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How IoT is helping cities become more sustainable

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What makes a city smart?

Utility Monitoring and Control

- **Electric meters**
- **Water meters**
- **Gas meters**

Municipal Infrastructure

- **Street lighting**
- **Traffic lights**
- **Weather stations**
- **Environmental sensors**
- **Parking**

Energy production

- **Microgrids**
- **Renewables**
- **Electric vehicle equipment**

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Smart Water Distribution - Minimizing Losses and Improving Efficiency
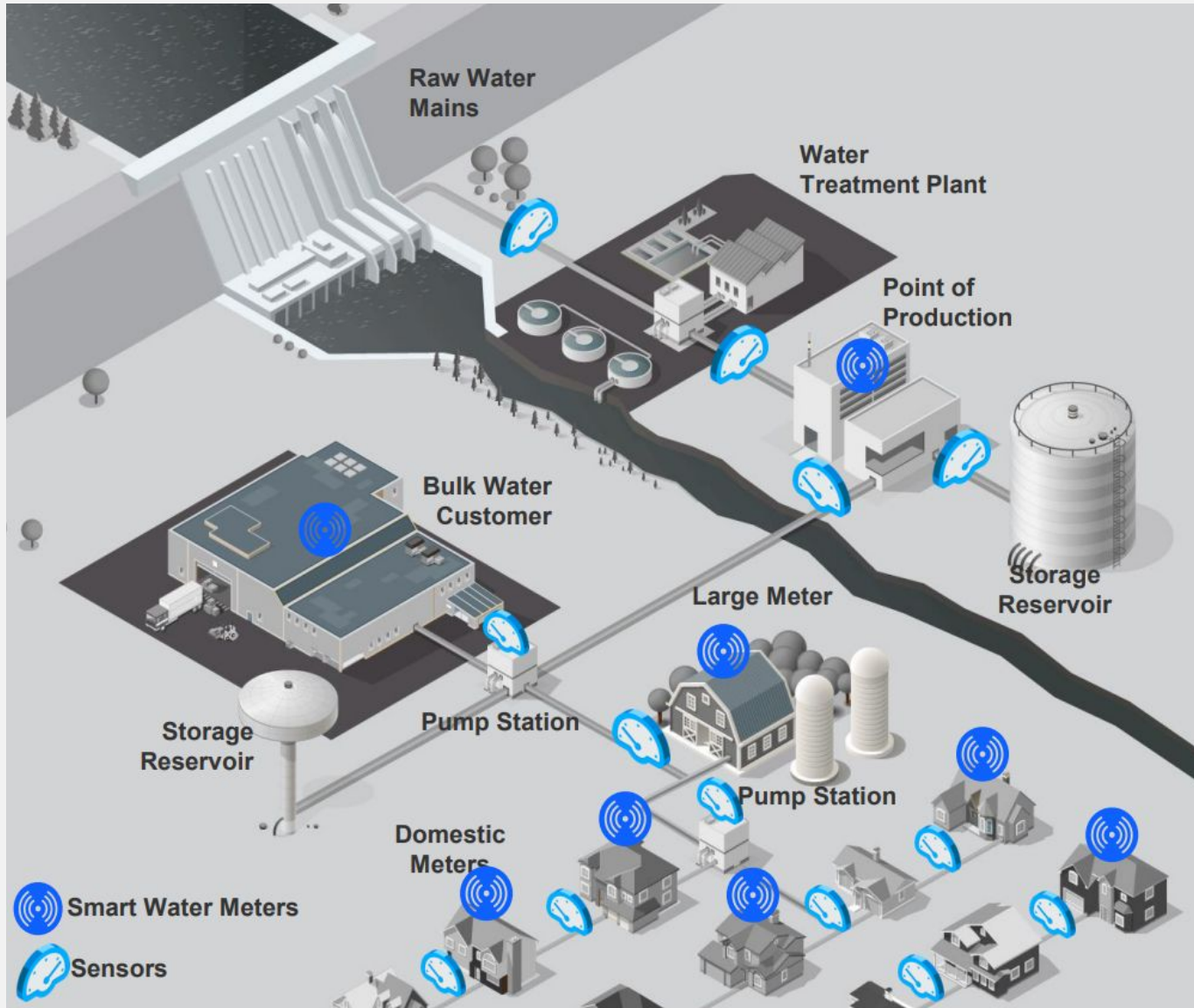
- Water is a critical and valuable resource
- Water leaks and thieving -> huge financial impact
  - As much as 40% is "non-billable"
- Leaks raise electric usage at pump stations
- Smart Meters improve water management
- Sensors across the network improve efficiency

