DNS-The glue in IoT

12/10/2014

Plan

- ✓ Identifiers in IoT
- ✓ The need for DNS in IoT – use cases
- ✓ DNS as the glue
- ✓ How we plan to use DNS in a IoT PoC?

Identifiers

Making the things identifiable

Current identifier structure

MAC Address - 00-15-C5-49-04-A95

- Blocks – assigned to vendors by the IEEE
- Adapters - assigned by the vendor from its block

IPv4 Address - 129.113.7.156

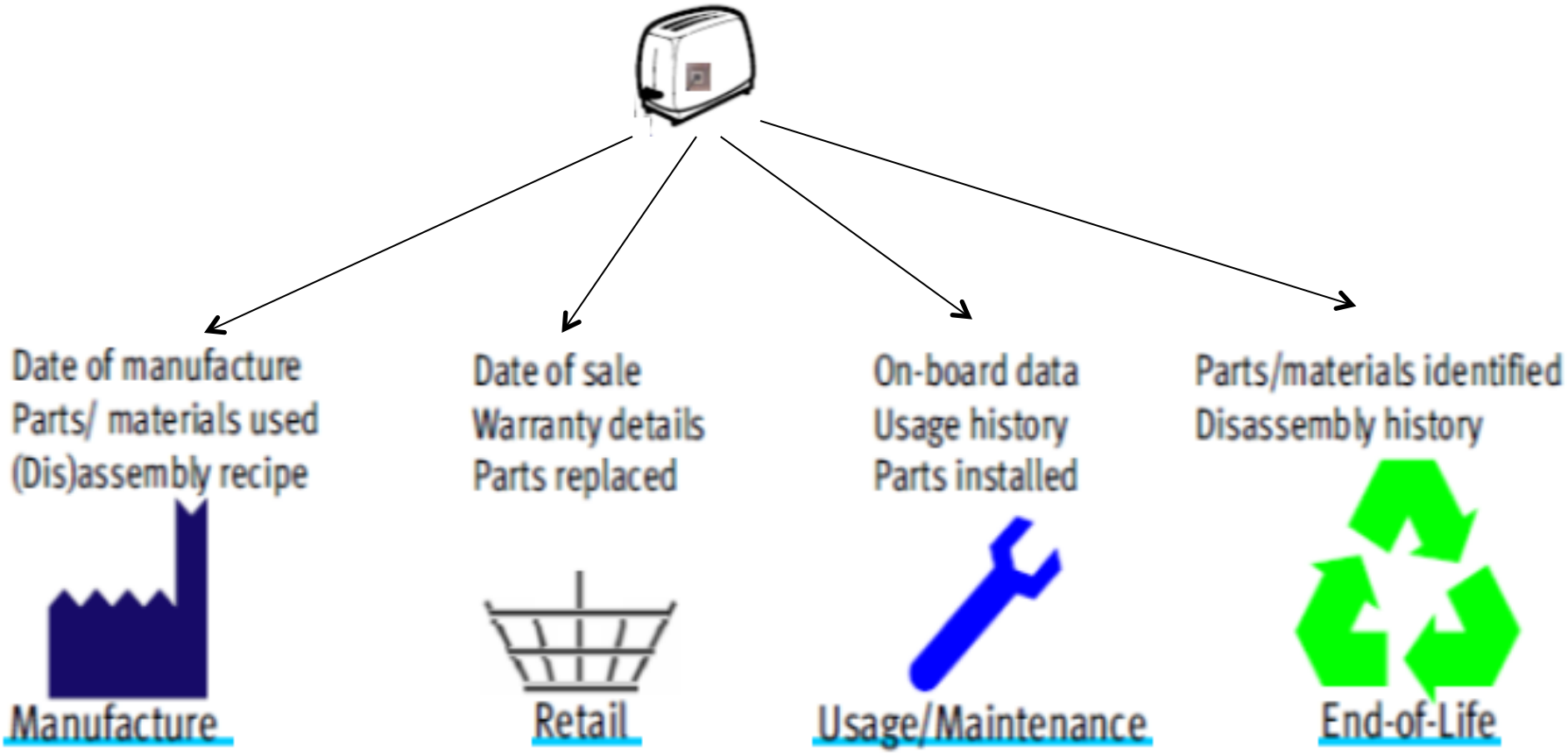
- Prefixes – IANA, RIRs, ISPs
- Hosts – Configured by the network administrator

