

Semantic Gateway as a Service architecture for IoT Interoperability

Pratikkumar Desai, Amit Sheth and Pramod Anantharam

Presented by Jialiang Yu

Outline

- Introduction
- Interoperability Issues
- Background
- Semantic Gateway As Service (SGS)
- Multi-Protocol Proxy
- Semantic Annotation Service
- Gateway Service Interface
- Conclusion

Introduction

- Internet of Things is the future
- Bring computations closer to our lives
- So many ways to do things
- Interoperability (**issues**)

Interoperability Issues

Network layer interoperability

- Physical interoperability (Hardware)
- By pass(not for this paper)

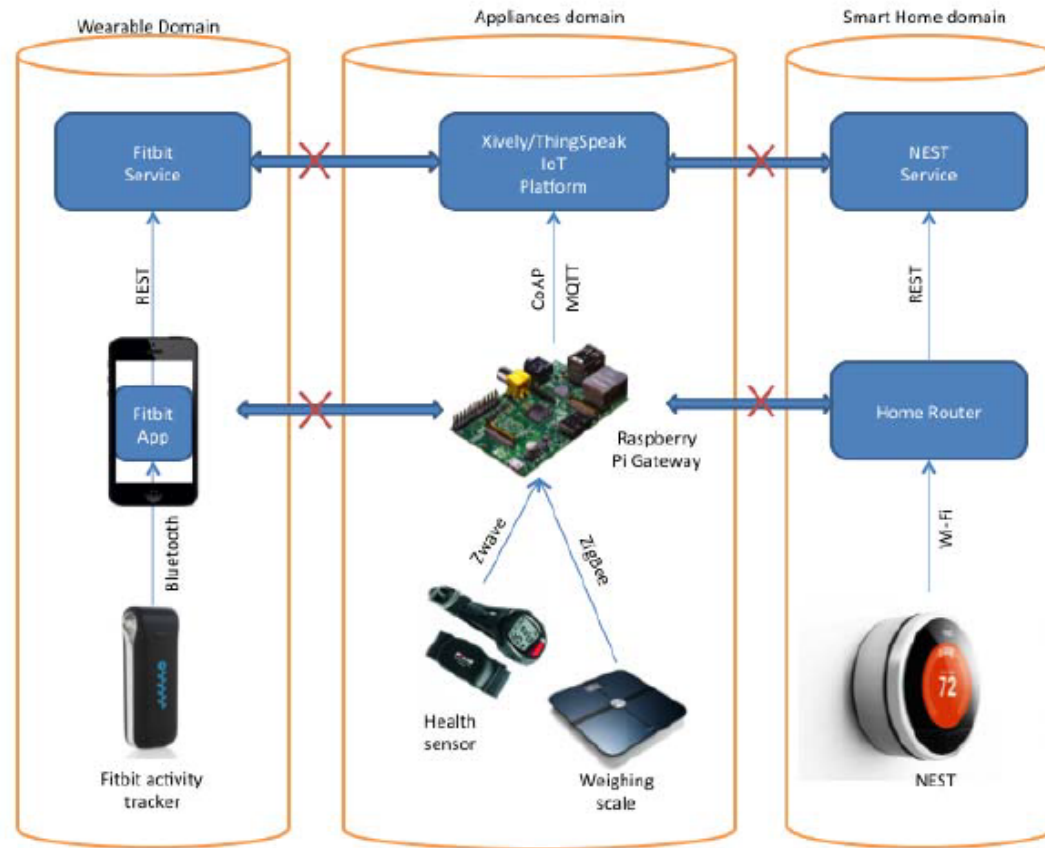
Interoperability between messaging protocol

- CoAP, MQTT and XMPP
- Devices can not talk to each other if they are not in the same protocol

Interoperability at data annotation level

- Data lacks semantic annotation
- Can not have practical applications

Interoperability Issues



Background

- Protocol
- Try to resolve all issues by one protocol
- SWE, W3C and SemSOS
- Not too efficient

Semantic Gateway As Service (SGS)

Semantic IoT Architecture

- Application models can not talk to each other due to data issues
- Most require third party applications
- Can do better before reaching to Internet

