

Why DNS should be the Naming Service for IoT?

LPWAN PARIS17



Some terminology

Identity

- Definable and recognizable (.e.g. “Sandoche’s Apple Watch”)
- Need not be unique and does not need to follow any particular “naming convention”

Identifier

- Identifying an object. Could be physical or virtual
- Need to be unique and follow a particular “naming convention”
- E.g. UDID is the naming convention for Apple watches which is as follows :

  “2b6f0cc904d137be2e1730235f5664094b83118 ”

Addressing

- Identifying an object uniquely in the scope of communication
- Need to be unique and follow a particular “naming convention”
- E.g. IPv4/IPv6, MAC
- Address & Identifier can be the same (or) different

Naming Service

- Mapping the unique identifier to its appropriate unique service/information
- Apple watch uses the identifier “UDID” to communicate with an iPhone/iPad for service discovery



Internet

Resolution

Identifiers

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balakrichenan@afnic.fr

Naming Service

DNS

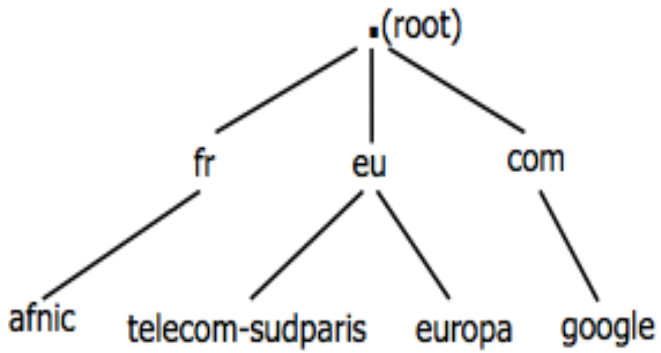
Application





Provisioning (Hierarchical)

