



... in the Internet of Things

Bachelor Project (PO)
Scenario Description
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Secure smart home

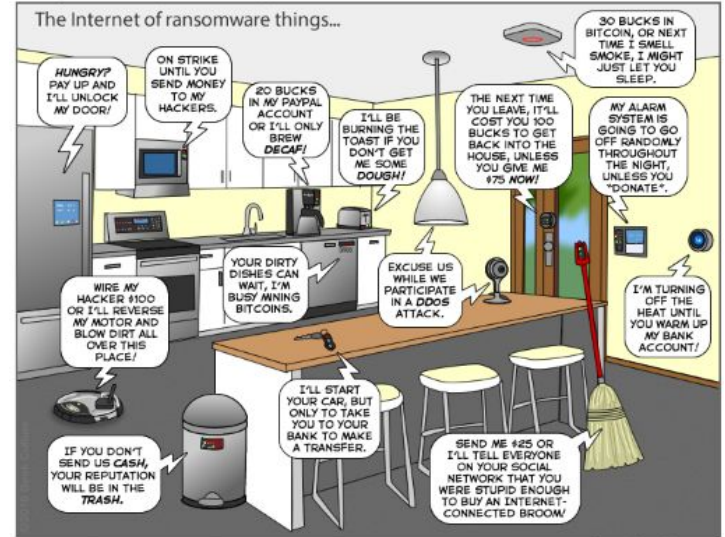
The Challenge of **Security**

Motivation

+30 billion devices by 2027

- **Security**
 - Rise of cybercrime.
 - We need: **C**onfidentiality, **I**ntegrity, **A**uthentication.
- **Interoperability**
 - Increasing number of vendors with custom solutions, results in incompatibility silos.
 - Open standards help foster better communication between devices from different vendors.
- **Open implementations**
 - Reduce development costs.
 - Accelerate innovation.
 - Open review process enhances security.

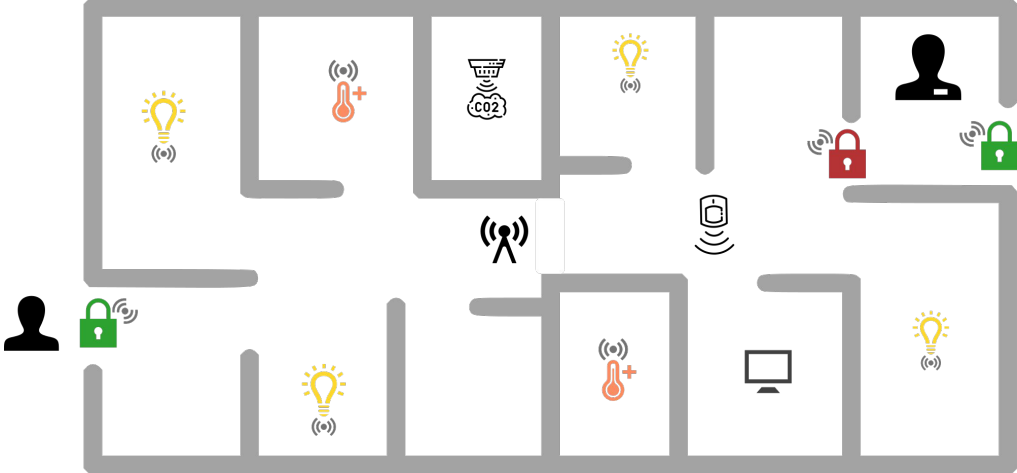
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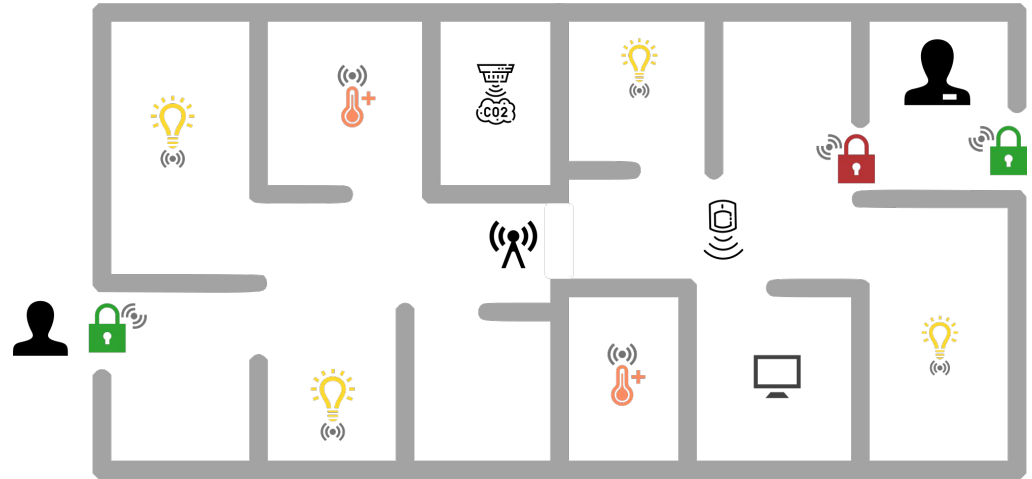
Application scenario: Secure Smart Home IoT