Identifier structure in IoT

Header	Company Code	Product Code	Serial Number
8 bits	28 bits	24 bits	36 bits

The need for DNS - IoT use cases

B2B


Date of manufacture
Parts/ materials used
(Dis)assembly recipe
Manufacture
Date of sale
Warranty details
Parts replaced
Retail
On-board data
Usage history
Parts installed
Usage/Maintenance
Parts/materials identified
Disassembly history
End-of-Life

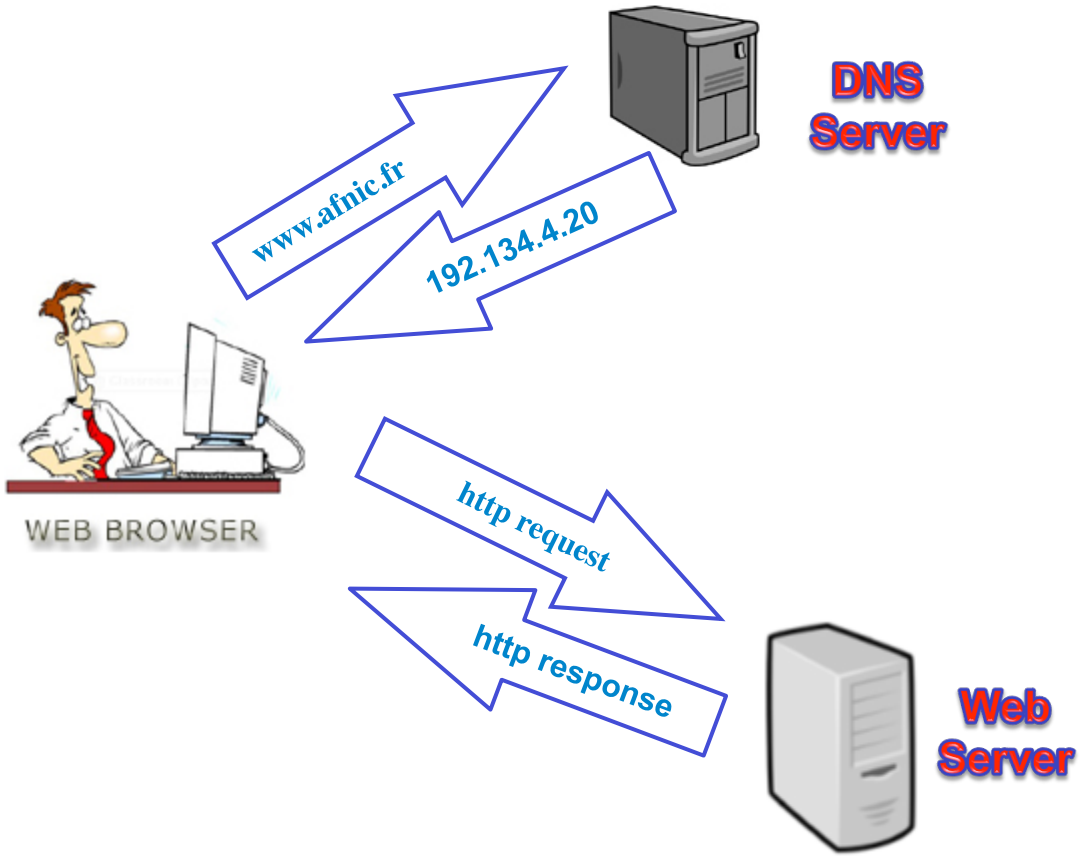
B2C

Extended Packaging Information

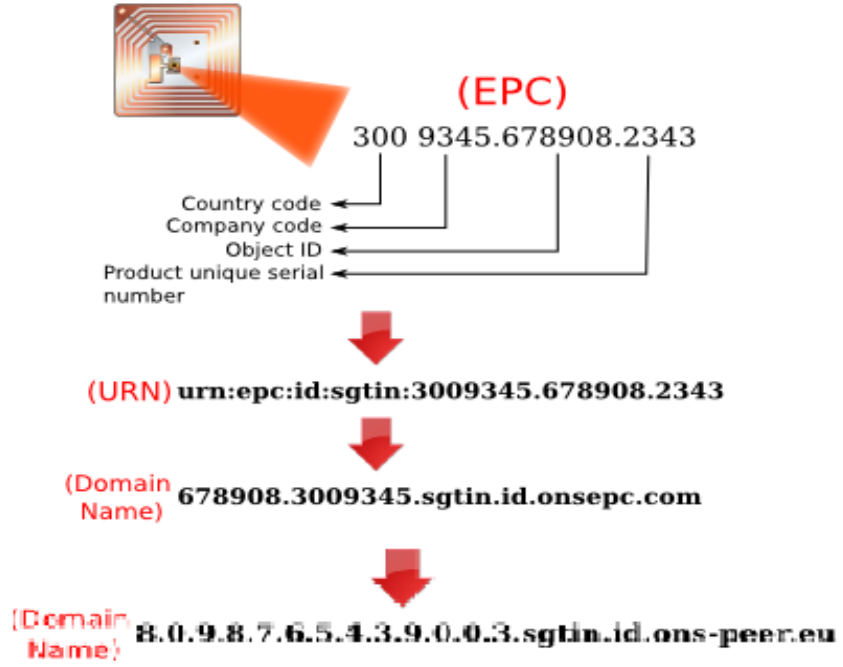
M2M

The 'glue' metaphor

DNS – The « glue » in Internet

