

# SMC-105: Managing Wireless Infrastructure in a Smart City

Owen Troy

Segment Marketing Manager



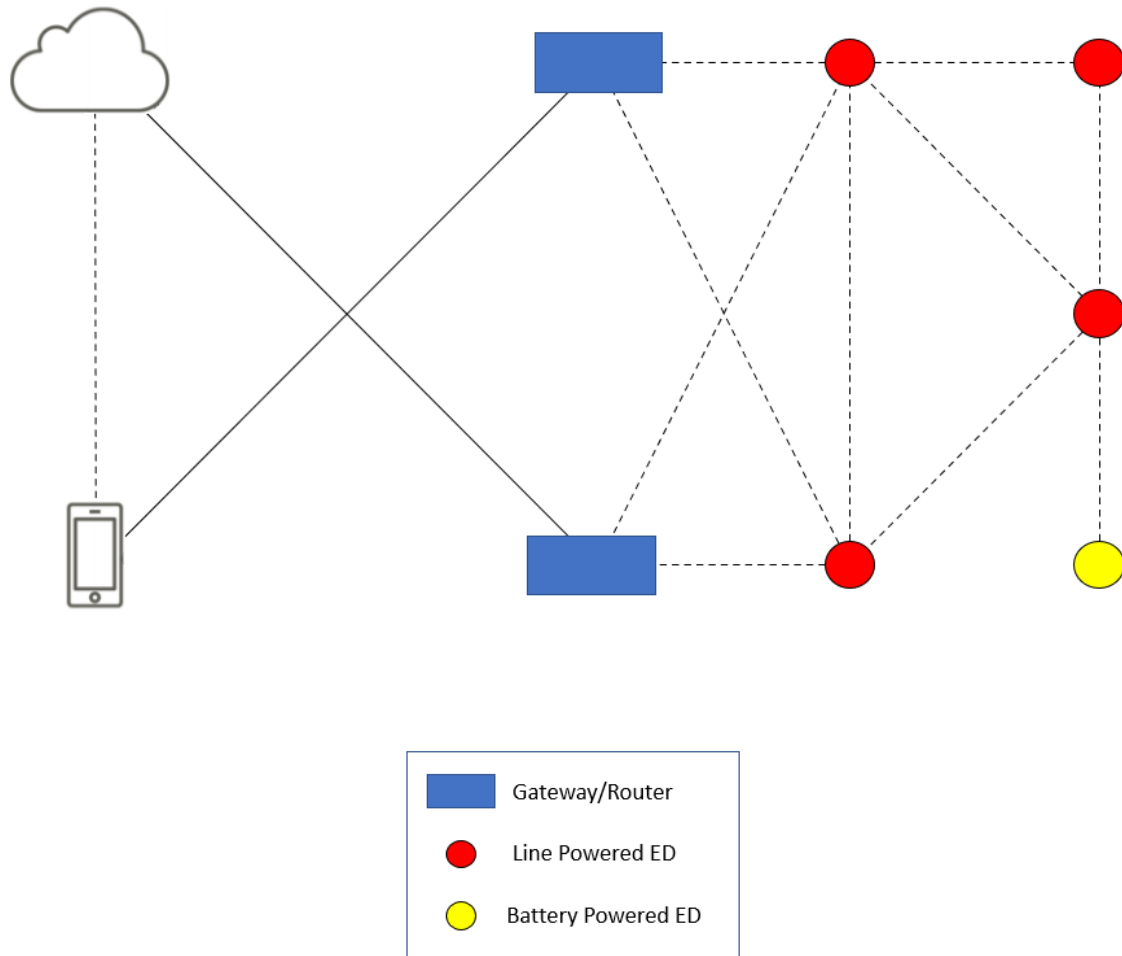


# IoT Wireless Infrastructure



- **Gateway, Router, Access Point, Hub, Bridge ...**
  - Ex. Wi-Fi Enterprise Access Point
  - Ex. Wi-SUN Border Router
  - Ex. LoraWAN Gateway
  - Ex. Sigfox Base Station
- **Connectivity to/from LAN, CAN, FAN, etc.**
- **The goal is ubiquity**
- **The driver is the ability to leverage an Infrastructure investment and provide additional services and value**

