2017 NSF CYBER-PHYSICAL SYSTEMS PRINCIPAL INVESTIGATORS' MEETING

# Creating a Community Infrastructure for Interoperable Emergency Connectivity

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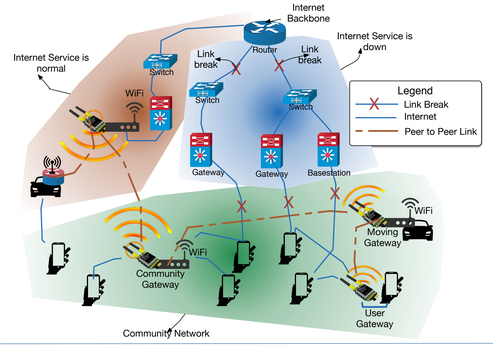
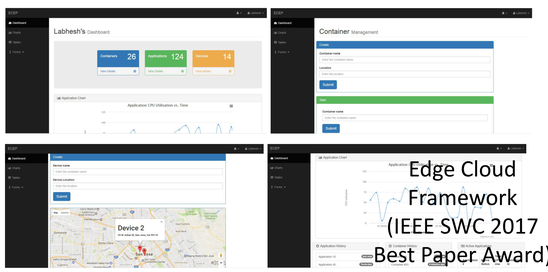
## Challenge:

- A disaster area might lose its connection to emergency response assets.
- Regional and national Emergency network backbones do not cover the local communities.
- Interoperable problems of existing IoT and connectivity frameworks.

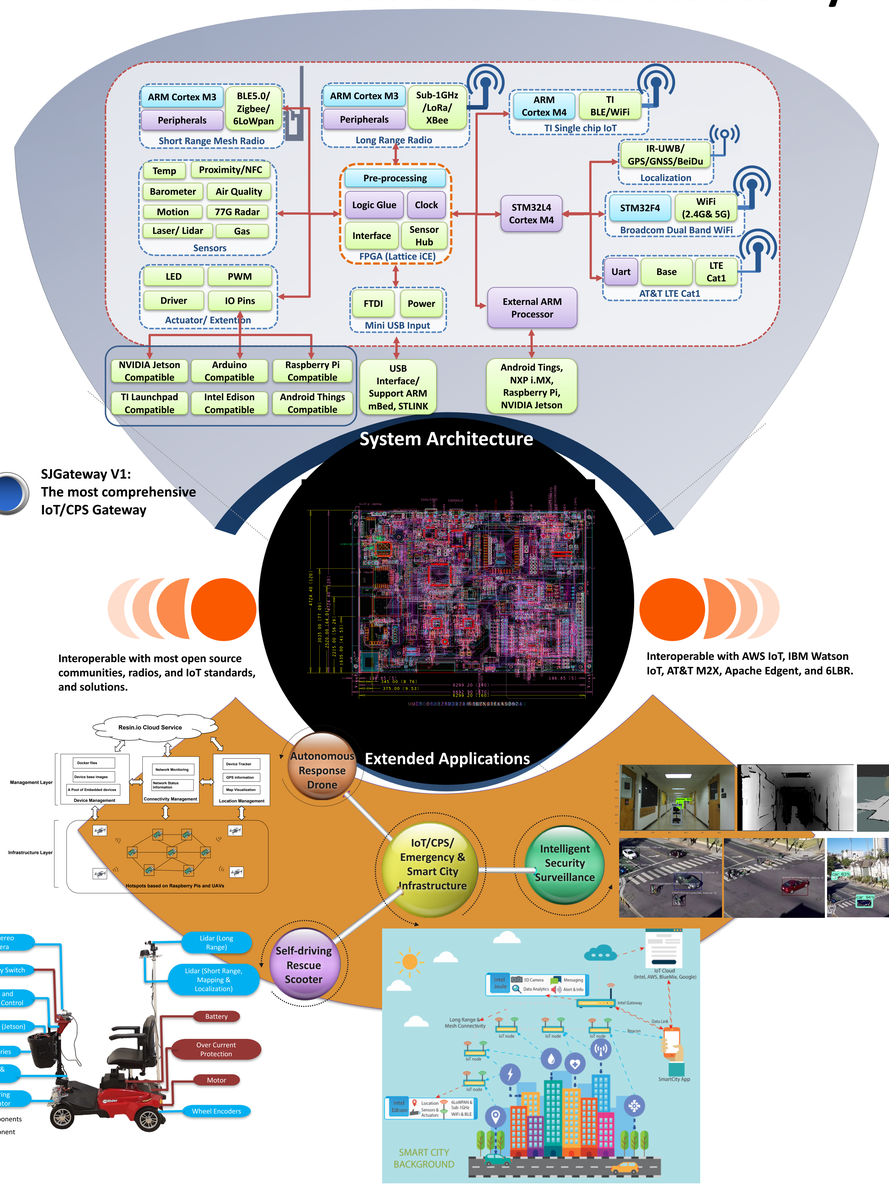



## Solution:

- Develop community gateways with multi-modal communication modules that enable *participatory communication* & *sensing*
- Deploy a cloud dashboard responsible for emergency notification, data collection, disaster assessment and evaluation
- Provide a seamless orchestration services to support large-scale automatic operations and management for edge devices
- A cloud-based cost-effective emergency network management system to provide dynamic network services.
- Dispatch the drones/scooters into the emergency zone and tracking device locations




Edge Cloud Framework (IEEE SWC 2017 Best Paper Award)

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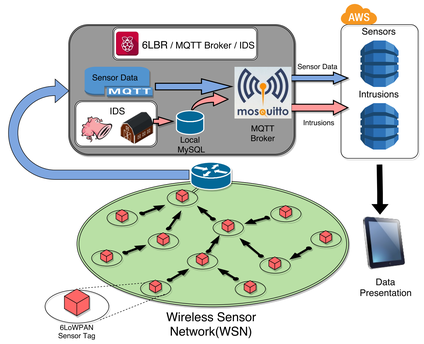
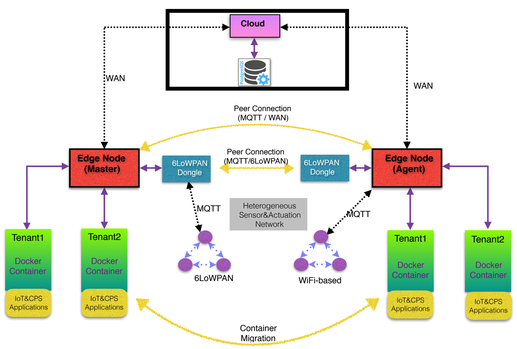
## Scientific Impact:

- New frameworks for Edge-based Secure Communication and Network Interoperability
- Resilient edge cloud for remote emergency Apps via peer-based container orchestration




## Broader Impact:

- Provide reliable connectivity and interoperable IoT services to neighborhoods within budget
- Help emergency responders to gain an accurate assessment of community conditions, prioritize emergency response demands and respond quickly
- Improve the emergency preparedness and response capability of individuals through developed App