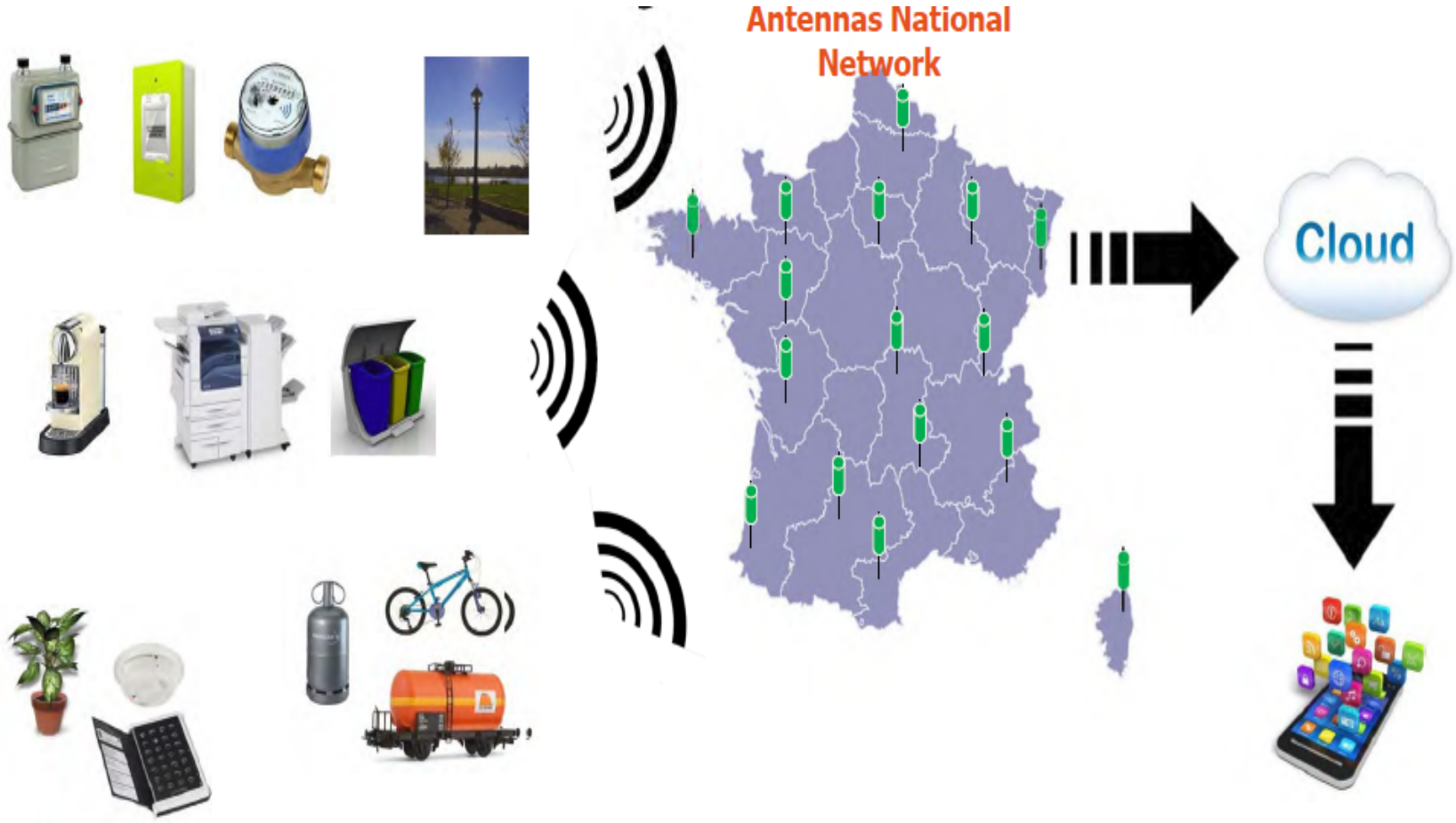


DNS – Could be the « glue » in IoT



The IoT PoC

IoT Long Range network



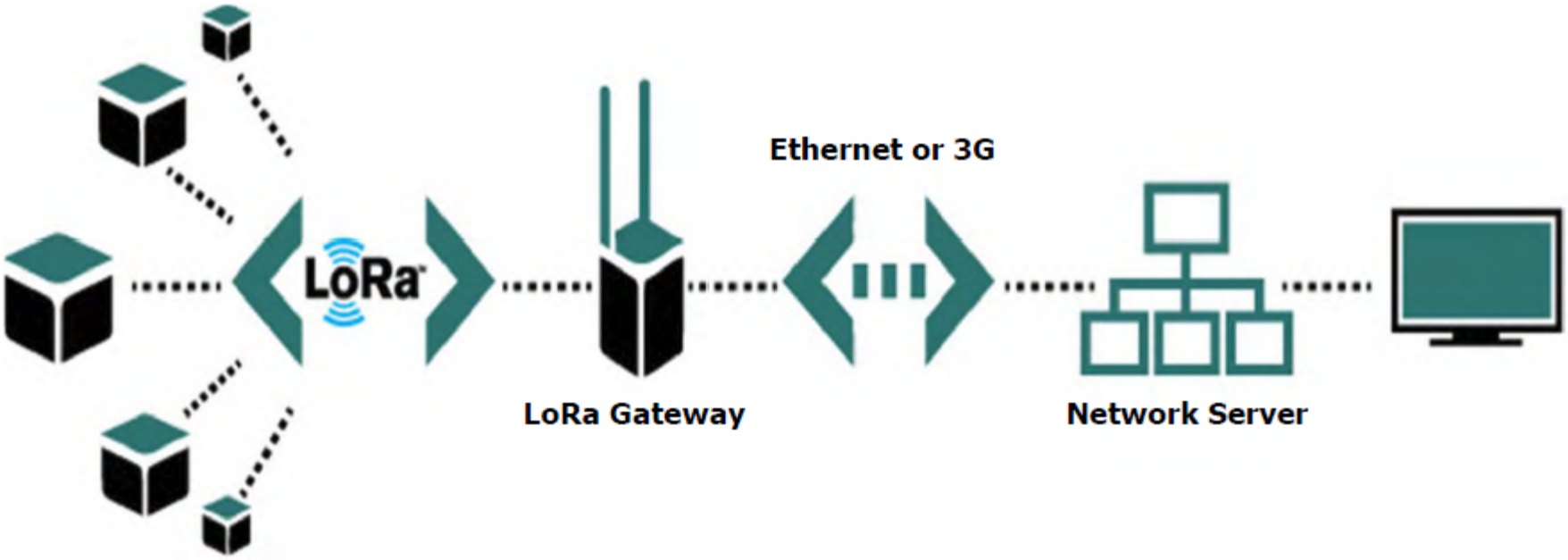
LoRA Antenna

- ✓ Range
  - ✓ 3 – 4 Km in cities
  - ✓ 15 km in country side
- ✓ Frequency – 868 Mhz
- ✓ Star topology
- ✓ Communication cost – very low

