

Urban Traffic-light Control in IoT (IoT-UTLC) Project

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Outline

1. Introduction

2. IoT-UTLC Project

3. Conclusion

Context

Introduction

IoT Applications

- ➡ Health care
- ➡ Transportation
- ➡ Industry
- ➡ Market
- ➡ School
- ➡ Vehicles
- ➡ Smart Home
- ➡ Agriculture



Figure 1: IoT Applications

Context

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- ➡ **Transportation**
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- ➡ Agriculture



Figure 1: IoT Applications

Outline

1. Introduction

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3. Conclusion

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2. IoT-UTLC Project

3. Conclusion

1. Conception

2. Implementation

3. Results

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2. IoT-UTLC Project

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2. Implementation

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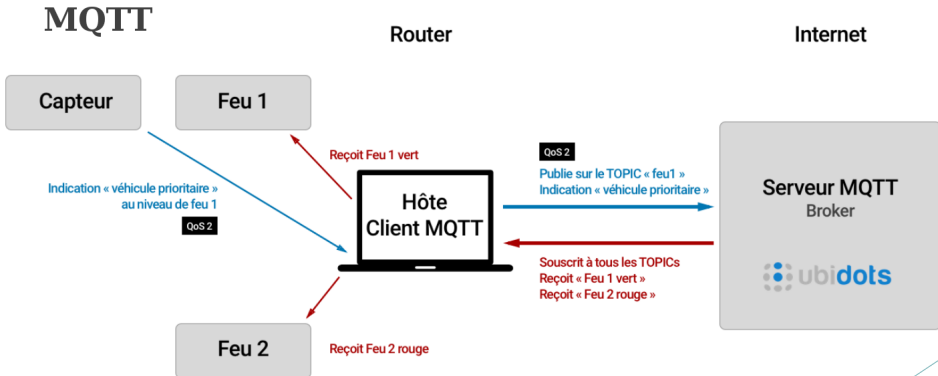


Figure 2: Plateforme UTLC

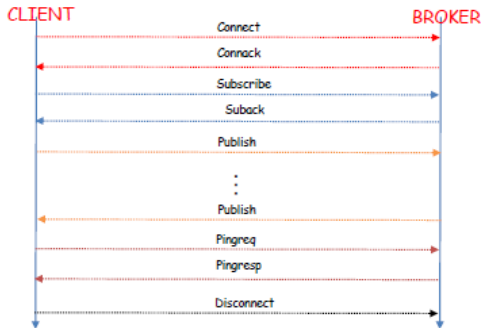


Figure 3: Publish and Subscribe

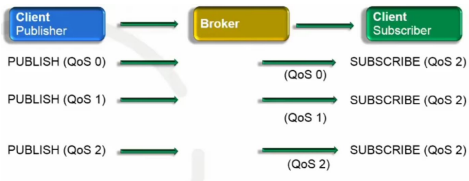


Figure 4: Publish and Subscribe

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Technical choice

Implementation

➡ ZOLERTIA RE-MOTE

- ➡ Low consumption component
- ➡ ADC port for placing sensors on it

➡ CONTIKI OS

- ➡ Operating system for wireless and low power development
- ➡ Support for newer standards (6LowPAN, RPL, CoAP, MQTT)

➡ 6LowPAN

- ➡ Based on IPv6 and IEEE 802.15.4
- ➡ IPv6-based network with low power consumption
- ➡ Ability to create a mesh network

➡ Sending packages

- ➡ UDP in the 6LowPAN network
- ➡ MQTT between the cloud platform and the router

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Results

Comparison

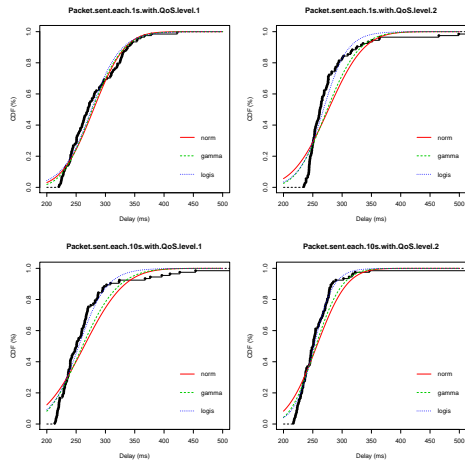


Figure 5: Distributions

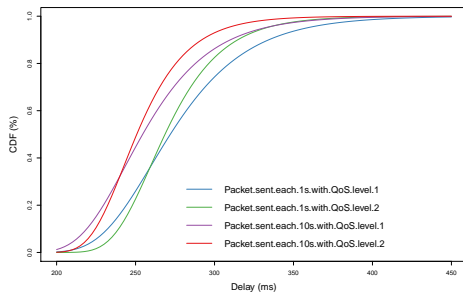


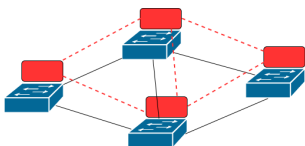
Figure 6: CDF comparison

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Traditional Network Architecture



