The Linked Data Platform to Address, Describe and Interact with Things

Roger Menday
Neil Benn
Nishita Hathi

Fujitsu Laboratories of Europe, London

Billions of networked *things* need an infrastructure that allows these to be observed, linked as well as managed by many different consuming applications. An example of a thing is a temperature sensor; it is a simple sensor to be observed. Another example is a water sprinkler system that can support direct interaction too, e.g. turn on, turn off, and adjust water flow rate.

In order to manage a large amount of the things our first requirement is that **each thing has a unique and universal address by which it is known**. Furthermore, using a HTTP URL as an address has additional value. The HTTP scheme in the URL is important, and so are the REST principals in how the operations are interpreted and how the representations are used. The HTTP scheme indicates to the client that the resource will support some of the operations of the uniform interface.

HTTP GET is a very important operation and always available. The GET operation is a side-effect free request of the targeted resource that should respond with a description. We require that **a description use a universal format**. A universal format means that clients can assume a common meta-model of information representation and processing across all things. It does not mean that the client must be able to understand the all the vocabulary of the representation. The meta-model should include a common way for asserting properties of a thing and for referring to other things and labelling the nature of the reference.

After using HTTP GET to safely interrogate a thing the client requires a **mechanism such that a client can discover and interact with a thing**, e.g. a sprinkler can be switched-on. These can vary according to the state of the thing, e.g. a sprinkler can be turned off when it is in the 'on' state, but turned on when in the 'off' state. Thus a thing should be capable of advertising the possible interactions that it supports at the time of a request.

The combination of URLs, HTTP and Linked Data presents a data infrastructure for robot consumers, in the same way that URLs, HTTP and HTML is a document web for humans. The Linked Data Platform (LDP) standardisation activity specifies the technical details how robots can operate in this data environment. LDP targets the general RESTful read/write Linked Data. Using LDP in the Internet of Things scenario presents some specific challenges that may require specific extensions or future standardisation.