LoRa Feature

- ✓Similar to cellular network
- ✓But ultra brand low range
- ✓Directly connects to the device
- ✓No mesh networks needed

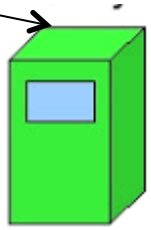
LoRa – Set up



Arduino shield

- ✓Add support to connect to objects
- ✓ Both radio and IP interface
- ✓Support narrowband range, 6lowpan, IPv6, CoAP
- ✓Contiki OS
- ✓ Proxy which helps to transform HTTP to COAP and vice versa

LoRa with Arduino shield support



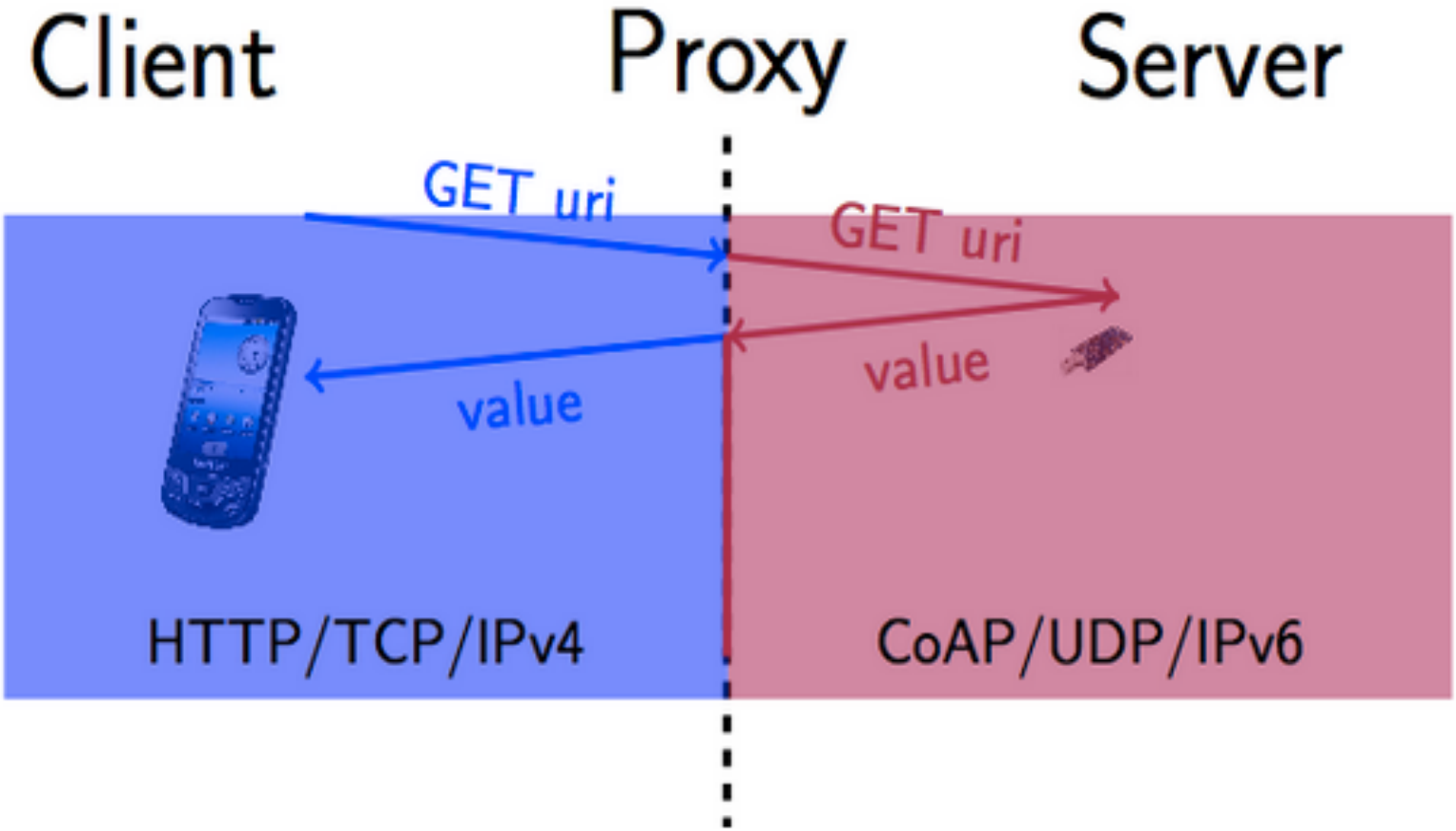
IPv6	IPv6
	6LowPAN
L2	802.15.4 MAC
PHY	802.15.4 PHY