Naming Authority

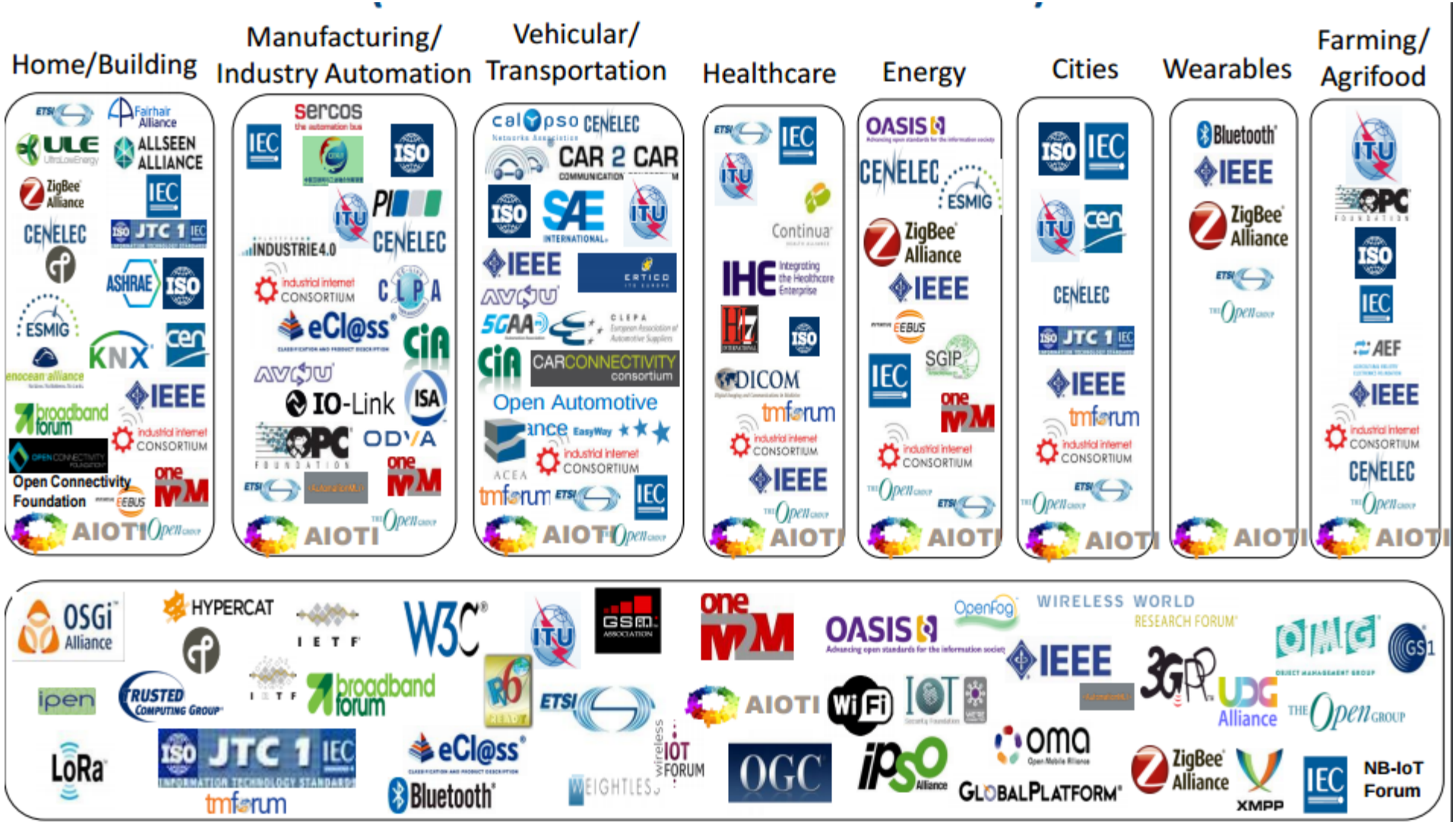


Naming convention for the Identifiers

IETF

- Domain names, URI
- IP Addresses (IPv4/IPv6)