Semantic Gateway As Service (SGS)

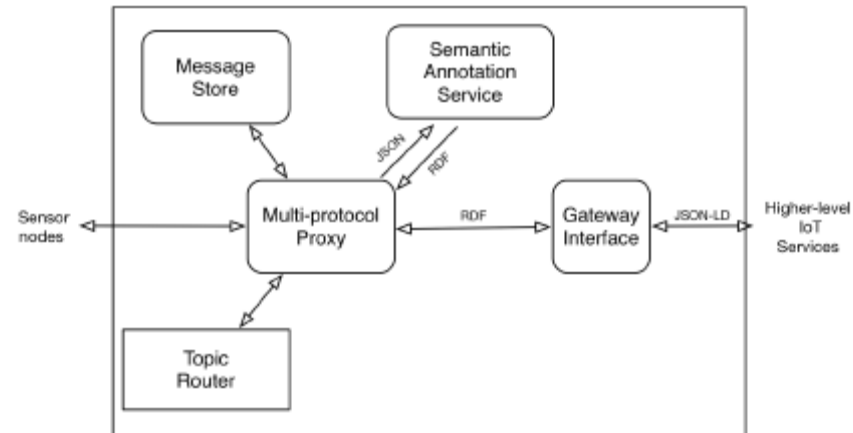


Fig. 3. SGS architecture

Semantic Gateway As Service (SGS)

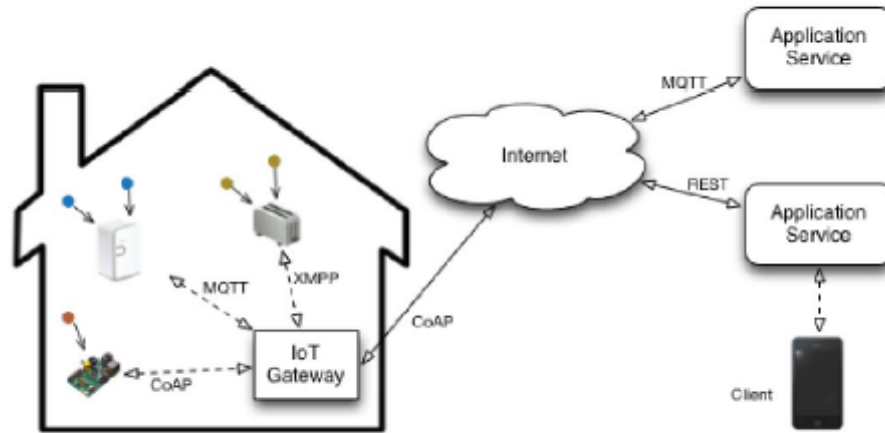


Fig. 2. Proposed IoT architecture with Semantic Gateway.

Semantic Gateway As Service (SGS)