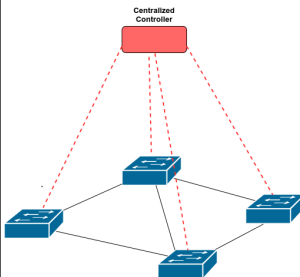
Physically
Coupled in
the Same
Hardware



Control Plane: Complex Distributed Algorithm for Establishing Route

Data Plane: Simple Packet Forwarding

SDN Network Architecture



Data Plane: Fast, Dumb, Flow Based Switches

Control Plane: Physically separated, programmable, smart and centralized controller

Figure 7: Traditional vs SDN Network

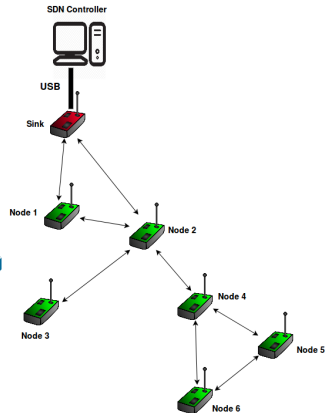


Figure 8: SDN-Controller

Conclusion

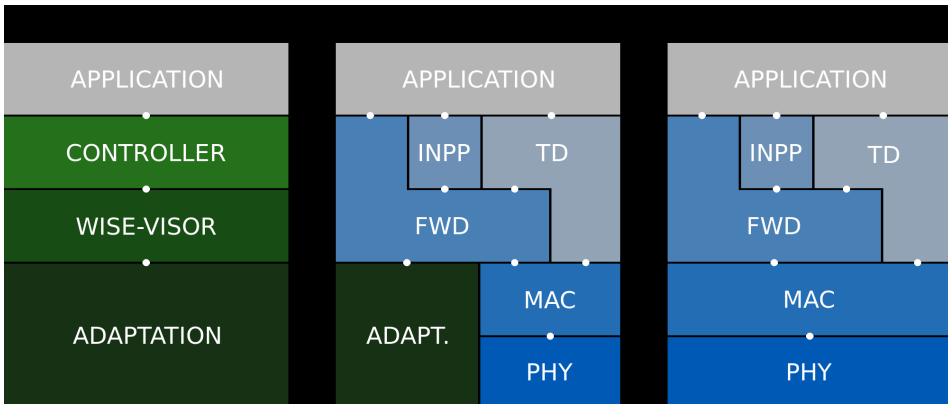


Figure 9: SDN-WISE

Conclusion

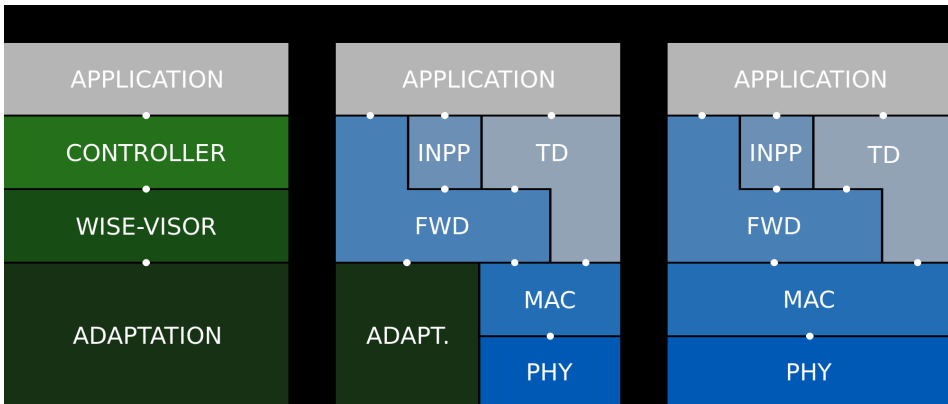


Figure 9: SDN-WISE

Thank you

Outline

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- 3. Conclusion

References