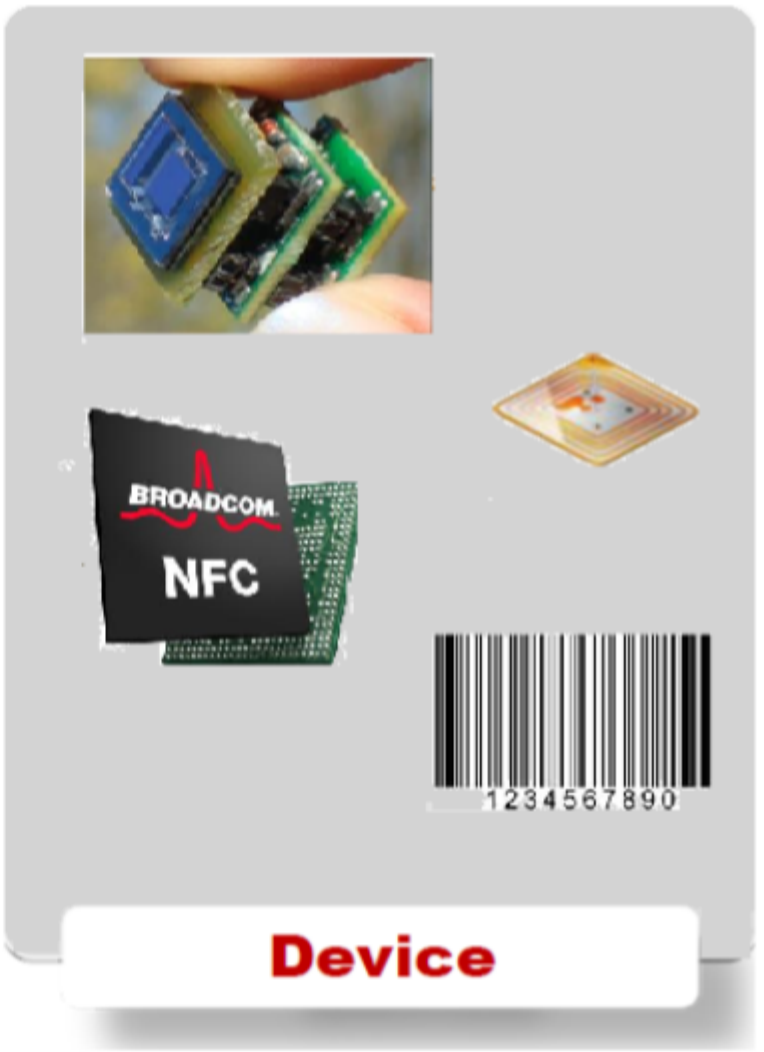
IoT SDOs and Alliances landscape



Source: AIOTI WG3 (IoT Standardisation) – Release 2.7

Making the things identifiable in IoT





IoT applications – Farming industry without DNS



Identifier

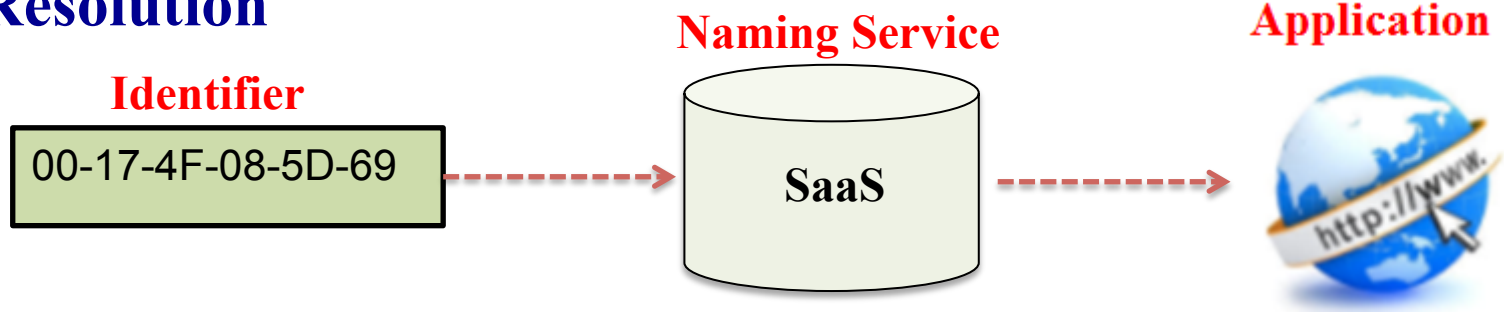


Naming convention = EUI-48 and EUI-64

MAC address Provisioning

- 00-17-4F-08-5D-69
- Blocks – assigned to vendors by the IEEE
- Adapters - assigned by the vendor from its block

