Semantic Interoperability POC

Milan Milenkovic, Principal, IoTsense
www.iotsense.com

July, 2017
Semantic Interoperability POC

- IoT standards: competing, fragmented, overlapping, legacy…
  - and proprietary, legacy systems still generating useful data
- (just in case) not one to rule them all...
- Next best thing: semantic interoperability for services, apps

Interop POC
- Gateways report sensor data in different formats: IPSO, OCF, Haystack, *
- Convert to interoperable format
- Test feasibility, complexity
- Inform interoperability work, expand to industry [IIC, OFog] test-beds?
Interop POC Architecture

- Common sensors (few)
- Data in different stds
- Converted in flight to interop format

IoTsense
POC Components
Some learnings and thoughts

• The nice thing about [IoT] standards: so many to choose from, you can pick the one you like…

• Hard to navigate, understand, and apply

• (many) missing explicit scope, e.g. “we want to enable:
  • data aggregation from disparate domains, for portable apps and services like analytics, ML, AI or
  • compliant devices [from different manufacturers] to talk to each other, form groups and assemblies, exchange data and control, or
  • heterogeneous devices to be controlled by portable, third-party services
  • …”

• (many) missing explicit statement of environmental assumptions and dependencies, if any:
  • what needs to be in place, data plane and/or control plane, discovery, provisioning, security, protocols if any, mode(s) of communication – pub/sub, posting…
Some learnings and thoughts, p2 of 2

- Rigid O-O data structuring may be harmful to application portability, data interoperability
  - Superfluous fields imposed for some end points
    - provide made-up values or fail compliance?
  - Inability to express source info
    - e.g. specification calls for Boolean, sensor supplies actual numerical reading
  - Time stamp essential for data reporting, not part of many stds?

- Need to rethink handling of meta-data
  - Describe, not prescribe?
  - Orthogonal to data definition and reporting, separate?
  - Dedicated/customized APIs to retrieve?

- Conjectures
  - Minimalistic, flexible specs: allow apps and services to create their own internal object-model representations [...soapbox...]
Q&A

milan@iotsense.com