Architecture

A discussion, not a deck

IoT architectures

Mesh-of-things--things talk to other things, without intermediaries.

Thing-hub-cloud --things talk to a hub, which talks back to them and to the cloud. There's a spectrum of emphasis on the hub vs. the cloud. In some the hub is simply an access point; in others it's a critical place for control loops and ALGs.

Meta Thing--some things are actually virtual, like an alarm composed of clock, lights, and thermostat.

Nearby things--some things may be geospatially related even if they are not on the same network or within the same administrative domain.

Because we're not building a closed system, all of these will come true.

Sometimes all at once.

Sometimes all at twice.

- The same physical thing may be exposed in different ecosystems in different ways.
  - It might be exposed as a single monolithic thing in one ecosystem
  - It may be decomposed into multiple sensors/actuators/control points in another

- Similarly, one system may expose multiple independent properties, where a different ecosystem would expose a single composed property.

What's the implication for semantic interoperability?

- We need to understand where data is created
- We need to understand where data is sent
- We need to know where actions can be taken
- We need to understand where control loops might be
- We need to understand where "bridges", "metamodels", or "gateways" might live as facilitators of communication among place where data is sent and control loops live
- We need to understand who might listen to whom to know what the security properties needed for communication are.
- We need to recognize that the development of new applications for deployed devices may change where data is sent or control loops live

What are the simplest building blocks we can use?

Sure, there's LEGO Star Wars, LEGO Dr. Who, and even LEGO Ghostbusters. But starting here, in the classic case, what are the simplest building blocks that get us the set of architectures we need to build?