Section 4: Week 7: Smart Cities

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# Smart Cities

The Internet of Things (IoT) attempts to widen the interconnectivity of computers to include interconnectivity of objects (Commission of the European Communities, 2009). These objects expose sensors that can aggregate into personalized data feeds.

These objects can share a contextual domain, such as a home, warehouse, or city to form smart locations. As the scope of these smart locations grows, so does the number of user scenarios that can be enhanced.

Developers can harness that data emitted from those scenarios to make intelligent recommendations and provide guidance around optimizations and safety decisions. These capabilities delight the inhabitants and encourage them to interact with more objects, continuing the cycle.

## Problem Statement

On the surface, smart cities are relatively simple constructs; there are some devices, a bit of networking, data published into the cloud, and users interact with it through their mobile devices. Where it becomes complex is during the interactions of each of those core entities.

First, a mechanism for securely interacting with the environment is required. An identity is needed for each entity so that it can connect to the shared wireless network. That network needs to provide security assurances, which comes from Software Defined Networking (SDN) as it virtualizes the topology. Then authorization policies need to control the interactions between both user-to-device and device-to-device traffic.

Second, a mechanism for data discovery and data cataloging is required. If the developers cannot identify the schemas and data feeds, then apps will not be written to utilize them. These feeds will originate from heterogeneously provisioned environments (Balduccini, et al., 2018). Balduccini et al. describe a need for decomposing each *aspect* of the environment into

## Goals

## Relevance and Significance

# Literature Review

## Reasoning about Smart Cities (2018)

Balduccini

# Approach