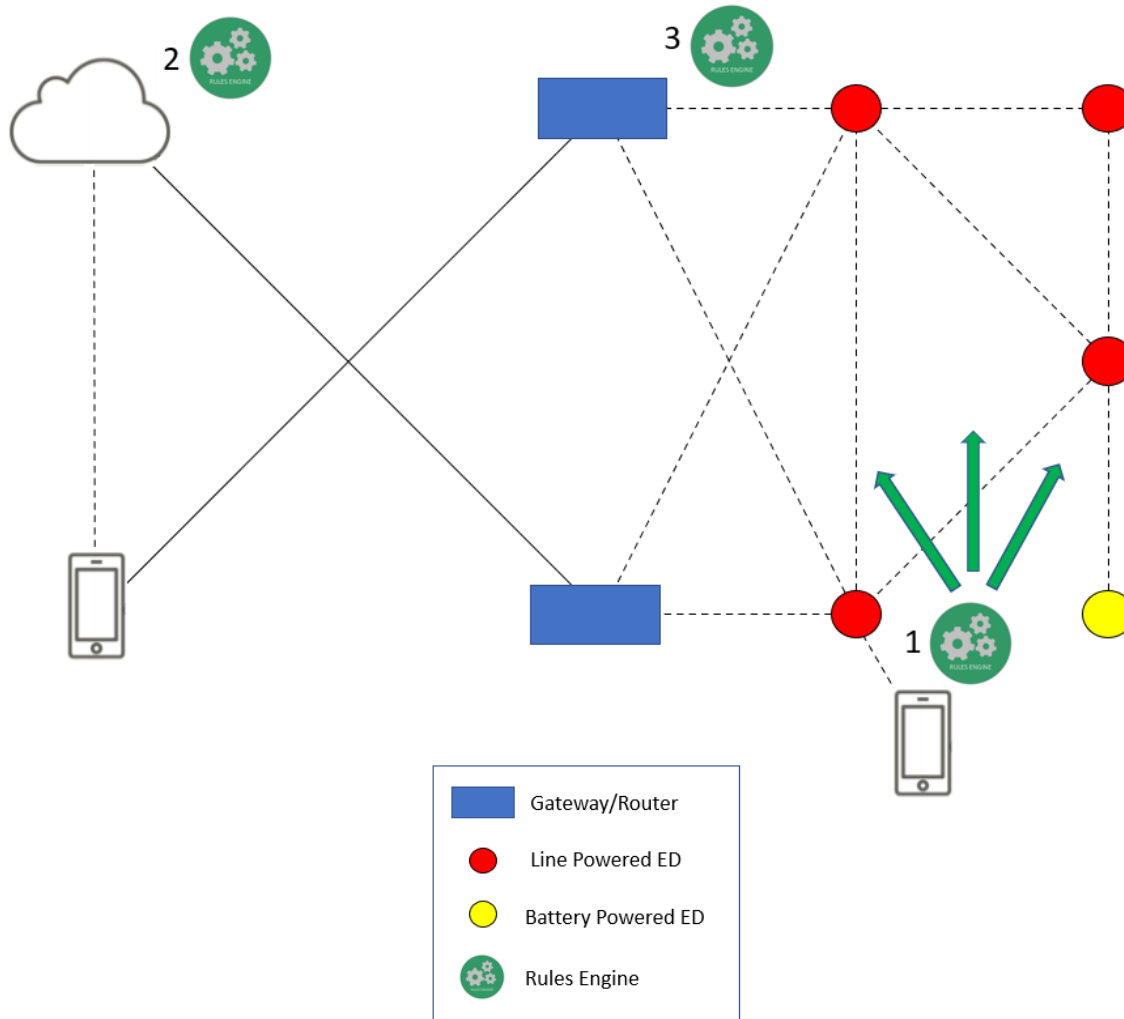
# IoT Wireless Solution



The combination of the Application and the underlying Network Protocol(s) define the following ...

