

# 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

## Introduction

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- ➡ Industry
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- ➡ Agriculture



Figure 1: IoT Applications

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1. Conception

2. Implementation

3. Results

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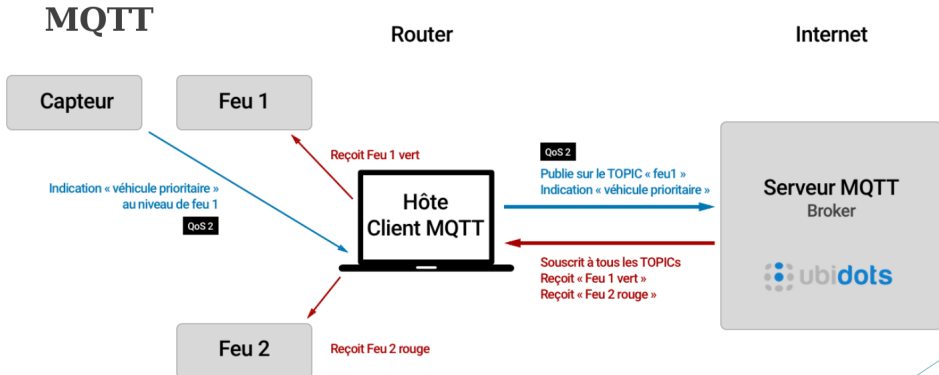


Figure 2: Plateforme UTLC



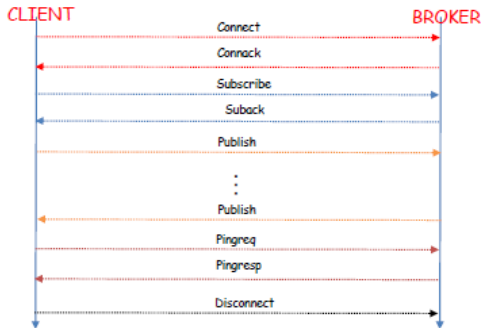


Figure 3: Publish and Subscribe

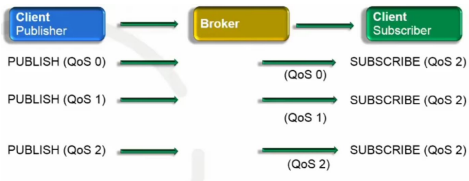


Figure 4: Publish and Subscribe

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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

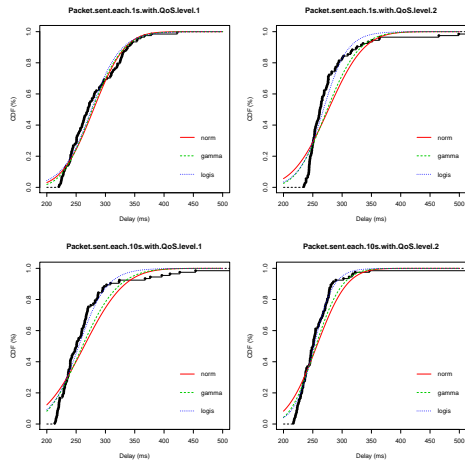


Figure 5: Distributions

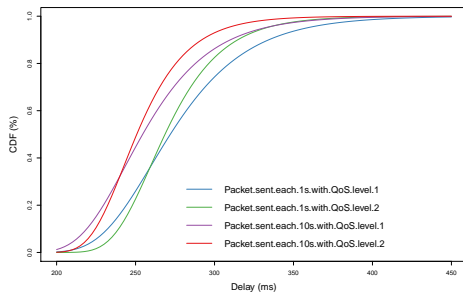


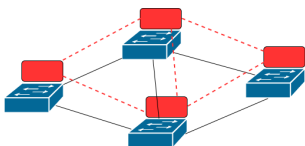
Figure 6: CDF comparison

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- 3. Conclusion**

# Conclusion

Traditional Network Architecture



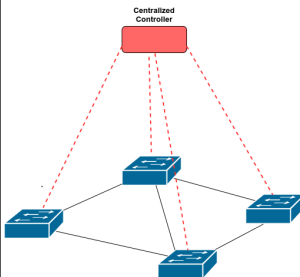
Physically  
Coupled in  
the Same  
Hardware



