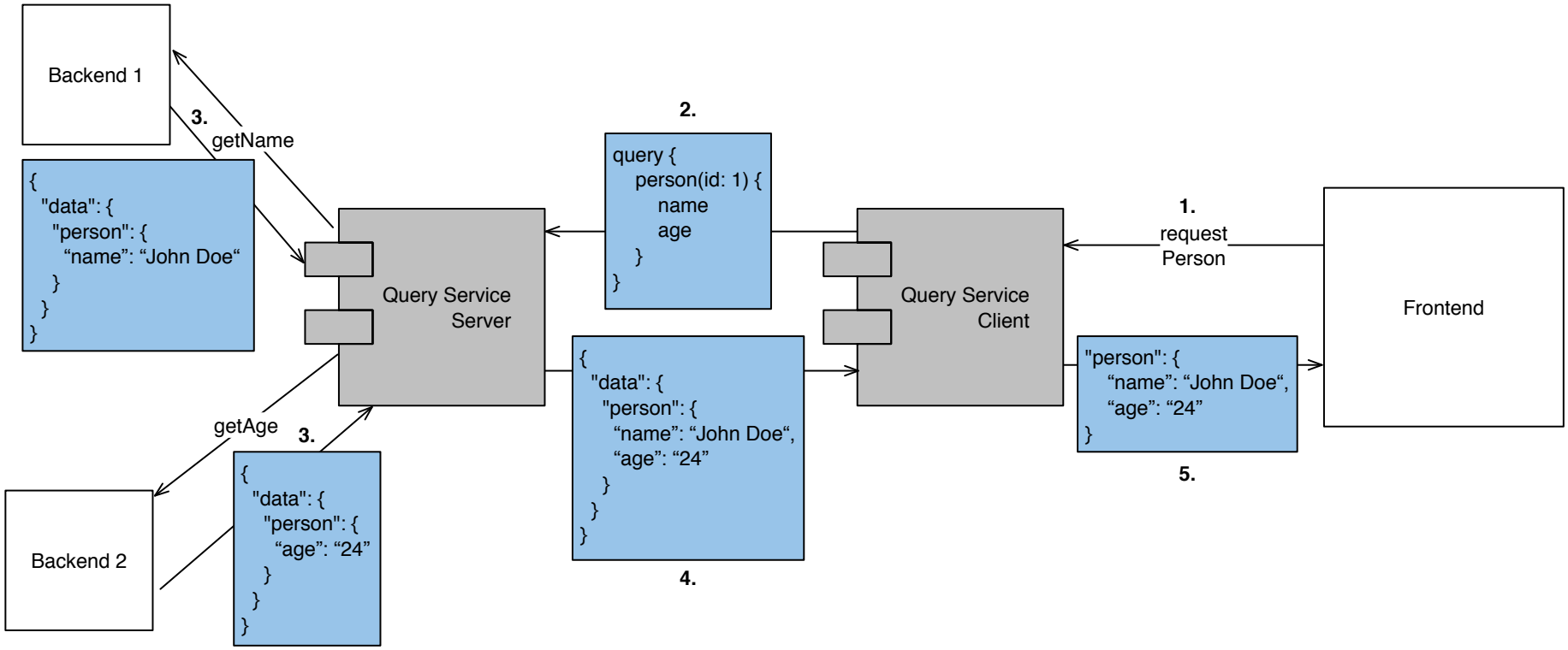
- Describing RESTful APIs for example with:

- Specify
  - accessible resources (in path element)
  - Data Model (in definitions element)
  - Security (authentication)

