

# Building Smarter Homes with IoT: Harnessing MQTT, Zigbee, and LoRa

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*Abstract—*

## I. INTRODUCTION

## II. BACKGROUND

Communication in IoT is dependent on wireless communication cause to connect all things by wire would quickly cover much of our space with wires and our wire-bill would match if not supersede the remaining infrastructure. Wireless communication could better be described as radio signals at a frequency depending on what protocol that is used. The most common standard today in homes, offices and café is IEEE 802.11, containing the WiFi protocol. Communicating at 2.4GHz and 5GHz cause of radio regulatoric reasons where there is only a few open slots available on the ISM-band. One problem for IoT end devices that could be running on battery and WiFi is power consumption. WiFi is designed for high bandwidth and range resulting in higher power consumption and for this reasons other standards has been introduced to IEEE 802 family.

IEEE 802.15.4, which goes under the name Low-Rate Wireless Personal Area Network (LR-WPAN) is written with low power consumption in mind. The standard is grandfather of protocols such as Zigbee, 6LoWPAN, Thread, SNAP etc. Zigbee was first drafted 2004 and has become famous for being used in smart home implementations. It communicates at the 2.4GHz bandwidth, which is same as WiFi. Depending on environment Zigbee operates at 75

## III. THE CHALLENGES OF SMART HOME NETWORKING

## IV. WHY COMBINE MQTT, ZIGBEE, AND LORA?

LorAWAN 1.

## V. DESIGNING THE NETWORK ARCHITECTURE

## VI. PRACTICAL USE CASES

## VII. FUTURE TRENDS AND INNOVATIONS

## VIII. CONCLUSION