

Semantic Interoperability POC

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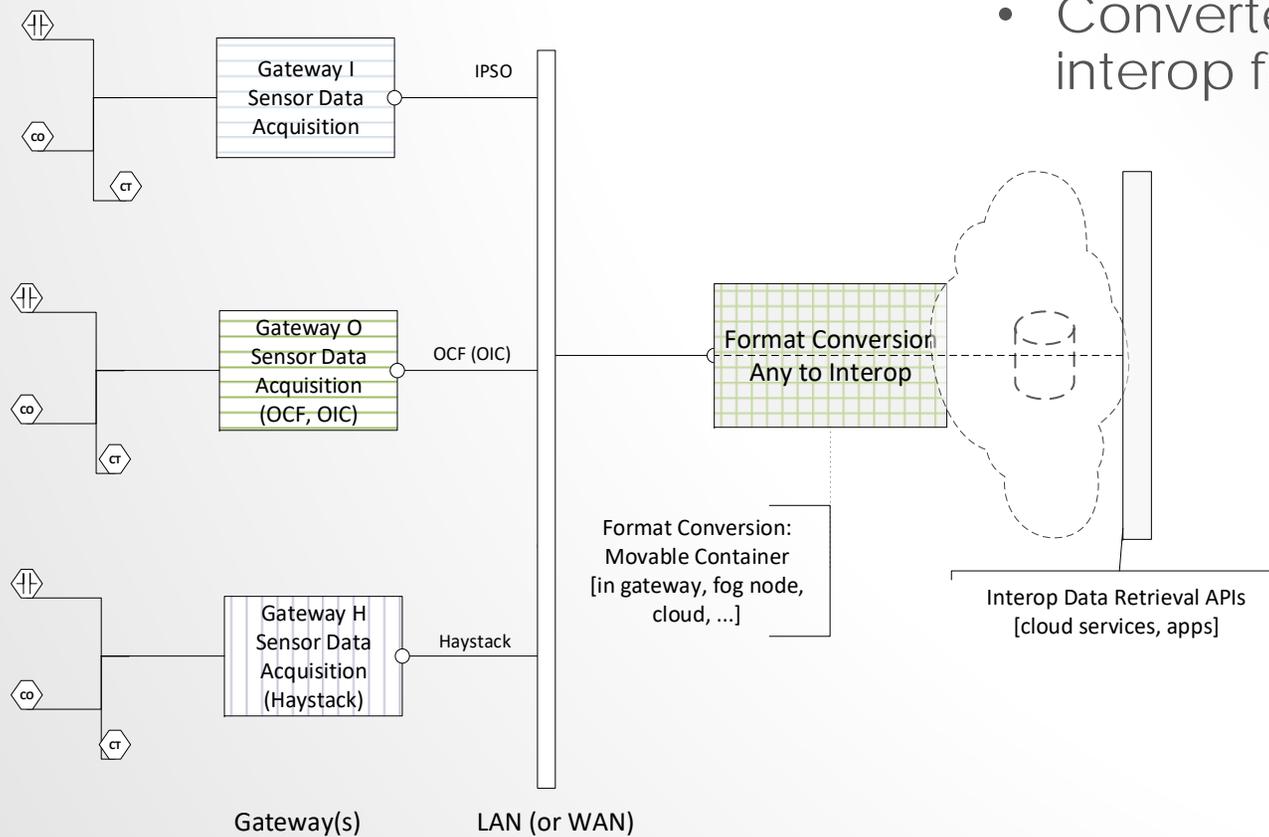
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Semantic Interoperability POC

- 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



POC Components



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POC UI



```
{  
  "id": "gipso/3303/1",  
  "value": "77.80",  
  "unit": "F",  
  "meta": [  
    "sensor",  
    "temperature"  
  ],  
  "time": "2017-05-05T09:56:40 UTC"  
}
```

Interop

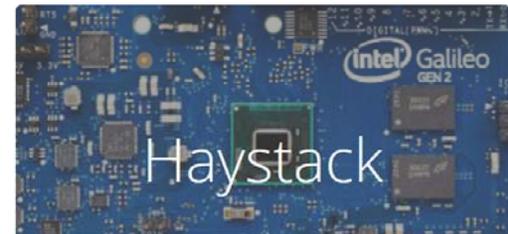
Pause/Resume animation



```
{  
  "bn": "gipso/3303/1",  
  "e": [  
    {  
      "n": "5700",  
      "v": "77.80"  
    },  
    {  
      "n": "5701",  
      "v": "F"  
    }  
  ],  
  "ns": "2017-05-05T18:56:40Z UTC"  
}
```



```
{  
  "id": "goof.lobby.ats",  
  "units": "F",  
  "temperature": "76.55",  
  "rt": [  
    "oic.r.temperature"  
  ],  
  "ns": "2017-05-05T18:56:46Z UTC"  
}
```



```
{  
  "id": "r:ghay.lobby.ats",  
  "unit": "F",  
  "curVal": "n:77.54",  
  "sensor": "m:",  
  "temp": "m:",  
  "air": "m:",  
  "DateTime": "t:2017-05-05T20:55:59+02:00 Paris"  
}
```

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

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