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Long-Range IoT Protocols vs Mesh Networks
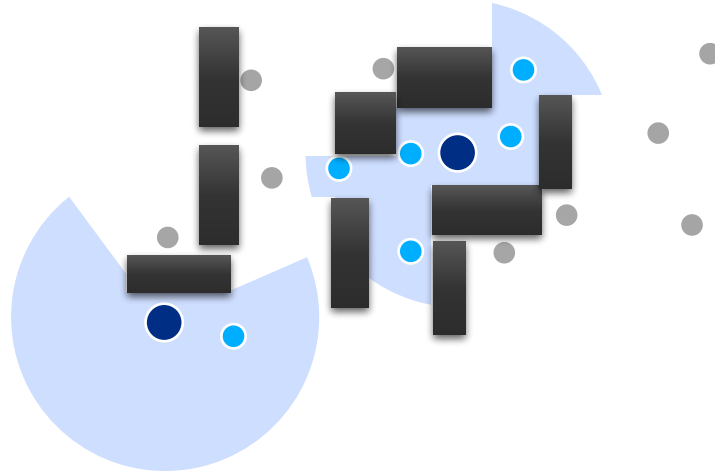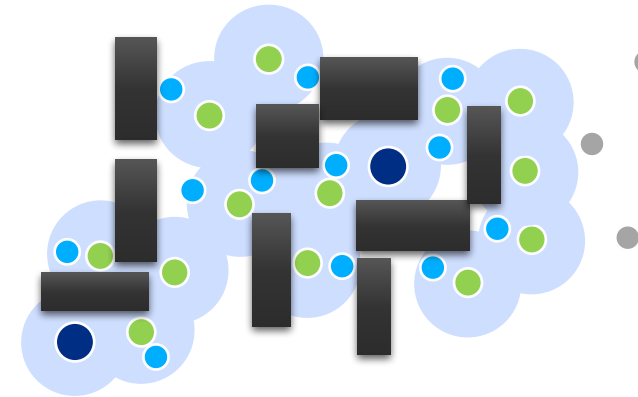

Legend (left): Building · Base station · Covered devices · Isolated devices · Base station RF range

LONG-RANGE IOT PROTOCOL

Star topology includes expensive base stations (LoRa, Sigfox, NB-IoT…)

In an urban environment or RF challenging layout, deploying enough base stations to cover the entirety of an area is tedious.

Legend (right): Building · Base station · Covered devices · Mesh router · Isolated devices · Base station RF range
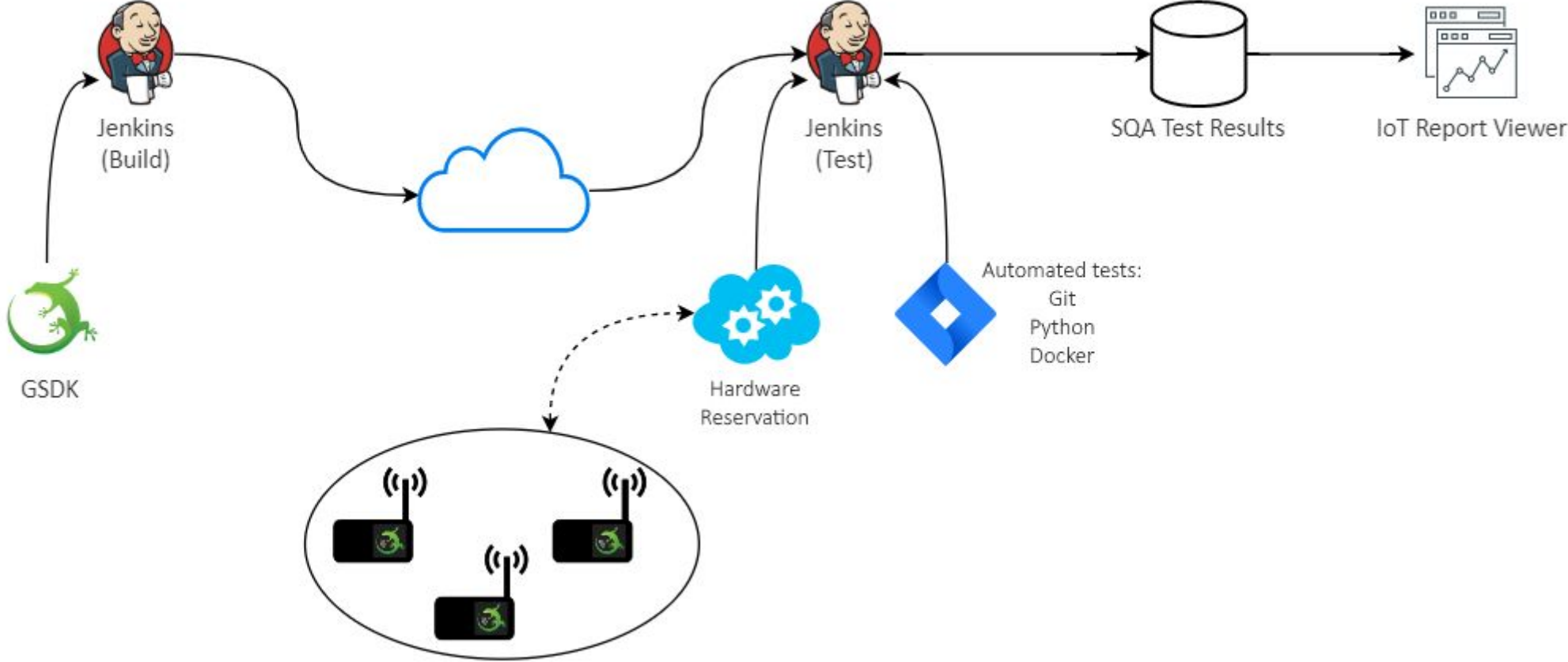
MESH NETWORK PROTOCOL