Applications	Applications
	CoAP
TCP/UDP	UDP
IPv6	IPv6
	6LowPAN
L2	802.15.4 MAC
PHY	802.15.4 PHY

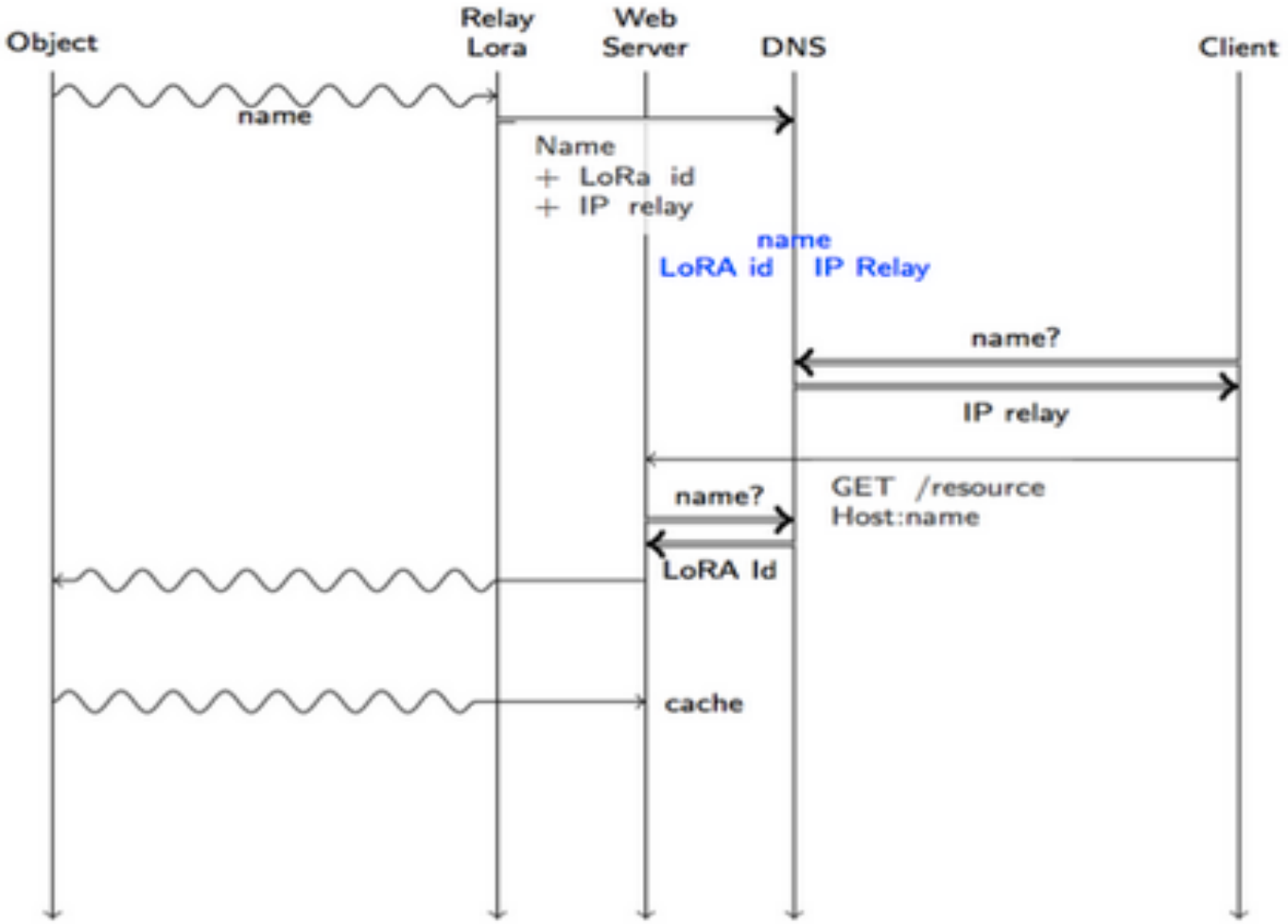
Use of DNS

- ✓The id of the device could be MAC, IPv6 or IMSI
- ✓Is it possible to associate the device ID with a name from the Internet?
- ✓ such as kitchen-light.subscriber10.parisfablabs.fr
- ✓ Need
  - ✓ Privacy reasons