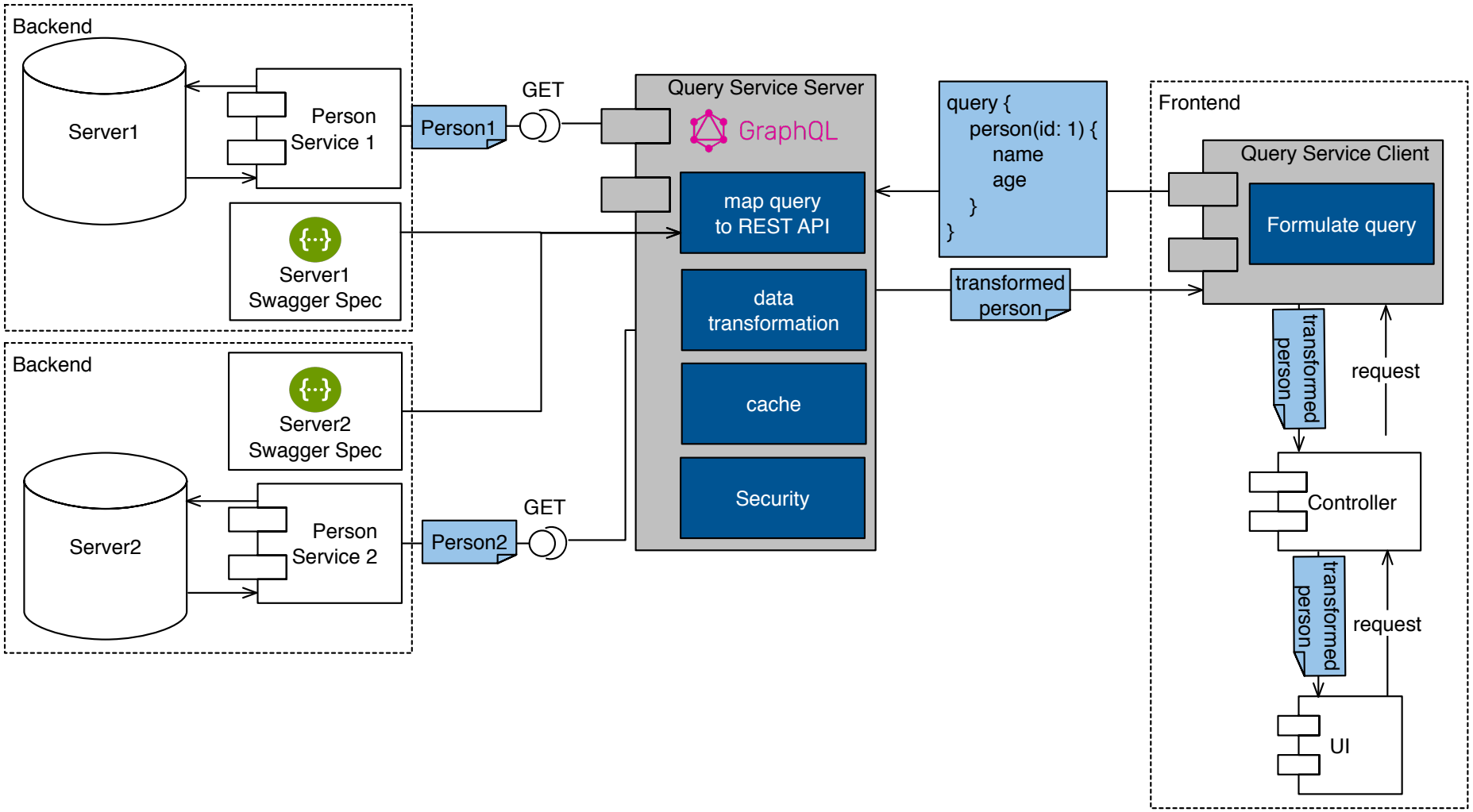
REST API Specification

- Reusing these concepts can help reducing complexity on server
- How to reuse this concept in an architecture?