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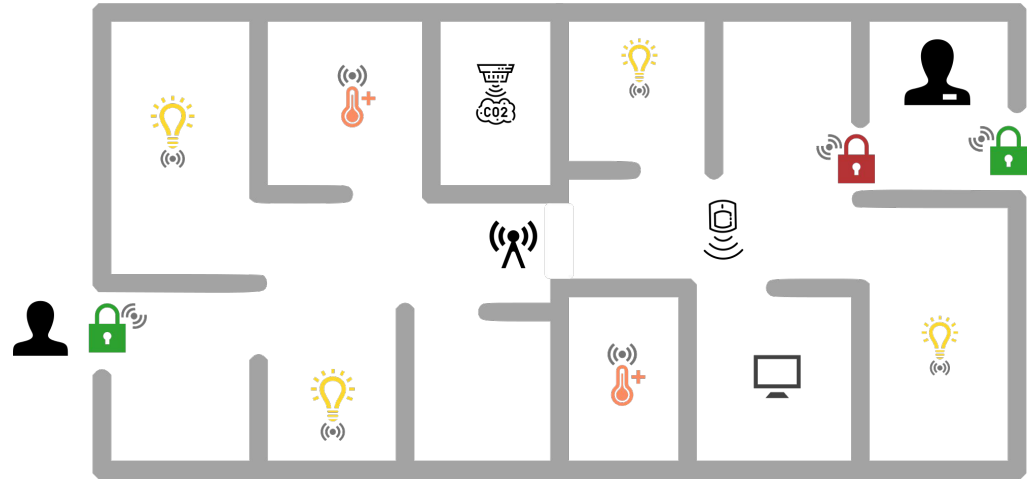
High-level goals

- User friendliness
- Low cost (hardware)
- Secure by design
- Scalability
- Configurability

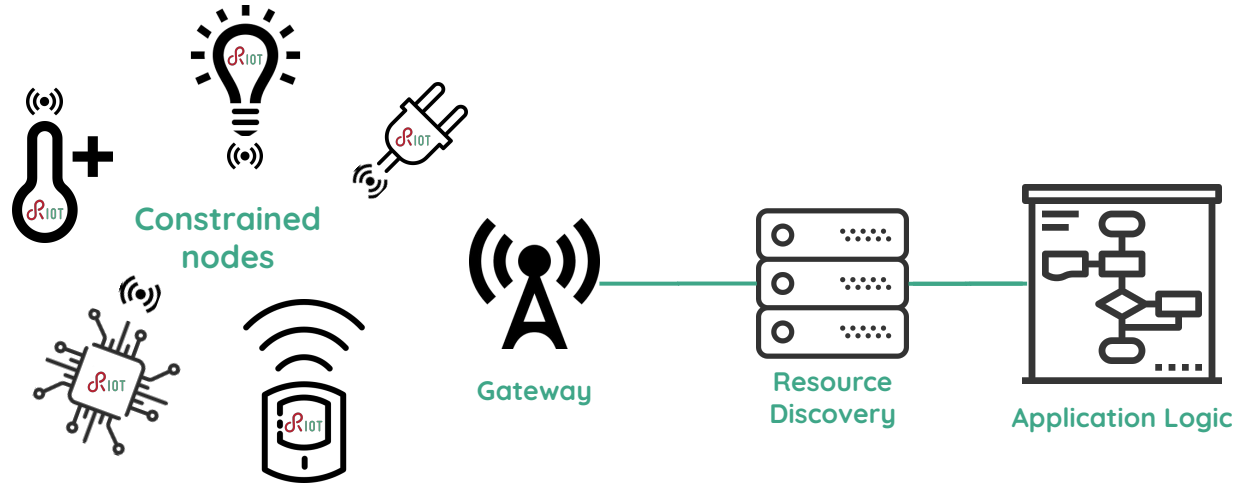


Technical requirements

- Devices can be securely added as plug-n-play
- Devices can be managed and operated
- The system supports multiple users
- Users have roles and access rights
- Users should authenticate themselves



Technical overview

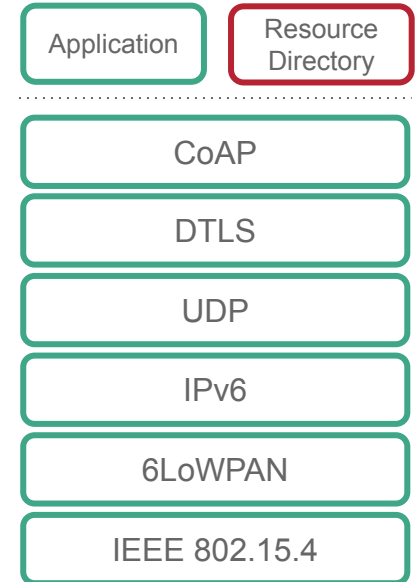


Technologies

We will utilize open standards to ensure security and interoperability

- Resource discovery: **CoAP - Resource directory**
- Application: **CoAP, Link Format**
- Transport: **UDP + DTLS**
- Network: **IPv6 + 6LoWPAN**
- Radio + MAC Layer: **IEEE 802.15.4**

- User authentication: **FIDO2**



Typical IoT networking stack

Formalities & Tools

- **Tools**
 - **MS Teams**
 - **GitHub**
 - Everyone should send to MS Teams
 - Name
 - GitHub handle
 - HAW email address
 - Project code will be in <https://github.com/smartuni>
- **Milestone presentations**
 - Mandatory and on site: 3 + 1 presentations, slides, documented source code checked-in
- **Final documentation:** Hackster.io (to be clarified)
 - Project documentation and description linked to GitHub repository
 - <https://www.hackster.io/riot-os>

Questions?