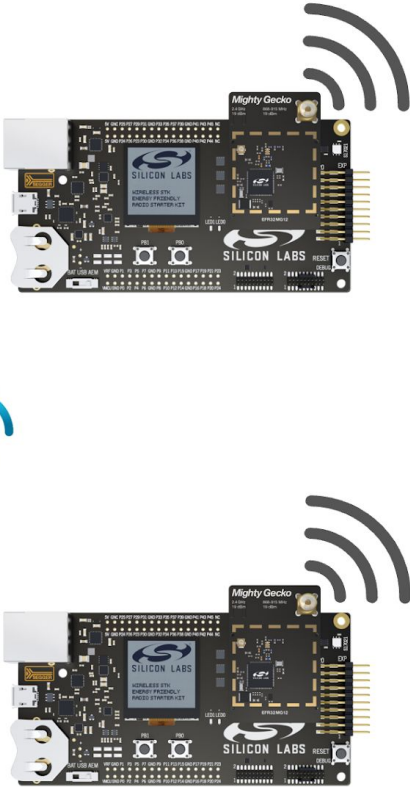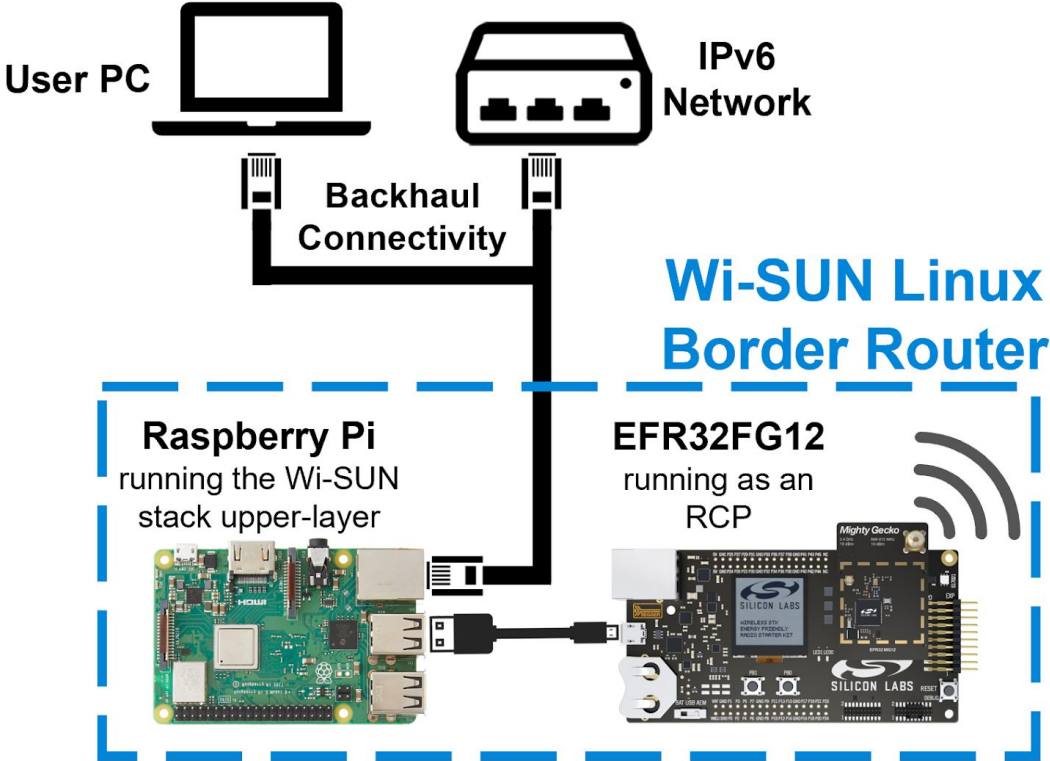**Mesh topology is more flexible (Wi-SUN/Thread/Bluetooth Mesh…)**