Resolution



IoT - Consumer Industry without DNS

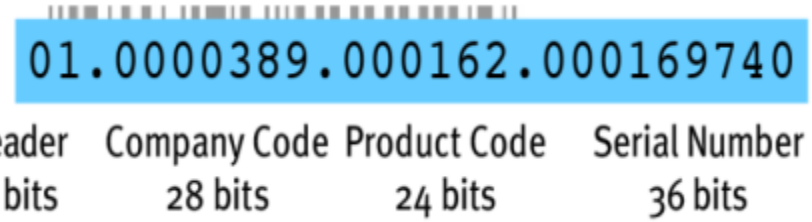
Resolution

Naming Convention = EPC

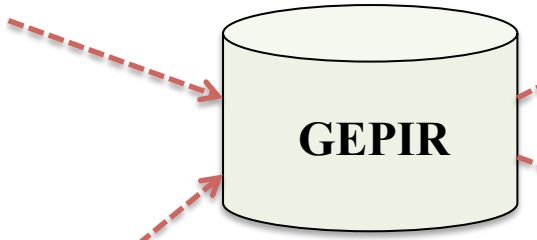
Barcode



RFID



Naming Service



Application

Extended Packaging

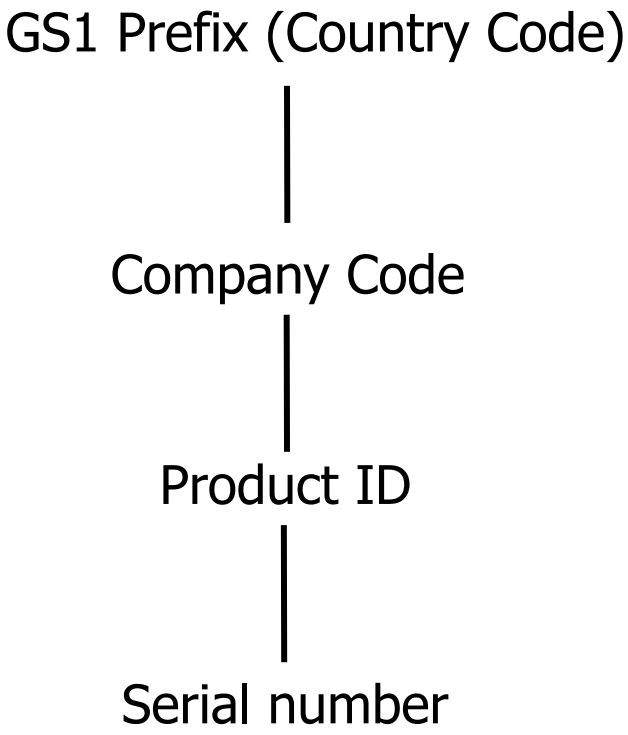


Track & Trace

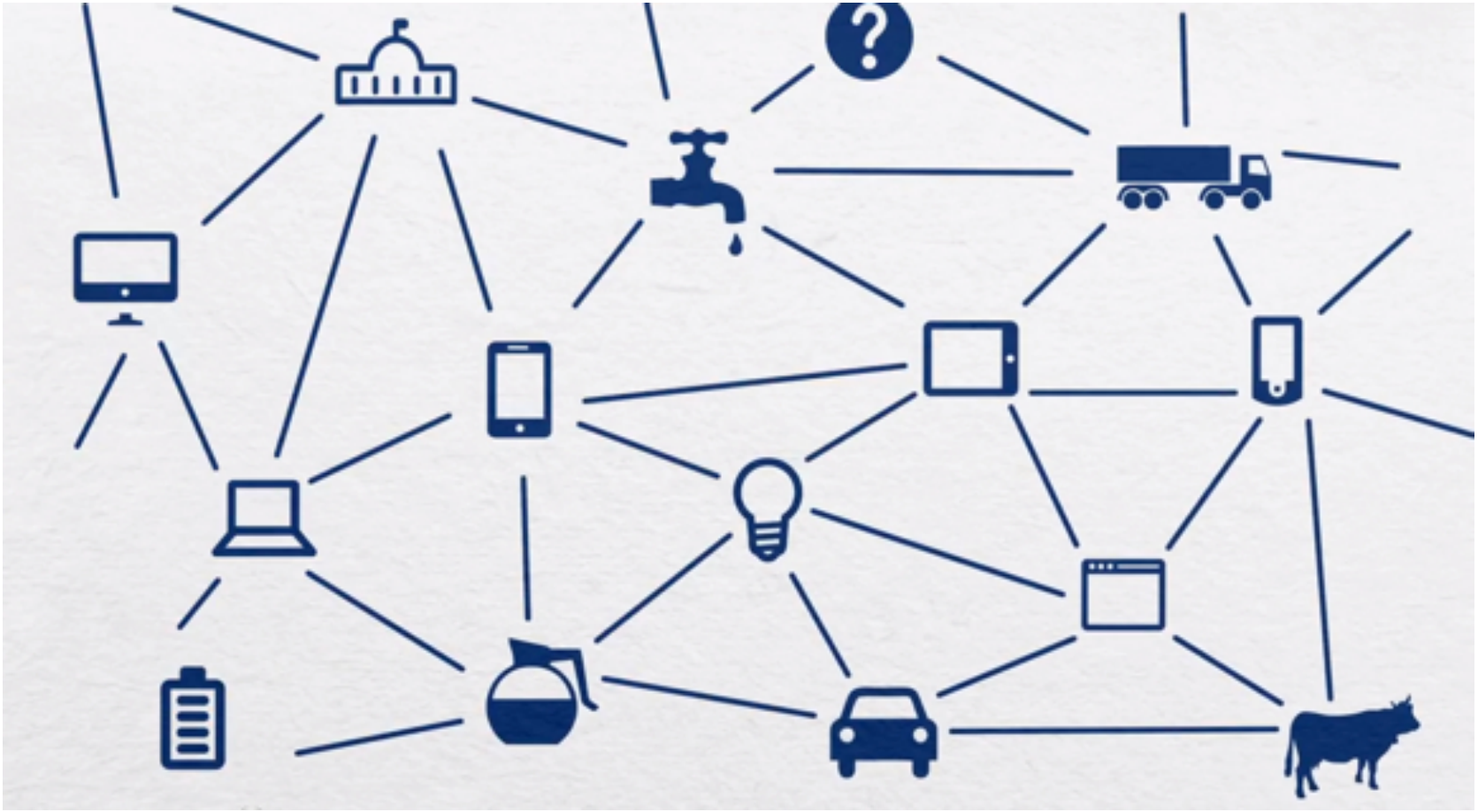


IoT - Consumer Industry provisioning

EPC Provisioning (Hierarchical)