- **Topology**
- **Performance**
  - Number of Devices
  - Throughput / Latency
  - End Device Power Efficiency
- **Robustness/Reliability**
- **Commissioning Model**
- **Security Model**
- **Data Model**

# IoT Wireless Rules Engine



## 1. Distributed Rules Engine

- With Router – Commissioning/Monitoring
- Without Router – Commissioning
- “Thin” – Border Router
- Limitation – Homogeneous network required

## 2. Cloud Based (Remote) Rules Engine

- Integrates with cloud-based inputs/outputs
- Persistent
- “Thin” – Border Router
- Limitation – Outage if lose connectivity
- Limitation – Latency

## 3. Local Rules Engine

- On Gateway or Local Server
- Driven by non-IP based protocols
- Driven by the “3 Laws”

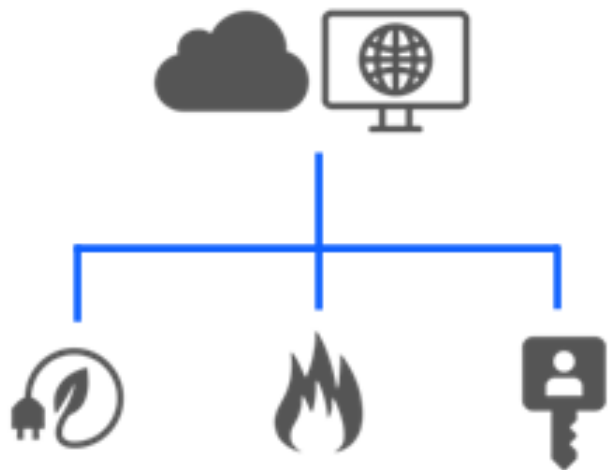




## Enterprise Verticals / Applications

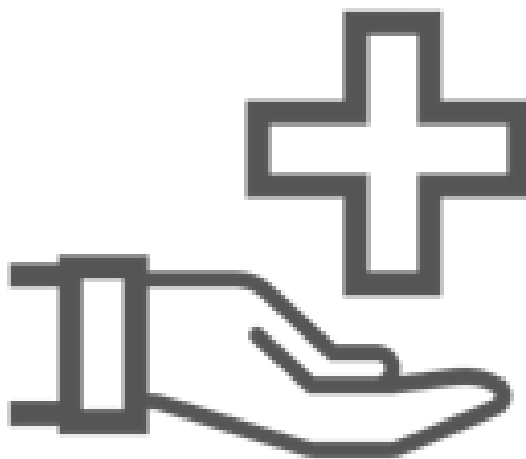
- Smart Building
- Retail
- Campus
  - Business
  - Education
- Hospitality
- Healthcare
- Government

# Building Automation Trends



## SIMPLIFICATION

- Wireless
- Trending towards IP (IPv6)
- Unification & Standards (IP-BLiS, Matter)
- Faster, easier provisioning (wireless)



## NEW VALUE ADD SERVICES

- Mobile installation tools
- Multi-protocol
- Asset tracking, Indoor Nav, DF
- Local intelligence with embedded AI/ML



## ELEVATED SECURITY

- Beyond encrypted data & comms
- Elevated need for trusted HW & SW
- Combat counterfeits and tampering
- Regulations and Standardized benchmarks (ICA, IEC 62443)



An aerial night view of a city, likely Dubai, with a dense urban landscape and a body of water in the background. Overlaid on the city is a glowing blue digital network of lines and nodes, representing smart city infrastructure. The sky is a deep blue, and the city lights are visible against the dark background.

## Smart City Verticals / Applications

- Energy Production
- Utility Monitoring & Control
- Municipal Infrastructure
  - Street Lighting
  - Traffic Control / Lights
  - Environmental Monitoring
  - Waste Management
- Agriculture

# Smart City Infrastructure Themes



## SCALE

- 1000s of devices
- Environmental sensors
- Application specific
- Endpoints – “one to many”



## COMMISSIONING

- Consistent across devices
- Map virtual to physical
- Professional - Commissioning tool
- Pre-commissioned



## SECURITY

- Encrypted data and communications
- Device authentication
- Secure Boot
- Regulatory drivers

