



If This Then What? - Agile Engineering of IoT Applications

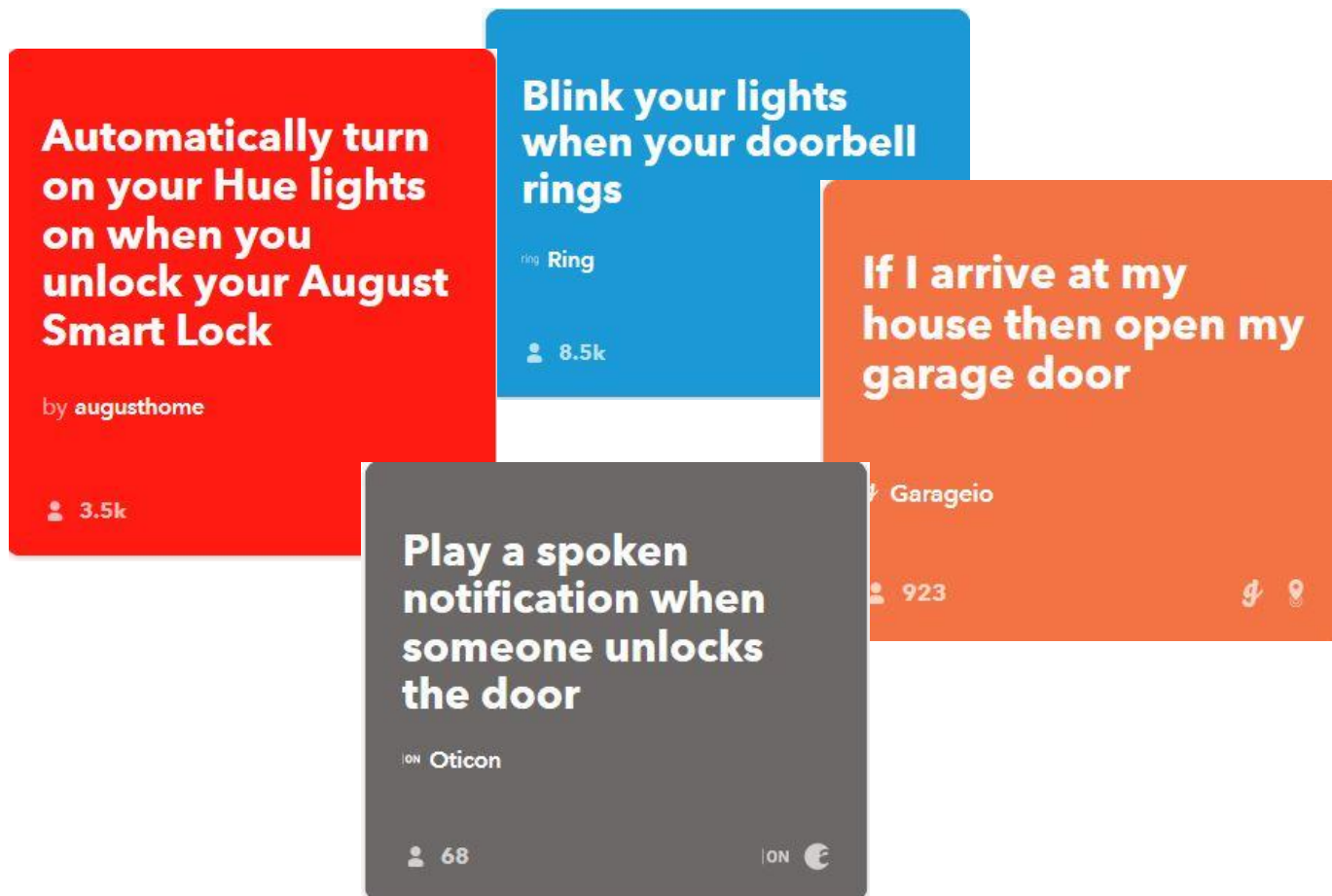
- An European Master Team Project in Cooperation with Babeş-Bolyai University Cluj

Supervisor: Fabian Burzlaff

Reviewer: Prof. Dr. Heiner Stuckenschmidt

Goal

Gain hands-on experience with implementing IoT apps in combination with state-of-the-practice programming frameworks