Need = I(Internet)oT



IoT - Consumer Industry using DNS

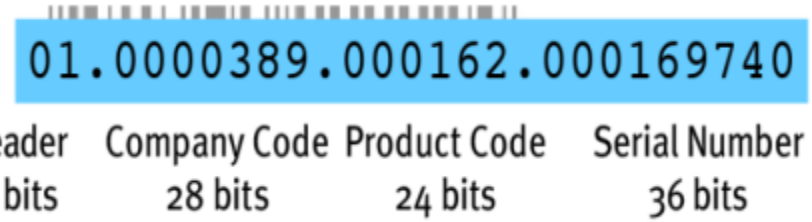
Resolution

Naming Convention = EPC

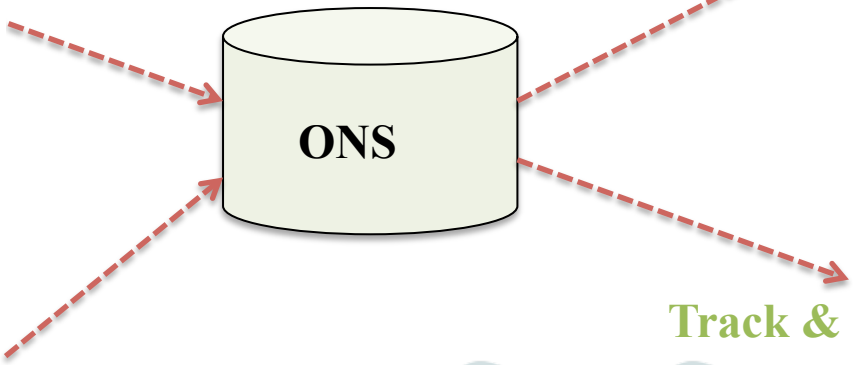
Barcode



RFID



Naming Service



Application

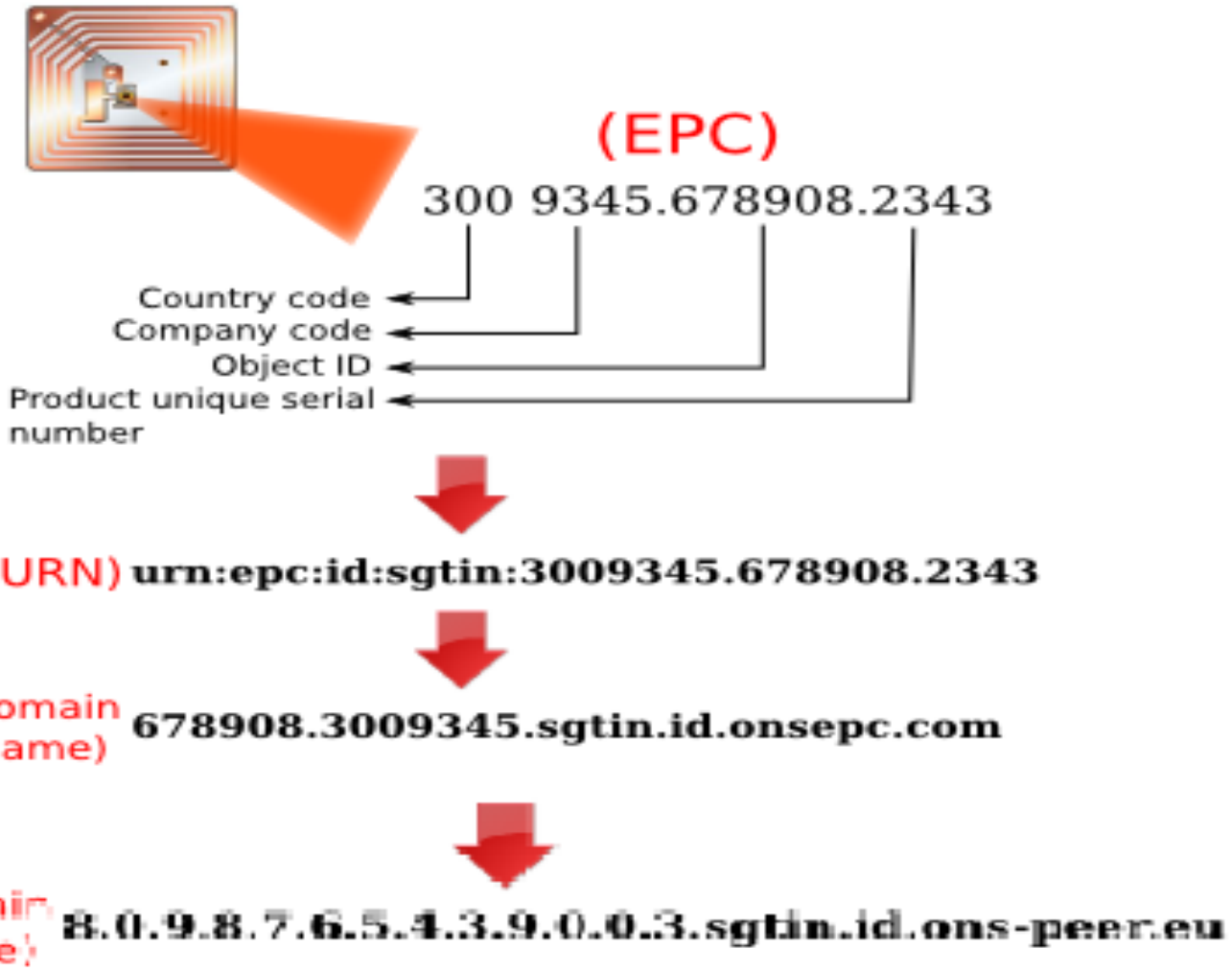
Extended Packaging