The device range is around 700-800m in the lowest data rate (50 Kbps FSK)

Having a complete RF coverage of such an area becomes possible
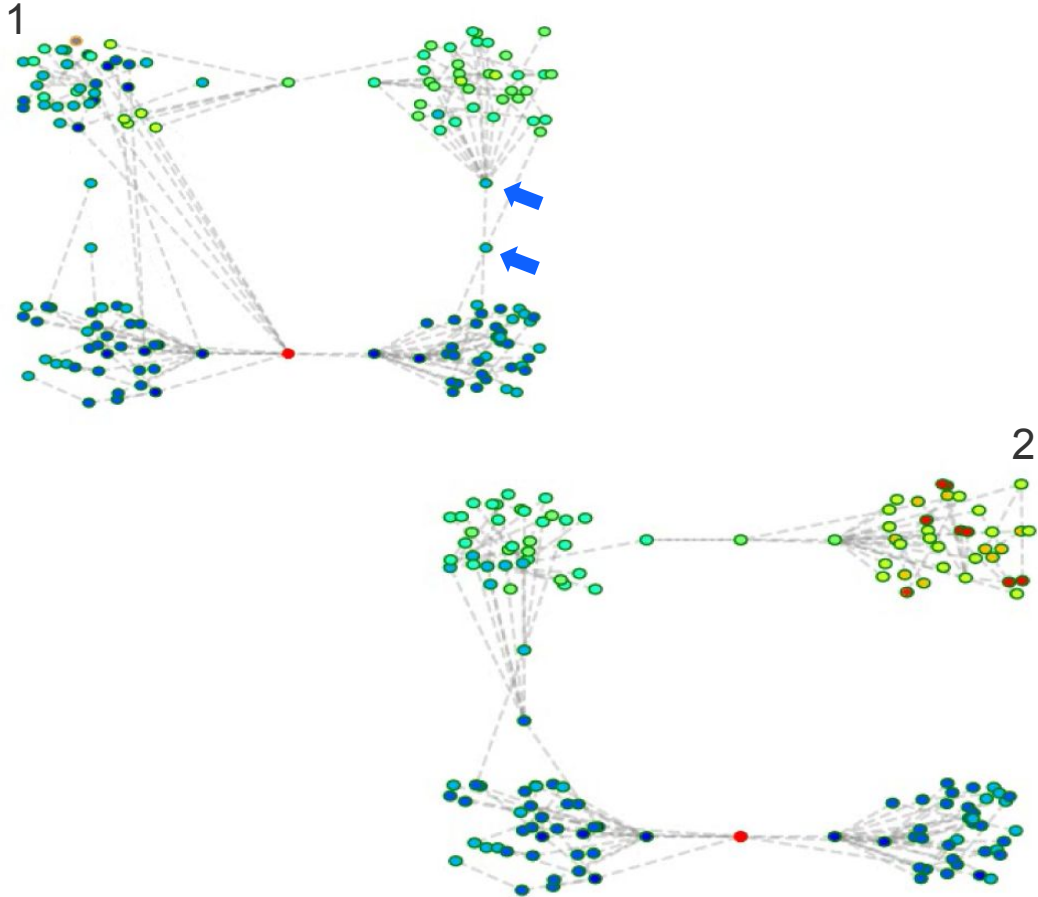
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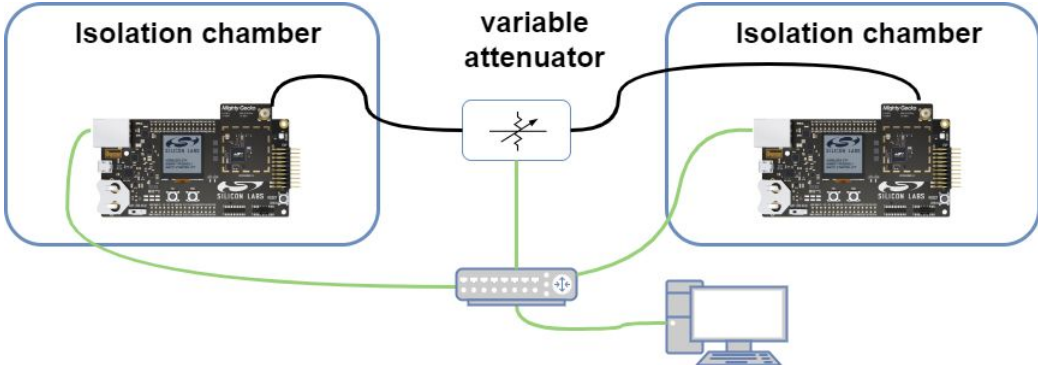# Wi-Sun testing

Test automation - networks

Test automation challenges

Self-healing

Simulating distance

Thank you

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