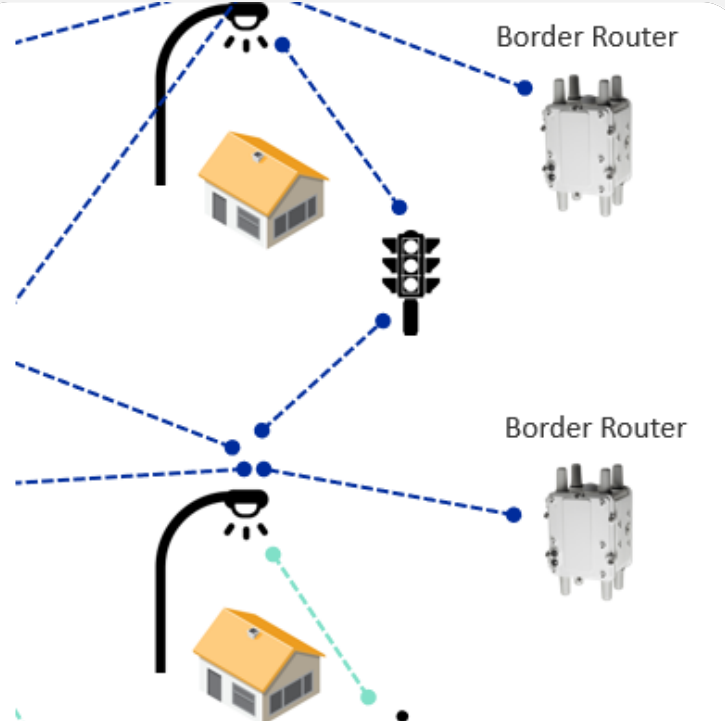


# Smart City Infrastructure Themes (cont.)



## QUALITY

- High availability of services
- Long qualification cycles
- End Device quality impacted
- Future proofing



## RELIABILITY

- PHY/MAC and network capabilities
- No "Single point of failure"
- Ecosystem - interoperability
- End Device certification program



## IN-FIELD DIAGNOSTICS

- Beyond development
- Protocol diagnostics / tables
- Network capture
- Source of recurring revenue

# Case Study: London Wi-SUN Deployment



## Wi-SUN technology provides the platform for City of London Smart City Initiative



- **Control Management System (CMS)**
  - Street lighting
  - Utilities
  - Parking
- **15,000** connected Wi-SUN devices
- **12 Wi-SUN border routers**
- **Major benefits**
  - Enables **real-time** remote management
  - Reduces electrical energy usage
  - **Automatically** generates maintenance service orders
  - **Future proof** system that can scale as the city converts old infrastructure to new

<https://wi-sun.org/blog/wi-sun-technology-provides-the-platform-for-city-of-london-smart-city-initiative/>



# Smart City Infrastructure Application Value Add



- Robust and reliable protocol “plumbing” provides a platform on which Application layer services can be developed to innovate, differentiate, and provide solutions to difficult problems
- User Interface
- Rules Engine
- AI/ML at the Edge
- End Device database / device shadowing
- Gateway replacement / backup & restore
- Diagnostics / logging interface
- End Device OTA update management
- Multi-gateway, back-end communications
- Multi-protocol groups & scenes
- Infrastructure management



works with  
BY SILICON LABS

VIRTUAL CONFERENCE

September 14–15, 2021

<https://workswith.silabs.com/>

## IoT Infrastructure sessions

### Session ID

### Session Name

GWY-101	Insights on SW/HW for Connecting IoT Products to the Cloud
GWY-201	Gateway Software Architecture – Hosting Diverse Protocols and Apps
SMC-103	Smart City Network Management in the Cloud Using Pelion
CLD-201	Secure Firmware Update for IoT Devices

## Also don't miss these sessions on discussed topics

### Session ID

### Session Name

SMC-101	Introducing the Smart City
SEC-101	Security Regulation and How it will Drive Innovation in IoT
WIR-102	Commissioning IoT Applications in Homes and Buildings
EML-101	Benefits of Enabling Artificial Intelligence & Machine Learning on the Edge
LPW-101	What Options Do I Have for LPWAN Applications?



Multiprotocol



Proprietary  
100s of Technologies

THREAD



works with



SILICON LABS





# works with

BY SILICON LABS

---

VIRTUAL CONFERENCE

