

Introduction to the Internet of Things

Session 04

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Lecture Participation is Optional

- You don't need to come
- You don't need to sign sheet in lecture
- Labs are mandatory
- Learning lecture content through small research projects is also mandatory (but can be done at home) and will only be graded after lecture finishes – this is similar to the final exam where lecture content is assessed at the end of the lecture

So far

- How does this lecture work
- IoT initial perspective
- HW buses
- Story driven development
- IoT exchange formats, protocols

Scaling and Testing

- What will be issues scaling (system size, number of systems, management)?
- How can we do testing?
- What role will play
 - Simulator(-component)s?
 - MQTT
 - Stories?
- Think and discuss 10 minutes (with neighbor/s) – write down at least 2 common points for each.
- Open discussion

Scaling and Testing [answers]

- What will be issues scaling (system size, number of systems, management)?
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IoT Frameworks (1)

How can we develop and manage software faster for IoT?

- Kai Wähler: *IoT Open Source Integration Comparison* (part 1 0:00-11:29)
<https://www.youtube.com/watch?v=uOrLOgsCpNE>
- What are the key challenges of IoT and why?
- What is/are the generic solution(s) for it?
- Two examples for used patterns.
- Definition/relation of cloud, edge, fog.
- Two advantages of edge/fog computing.

IoT Frameworks (2)

How can we develop and manage software faster for IoT?

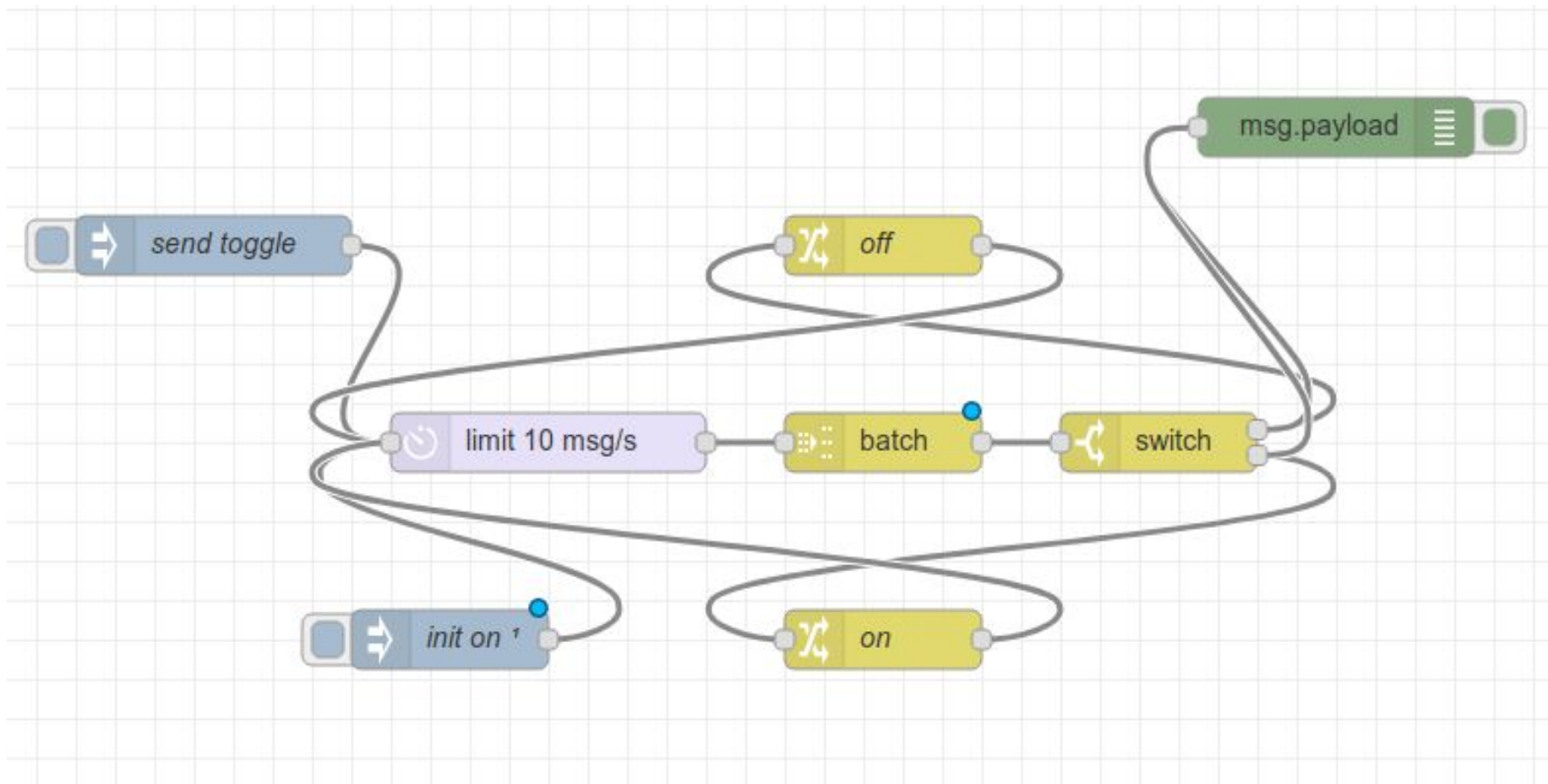
- Kai Wähler: *IoT Open Source Integration Comparison* (part 2 11:29-18:27)
<https://www.youtube.com/watch?v=uOrLOgsCpNE>
- What are the different categories of the presented frameworks?
- What are the main features of each category?
- Four or more examples of applications.
- Four or more examples of available tools.
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- Which framework did you like best and why?

IoT Frameworks (3)

How can we develop and manage software faster for IoT?

- Kai Wähler: *IoT Open Source Integration Comparison* (part 2 18:27-48:27)
<https://www.youtube.com/watch?v=uOrLOgsCpNE>
- Three common features
- Target audience
- Advantages and disadvantages of each.
- Relation to the cloud?
 - What is available/characteristics?
 - Where do these fit?
- Which framework did you like best and why?

Node-RED introduction



Lab 4

- Build the physical temperature sensor (preferably based on the DS18x20 – also in blue box) and a physical relay switch with one ESP8266 each and connect them to mqtt
- Check their functionality with mqtt.fx and with the integrator and respective simulator components
- Rebuild the integrator in node-red and add a gui with a button and a temperature chart.
- Control a rgb-led connected to an esp8266 from a node-red dashboard color-picker via mqtt.