  - ✓ Ease of identification

How communication is done?



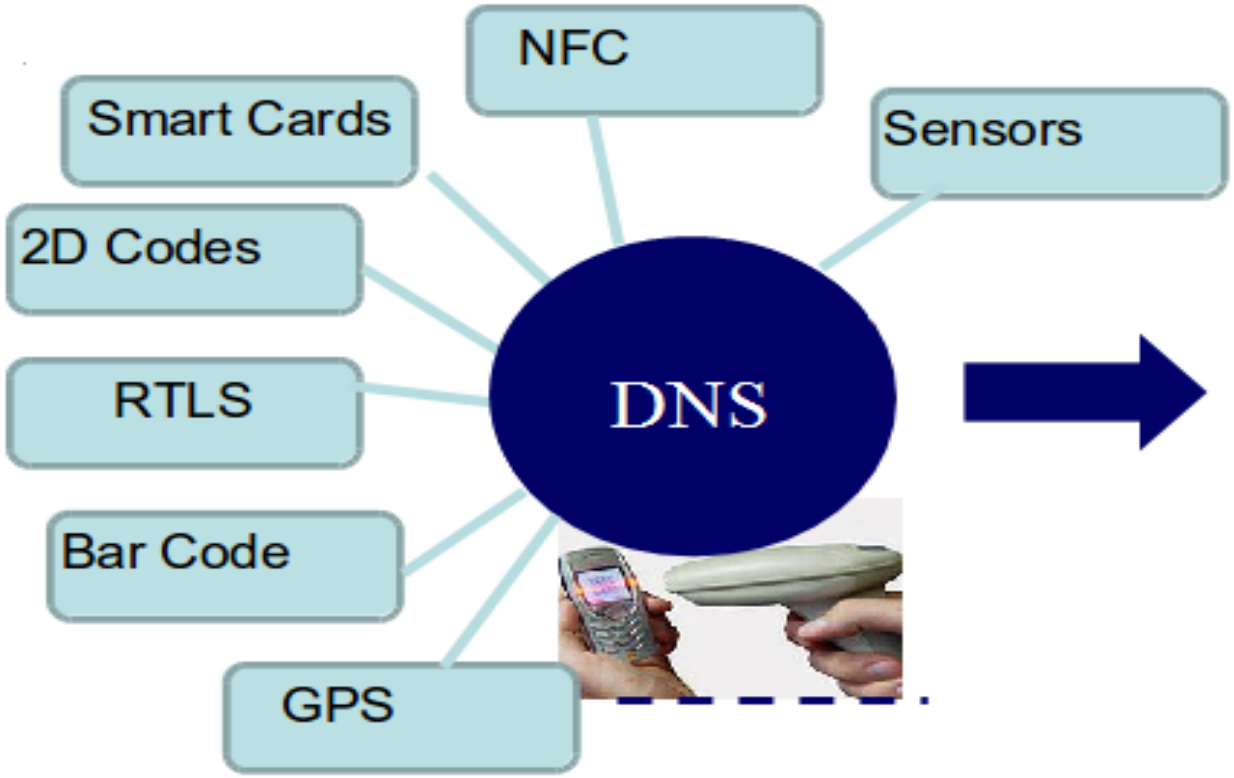
How communication is done?



Future activities

- ✓Registering and terminating a device
- ✓ Resolving the device address
  - ✓ TXT
  - ✓ DNS-SD
  - ✓ NAPTR
- ✓ Mobility
- ✓ ….

Approach



Merci !

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