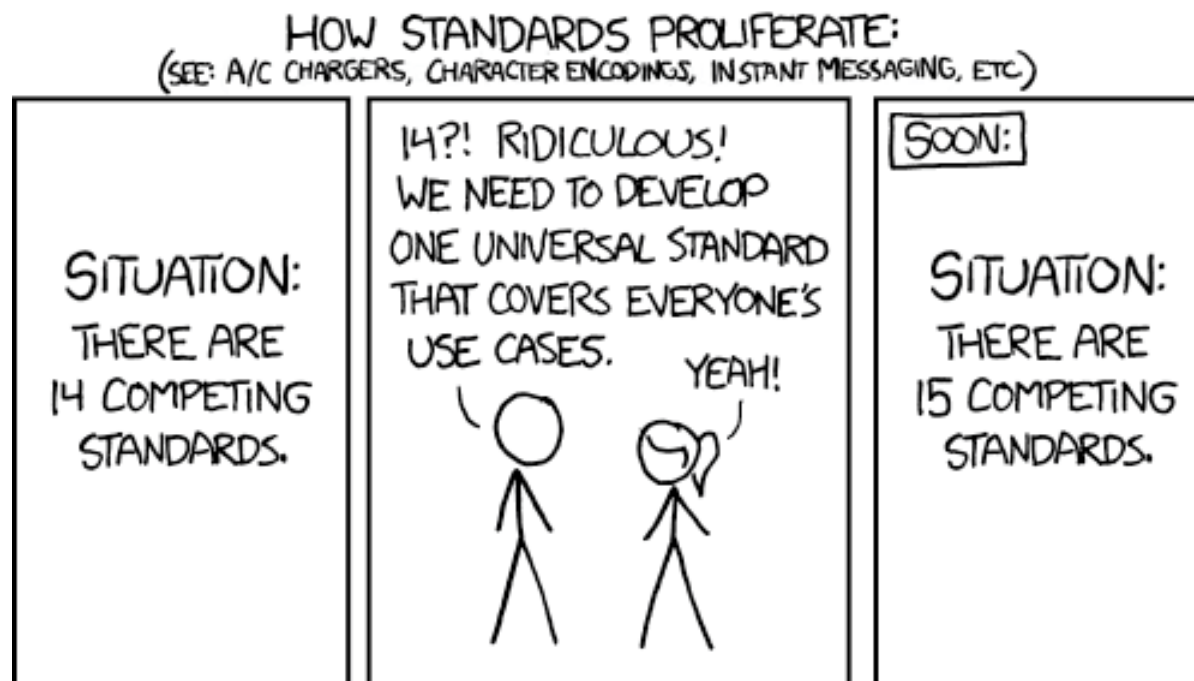


Goal

Gain hands-on experience with implementing IoT apps in combination with state-of-the-practice programming frameworks

Problem

Unfortunately, there exists no single data- and service model to control all devices



Goal

Gain hands-on experience with implementing IoT apps in combination with state-of-the-practice programming frameworks

Problem

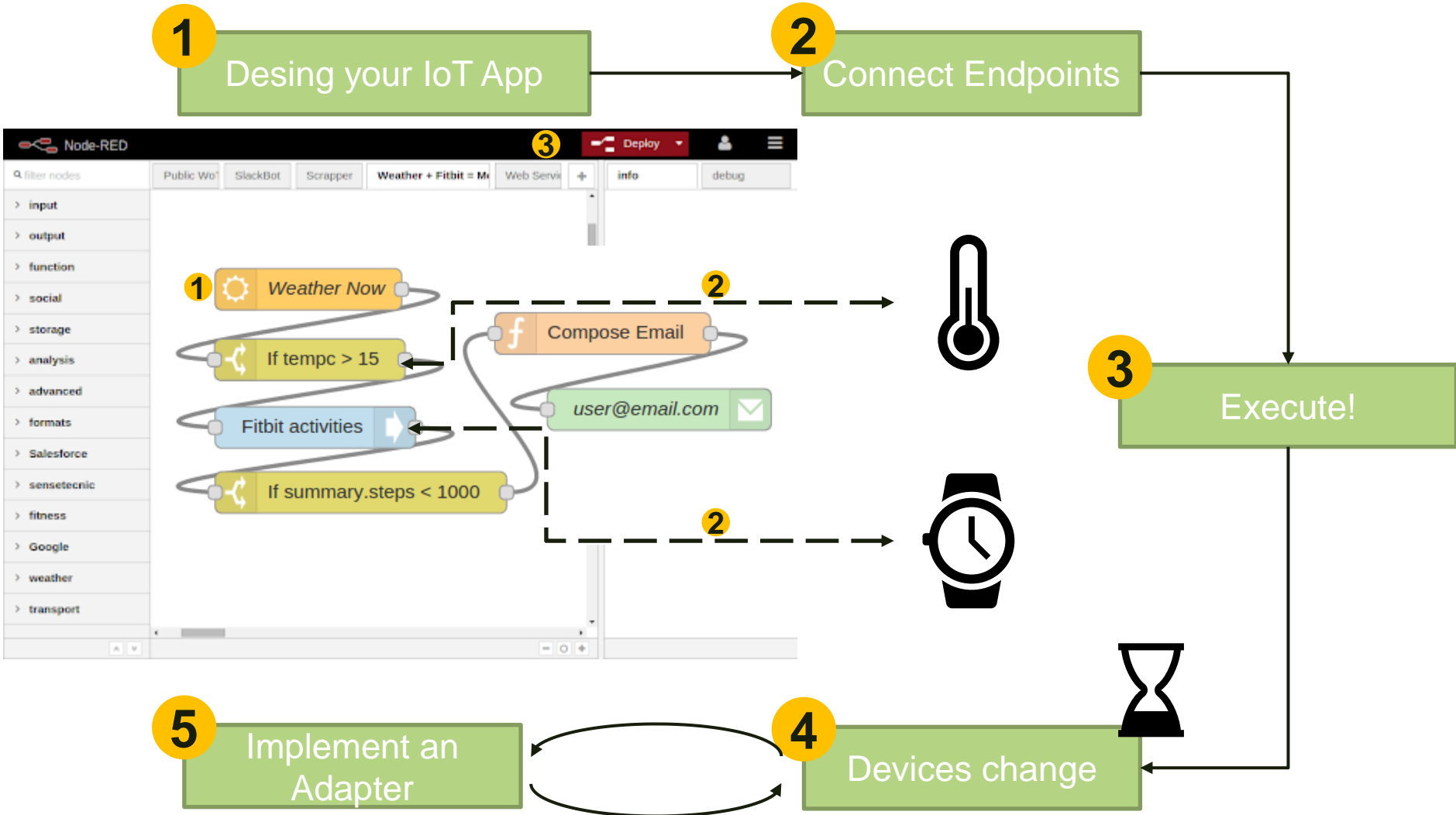
Unfortunately, there exists no single data- and service model to control all devices

