IoT.est
Internet of Things Environment for Service Creation and Testing

Smartness in the context of IoT technologies
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IoT.est – a quick reminder

• IoT.est is investigating and developing a test-driven service creation environment (SCE) for Internet of Things enabled business services.
• The IoT-SCE enables the acquisition of data and control/actuation features of sensors, objects and actuators.
• The project provides means and tools to define and instantiate IoT services that exploit data across domain boundaries and that have testing build in by design.
• IoT.est facilitates run-time monitoring and will enable autonomous service adaptation to environment/context and network parameter (e.g. QoS) changes.
Why do we need “smart” in the IoT?
But how does “smart” help us?
IoT.est: where do we need smartness?

- IoT enabled Business Services: Machine interpretable (semantic) descriptions
- Service Composition: A Knowledge based approach
- Service Components: Re-usable, interoperable and adaptive
- Abstraction: Mapping to heterogeneous platforms and large scale deployment
- Testing (Design Time): Automated generation of tests
- Monitoring (Run-Time): Context-aware service adaptation

- This requires: *machine interpretable description* + interoperable domain knowledge + *automated discovery and composition, reasoning and decision making*
Smartness in the IoT requires common models

- **Service model**
  - IoT.est service model, IoT-A service model, OWL-S

- **Entity and resource models**
  - IoT models, W3C SSN

- **Test models and Test component descriptions**

- **Common models and knowledge-based to describe the domain knowledge**
  - Linked Sensor (IoT) data approach
Approach and Mechanisms for semantic modeling

• Linked data approach
  – using URI’s as names for things;
  – using HTTP URI’s to look up those names;
  – providing useful RDF information related to URI’s
  – including RDF statements that link to other URI’s

• Access and discovery mechanisms and interfaces
  – Logical reasoning and querying large scale data

• Ontology alignment and ontology mapping
  – Semi-automated and manual alignment
  – Developing alignment and enhancement tools
Languages (formal/non-formal)
Technologies (toolkits, SW tools)
Protocols enabling semantic interoperability

• RDF/OWL representations
  – Also investigating alternative representation and reasoning mechanisms for constrained environments (e.g. Binary RDF, IETF approach)

• Ontology design tools
  – Protégé

• Common Interface and access end-points
  – Standard interface and service models

• Ontology mapping and alignment
  – Ontology engineering phase
  – Automated tools
IoT.est project: Internet of Things Environment for Service Creation and Testing

http://ict-iotest.eu/