Solution: Query Service



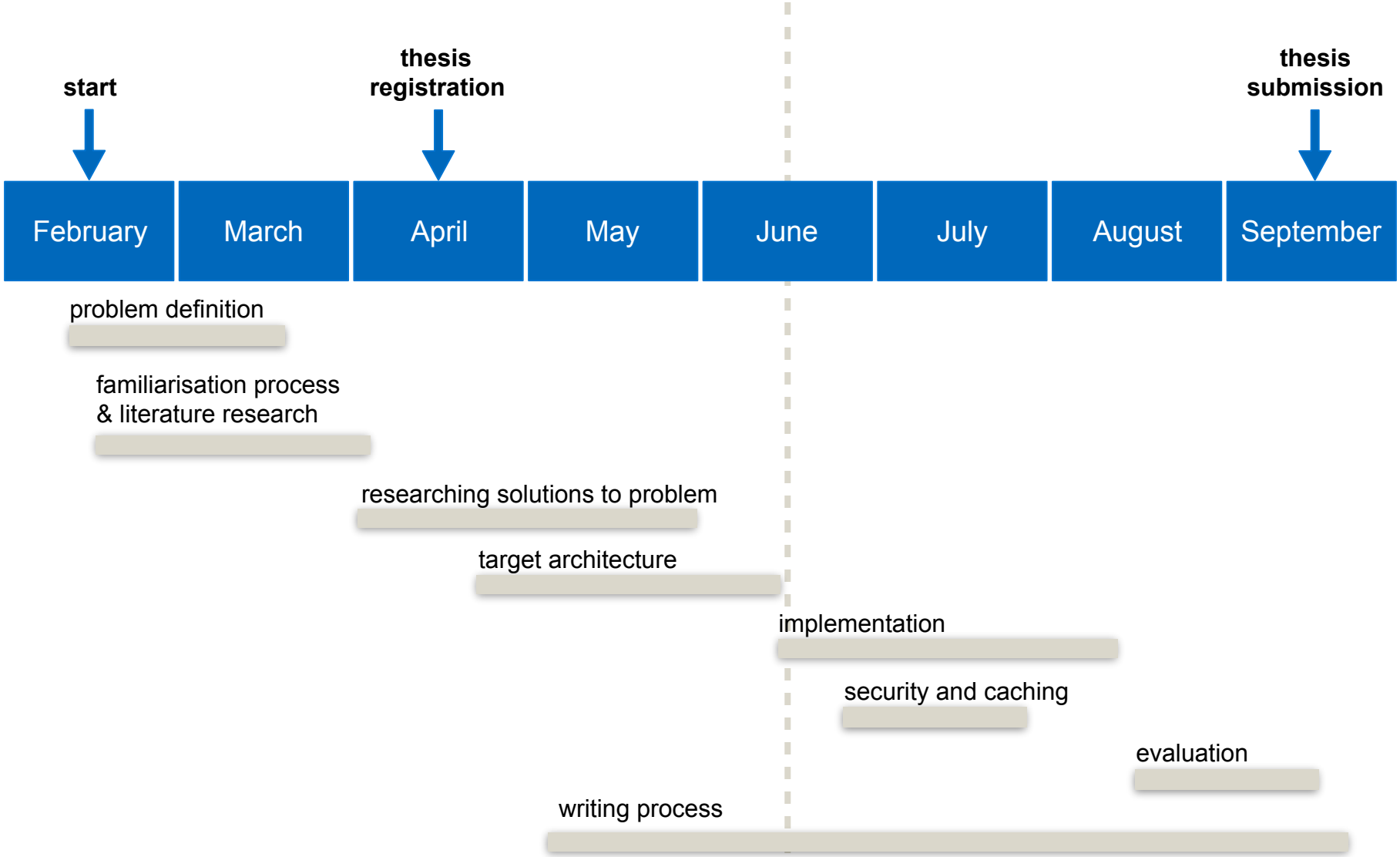
Architecture of Query Service



Advantages of This Approach

- Keep client simple
  - Important for Model-Based User Interfaces
  - Shifting responsibility away form client but not completely to server
- Provide actual server
  - Deliver together with client part
  - Less complex server compared to creating an actual backend
- Ability to deal with complex queries (thanks to GraphQL)
  - Simplify data transformation process

Timeline



Summing up

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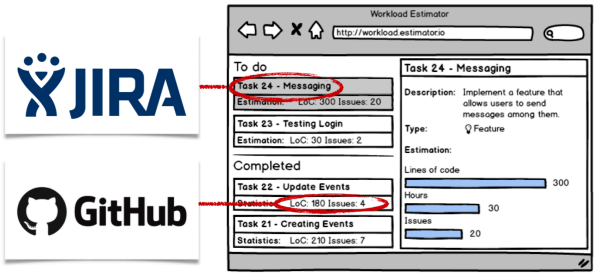
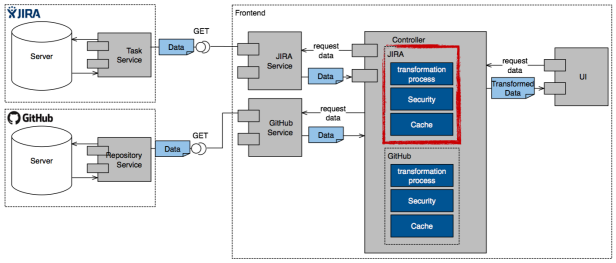


Architecture of such an application



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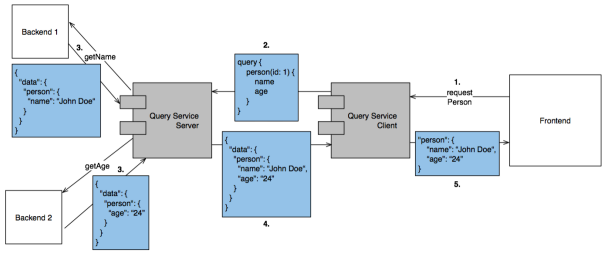

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