Task

- Develop visual automation flows for your smart home scenarios
- Integrate available IoT devices and web services using their interfaces into your flow
- Execute your scenarios on different infrastructures



Technical Environment



Challenge

Can you beat classical adapter implementation using a novel, web-based integration tool?

The screenshot shows a web-based integration tool interface. At the top, there are tabs for "Transformation" and "Add API", and a user email "burzlaff@es.uni-mannheim.de". Below this, there are dropdown menus for "Mapping Source" (PhillipsLight), "Mapping Target" (Lifx_Light), "Operation" (controlLight), and "Response" (200). The main area is divided into three panels: "Source Request Body", "Mapping Area", and "Target Request Body".

Source Request Body:

- body
 - switch_phillips
 - color
 - brightness
 - color_temperature
 - alert
 - effect
 - dimmer_switch
 - flag
 - status

Mapping Area:

- body → parameters.on
- body → parameters.colorlight
- body → parameters.brightnesslight
- body → parameters.temperaturelight

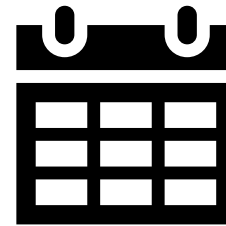
Target Request Body:

- parameters
 - on
 - brightnesslight
 - colorlight
 - temperaturelight
 - optionalParam

At the bottom, there is a "Test Mapping" button with a tooltip "Expand this to test a request with your current mapping". There are also "Reset", "Build Adapter", and "Finish Mapping" buttons.

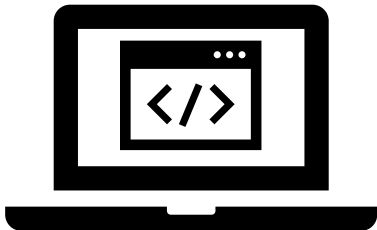
Organization

- M.Sc. Business Informatics
- Language: German/English
- The project starts October 2020
- Duration: 6 months (1 semester)
- Team members: 2-3 Mannheim students and 2-3 Cluj students



Possible Technologies and Frameworks:

- Node-RED: <https://nodered.org/>
- Web-based Integration Tool: <https://integrateit-41c60.web.app/>
- Frameworks: Angular, Google Firebase, OpenAPI, Mockoon, POSTMAN



Requirements

- Programming skills (e.g., Java, JavaScript)
- Experience in version control systems (e.g., Git)
- Beneficial: Know-How in Software Architectures (e.g. Event-driven Services or Microservices)
- Desirable soft-skills:
 - Open-minded character
 - Outstanding teamwork
 - Great communication skills
- Last but not least: High motivation and interest in the topic!



Thank you for your attention!



Fabian Burzlaff

University of Mannheim | Institute for Enterprise Systems (InES)
L 15, 1-6 | 4thfloor | 68131 Mannheim | Germany

burzlaff@es.uni-mannheim.de

<http://www.institute-for-enterprise-systems.de>