**Control Plane:** Complex Distributed Algorithm for Establishing Route

**Data Plane:** Simple Packet Forwarding

SDN Network Architecture



**Data Plane:** Fast, Dump, Flow Based Switches



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

Figure 7: Traditional vs SDN Network

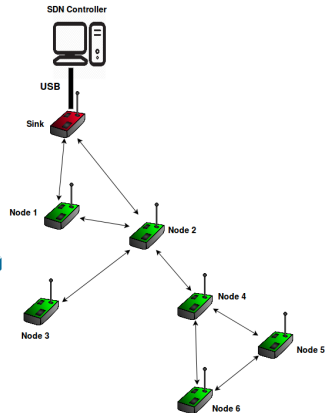


Figure 8: SDN-Controller



# Conclusion

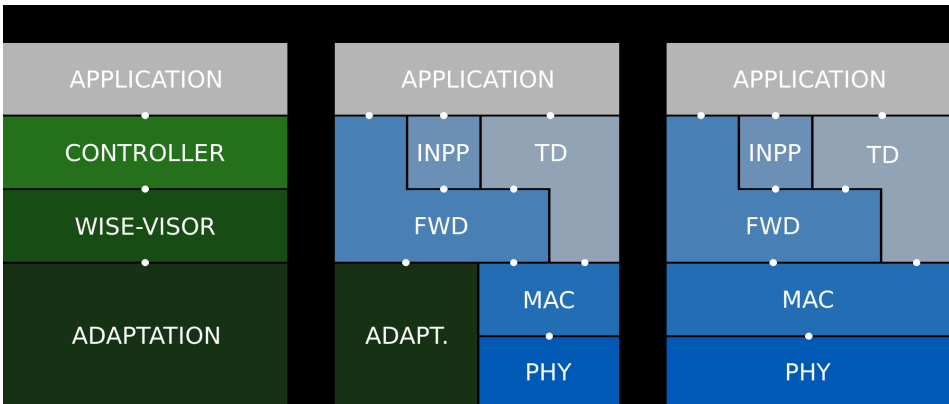


Figure 9: SDN-WISE

# Conclusion

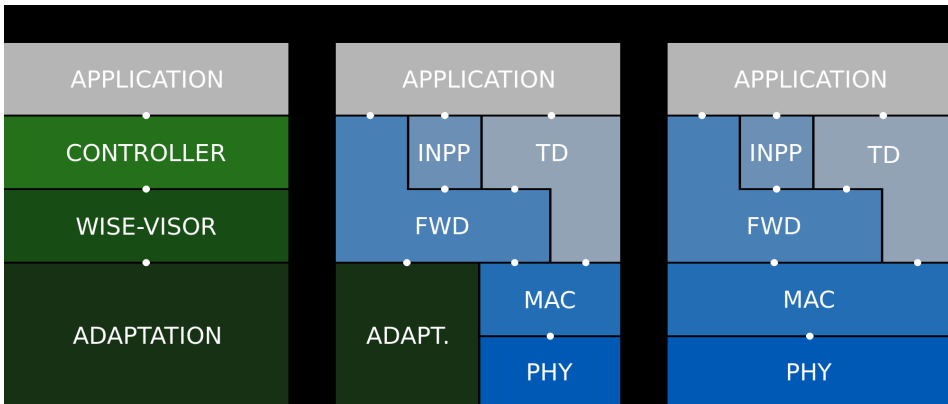


Figure 9: SDN-WISE

# Thank you !

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1. Introduction
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  1. Conception

2. Implementation
3. Results
3. Conclusion

## References