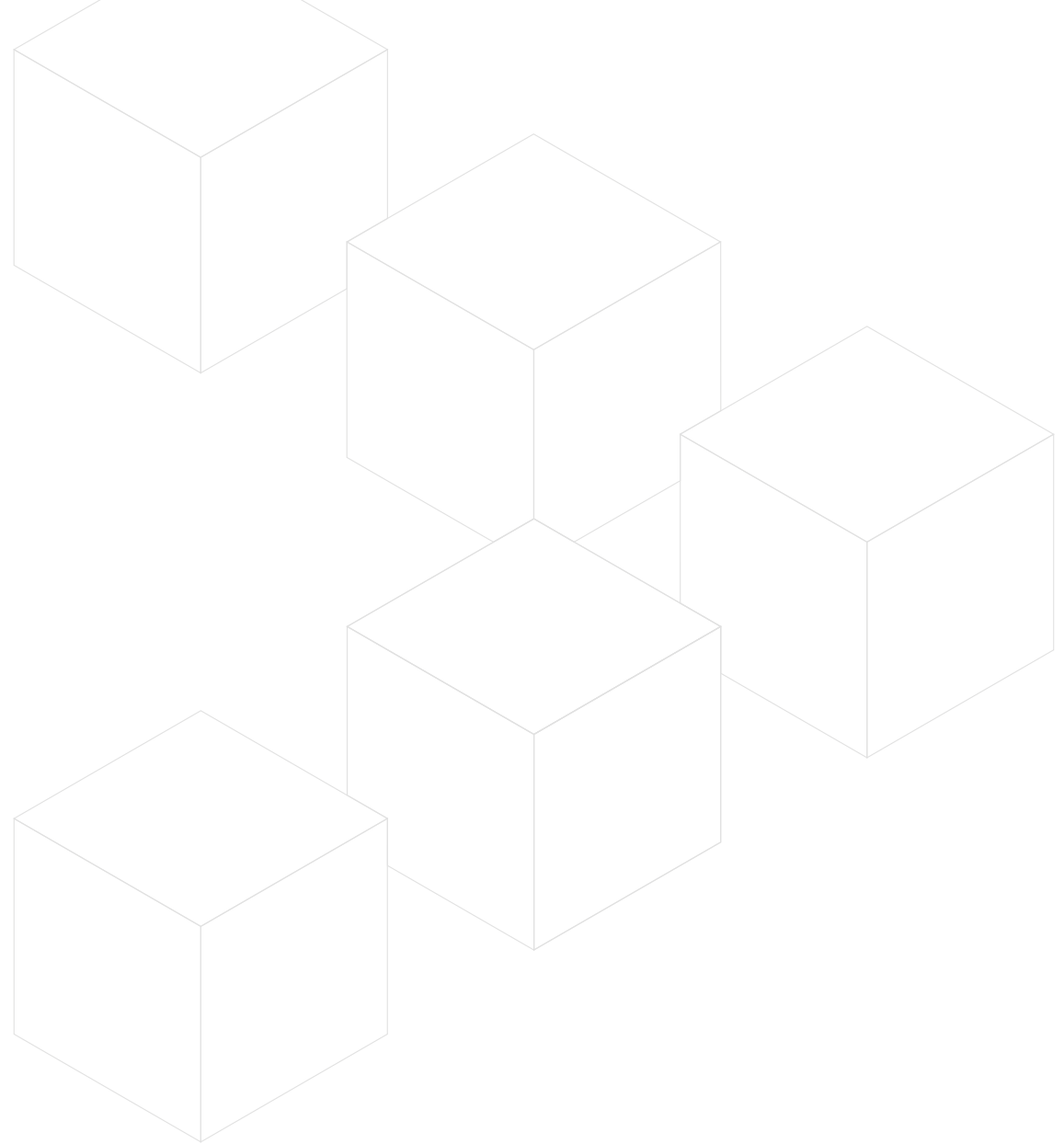


Webengineering

2017-05-29

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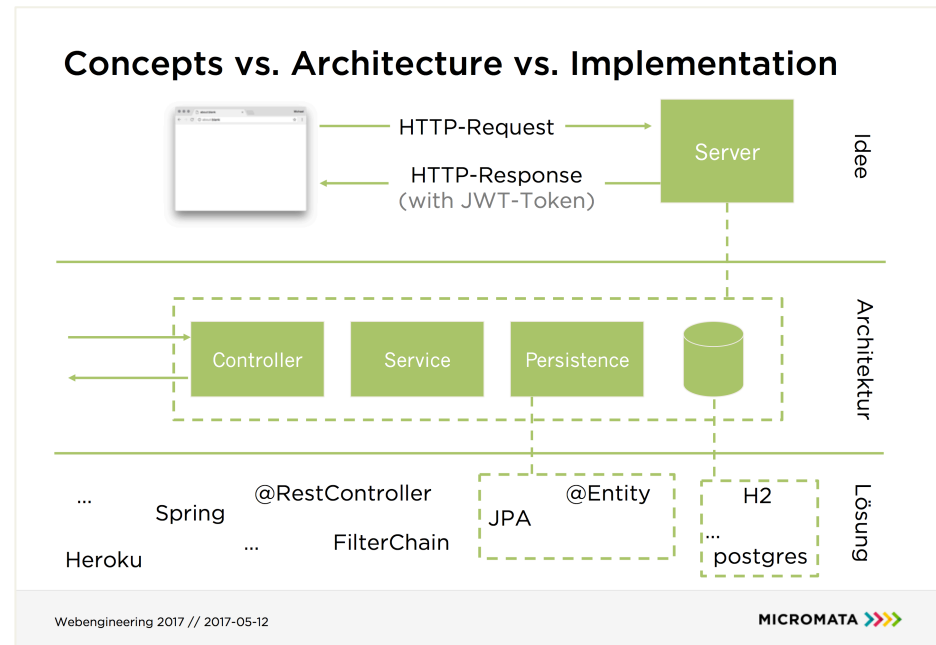
Roadmap 2017-08-29

- Wrap-Up
- What we have not implemented
- Testing (Backend)
- Outlook
 - Next week no lecture (Pfingsten)
 - The following four weeks: frontend

Wrap-up // Backend

Wrap-up Backend

- concept vs. implementation
- consistency & pragmatism
- walkthrough with debugger
- decisions involve trade-offs
 - package structure
 - location of validation
 - amount of tests (follows)
 - ...
- Remember to think about alternatives and your motivation for a particular solution
- (this is project relevant)



What we have not implemented

Current backend implementation is a compromise between

- understandability
- real-world application
- functionality



What we have not implemented

There are a LOT of things which we did not consider in full detail...

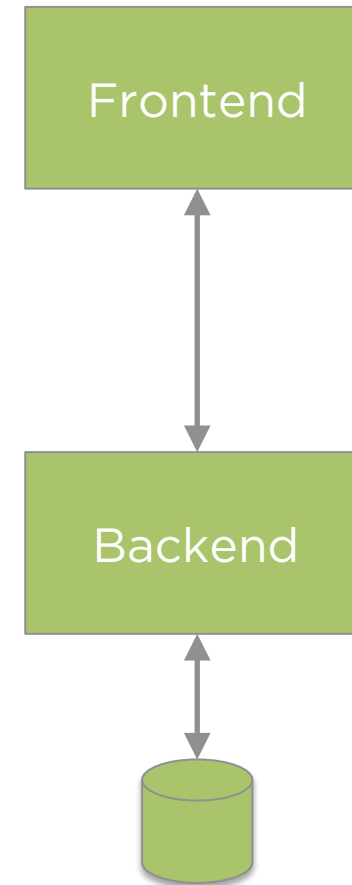
...but are relevant in a real-world application

- Error handling
 - Exception strategy
 - Corner cases
 - Input validation
- Operational issues
 - Updates w/o downtime
 - Deployment strategies (in particular migration, e.g. of database schemas)
 - Logging strategies
- Testing
 - Functional
 - Performance
 - Integration
- Security
 - role management
 - OWASP Top ten

Testing

Frontend- vs. Backend-Tests

- Different responsibilities
 - Frontend
 - user interaction & data flow
 - difficult due to chaotic environment (browsers, ...)
 - Backend
 - business logic
