

# **Broadband Public Safety Communication**

# Public Safety Communication

- Communication used by Law enforcement agencies, Fire Brigade, Medical Emergency teams etc.
  - Used for Public Safety & Disaster Recovery
- Unique Attributes
  - Critical Communication
    - Reliable, Resilient and Secure
  - Challenging Working environment
    - Robustness
  - Immediate connectivity and communication
    - No congestion/blocking
  - Group Communication
  - Direct mode (peer-to-peer) communication
  - Remote video surveillance, Real-time video communication
  - Positioning & Location

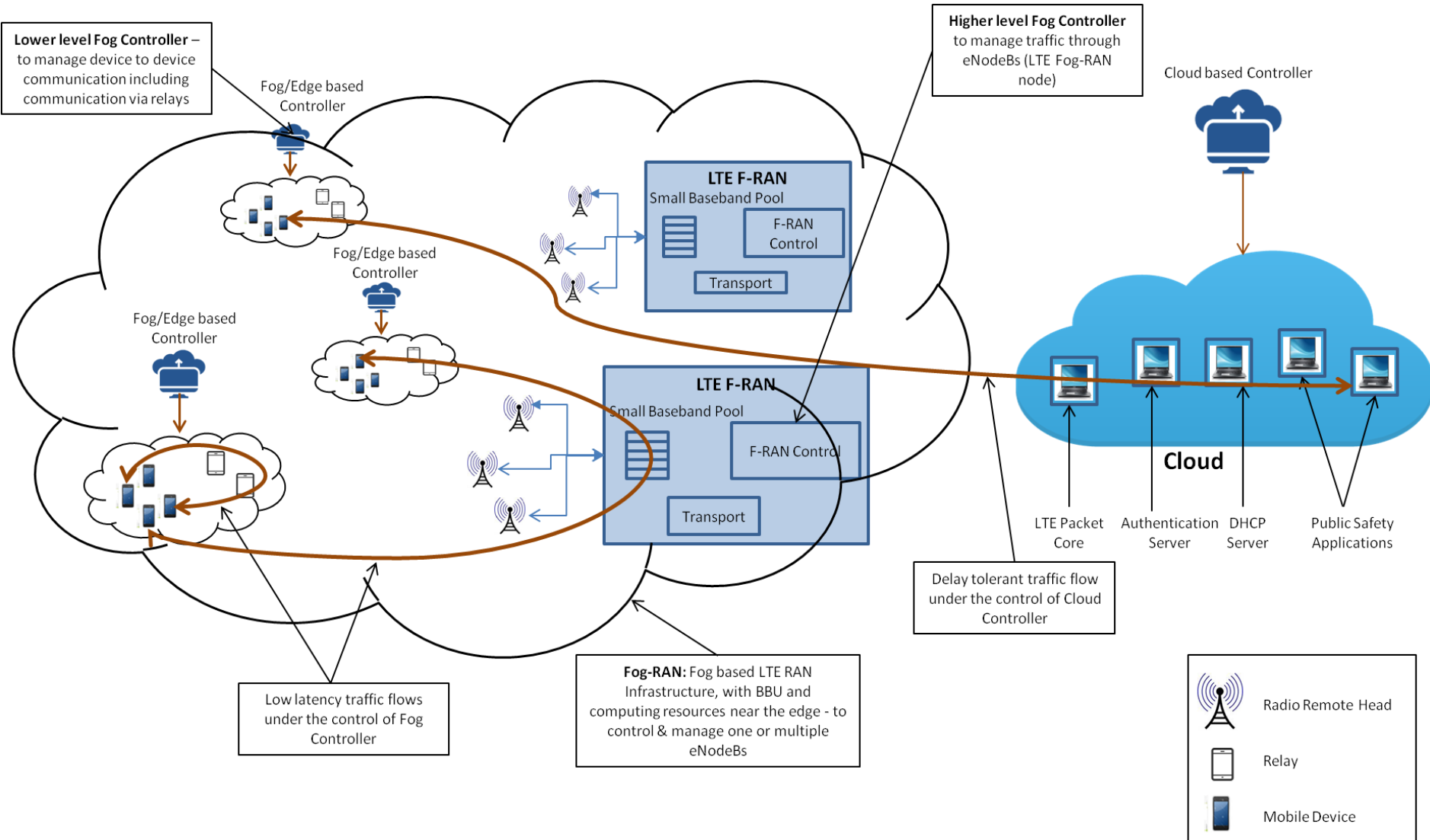
# Public Safety Communication Research@IIT Bombay

- To design and develop a high-speed broadband wireless communication system for public safety communication, supporting
  - Latest 3GPP LTE standards
  - Infrastructure communication (via backhaul/network)
  - Direct mode communication (Infrastructure-less communication)
    - Device-to-device communication
    - Communication via Relays
  - Real-time voice as well as Real-time data transfer including video transfer
  - Mission-Critical Applications, e.g., Group Call (Push-to-Talk)
  - Rapidly deployable system
    - Support for Isolated, standalone operation
  - Secure Communication between users

# Public Safety Communication Research@IIT Bombay

- Explore Fog/Edge and Cloud Based Architecture for Public Safety Communication System
  - Explore the efficacy of Fog Controllers in supporting
    - Low latency data flows
    - Immediate Connectivity and Communication within a group
  - Explore Cloud based SDN Controller
    - For management of Overlay Networks
    - Authentication of devices, to ensure secure communication
- Design of Overlay Networks for Public Safety Communication
  - Explore usage of SDN paradigm to control & manage the overlay network
- Develop highly available and resilient network architectures for Rapidly Deployable Public Safety Communication system
- Usage of SDN Paradigm for LTE based Network-in-a-Box solution for Rapidly Deployable Public Safety Communication system

# Public Safety Communication Research@IIT Bombay - Fog & Cloud based Architecture



# Public Safety Communication Research@IIT Bombay - Highly Available and Resilient Network Architecture

- Development of a highly available and resilient network architecture for Rapidly Deployable Public Safety Communication system
- Utilizing LTE Wireless link as the backhaul (self-backhaul)
- Development of an SDN based LTE Network in-a-box (NIB) architecture
- Exploring the usage of a movable vehicle, e.g., an Unmanned Aerial Vehicle(UAV) or a Terrestrial Vehicle as the LTE NIB platform