- Multi-protocol proxy
- Semantic annotation
- Gateway service Interface

Multi-Protocol Proxy

- CoAP
- MQTT
- XMPP

Multi-Protocol Proxy

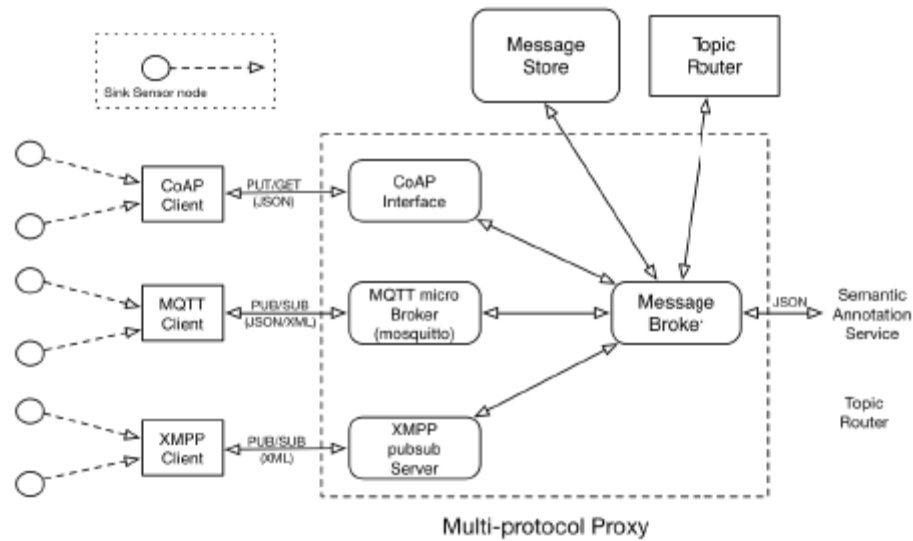
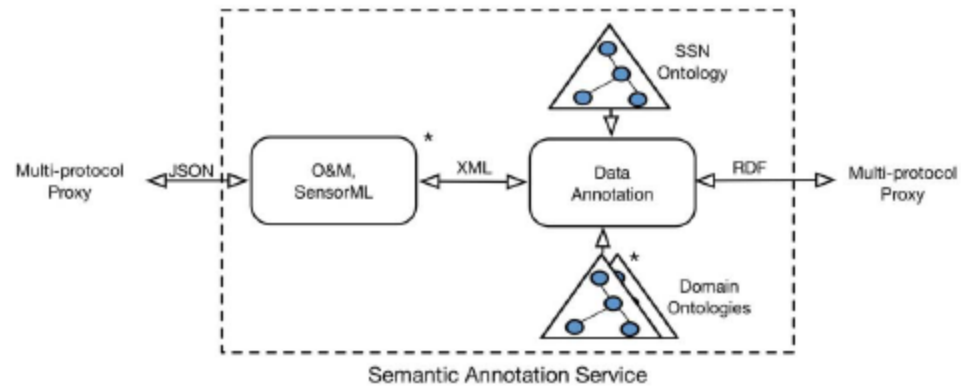


Fig. 4. Multi-protocol proxy, communicating with sensor nodes.

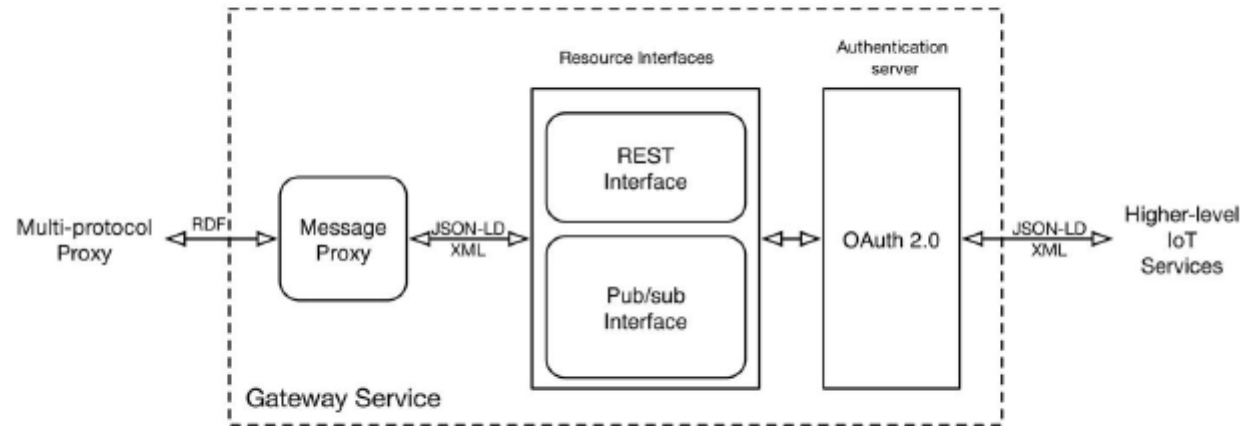
Semantic Annotation Service

- Service description and discovery
- Sensor and observation description
- Domain specific descriptions

Semantic Annotation Service



Gateway Service Interface



(a)

Conclusion

- SGS is an efficient way to solve interoperability issues
- SGS integrates different protocols
- SGS provides semantic services
- SGS can provide extra services
- Solve big data variety problems
- Good in theory but still require test data

Question