SDN for the Smart City

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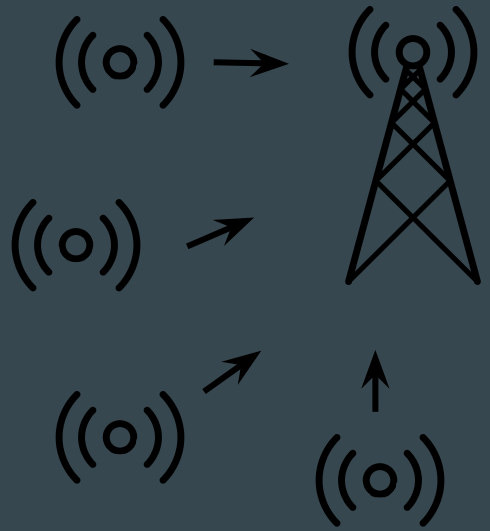
Smart Cities

- Lots of sensors - IoT
- Small, heterogeneous, low power
- Frequently embedded in infrastructure
- Many types
  - Cameras
  - Air quality sensors
  - Temperature probes
  - Etc.
- May include actuators



Analytics

- Logically centralized
- Aggregate and analyze data
- Offer value to residents & administrators
  - Traffic management
  - Crime detection & deterrence
  - Energy efficiency
- Goal is to understand and modify how the city is being used

Disaster Response & Recovery

- Many high-impact natural disasters
- Plan & manage evacuation
- Optimize routes for first responders
- Gather detailed info about state of city
- Find and coordinate with citizens
- Actuate devices in response

Problem

- Highly dependent on network
  - Severely susceptible to damage or attack
- Massive amounts of data generated
- Expensive and time consuming to setup and maintain
- SDNs can help with these

SDN for resilient and efficient IoT

- Resilience
  - Can reconfigure network quickly in response to damage
    - Precompute disjoint backup paths through network
    - Recompute others on-the-fly
    - Redundant network connections
  - Can help isolate and secure data
- Efficiency
  - Can balance load from network
  - Reduce operating and IT costs

Research Questions

- How can we quickly and reliably reconnect the most critical devices?
- How can we configure the network to best support first responders?
- How can we scale the network to deal with huge numbers of IoT devices?
- How can we provide access to the data while keeping it secure?