 - technical: persistence, ...
 - Beware: depending on the project's requirements or structure, there is more logic in the frontend
 - BUT: if there is a backend, it should have the final decision
- Today focus on backend testing



What to test (or: 100% test coverage?)

- Testing is extremely hard: [Space Shuttle](#)
 - 420k LOC
 - 260 people working together, discussing every change
 - Last three versions had 1 error / version
 - Last 11 versions had a **total** of 17 errors
- As always: depends on the requirements and the contract
- rule of thumb:
 - functionality before technology
 - high impact before low impact
- Don't test just to increase coverage



Types of tests

- There are a LOT of different testing methods, frameworks, methodologies (see [here](#) for an overview)
- We focus on
 - Unit-Tests
 - Integration tests
 - Performance tests
- Note that this lecture is about showing the approaches for testing and not the extensive testing of the services itself.

The JUnit logo consists of the word "JUnit" in a bold, sans-serif font. The "J" is green, and the "Unit" is red.The Apache JMeter logo features a stylized feather icon to the left of the text "APACHE JMeter". "APACHE" is in red, and "JMeter" is in black. A trademark symbol (TM) is located to the upper right of "JMeter".

No formal exercises today, but we can...

- walk through YOUR code such that you have your own working backend as basis for the frontend part
- discuss your design decisions
- write some tests together

Remember: next week is Pfingsten, hence no lecture