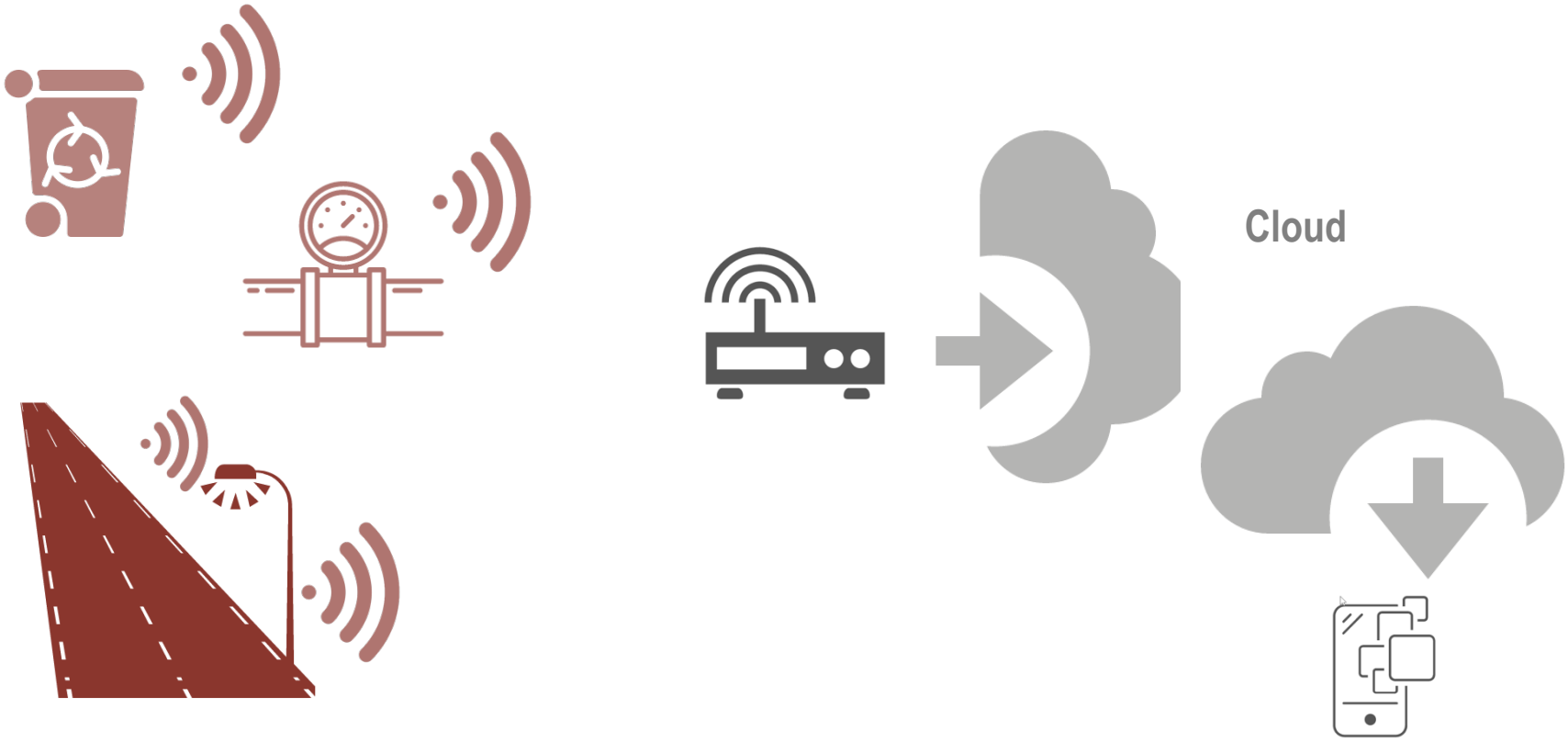
Track & Trace



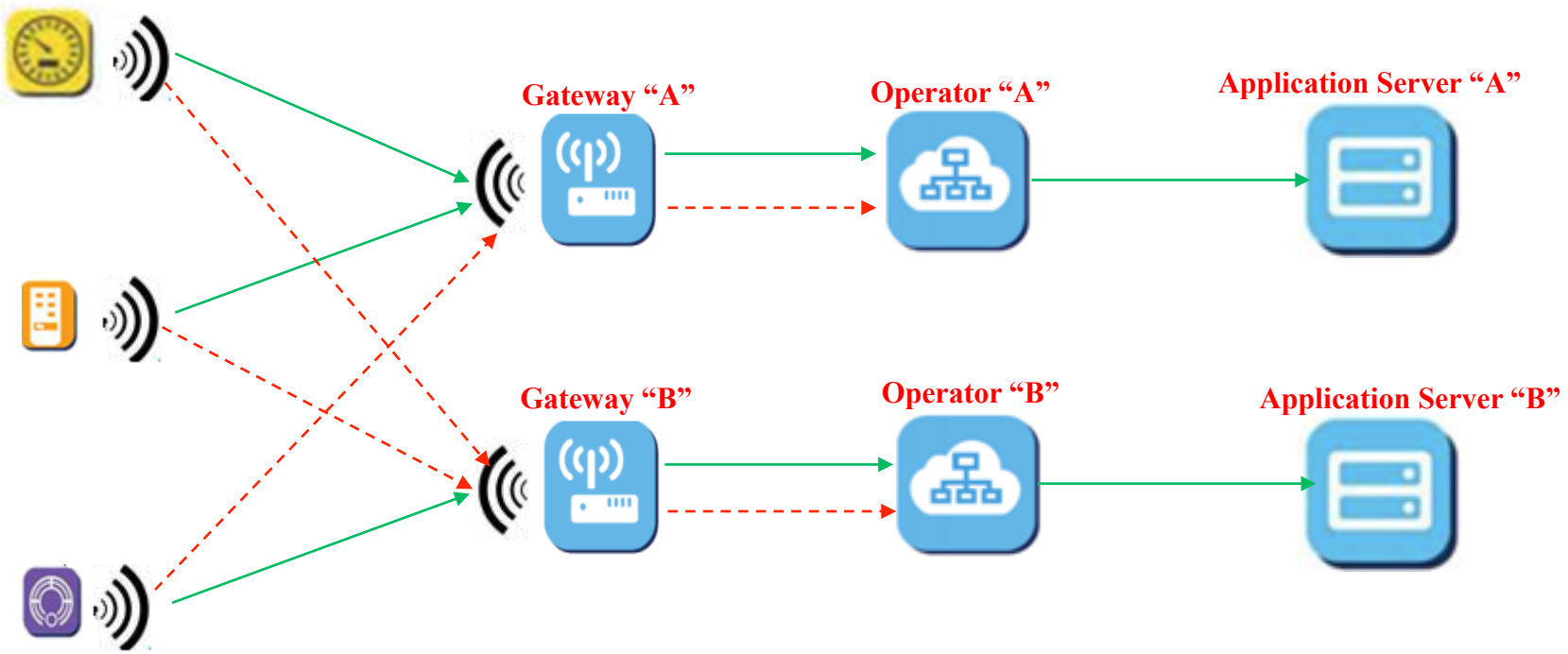
IoT - Consumer Industry FQDN



IoT - LoRaWAN Industry eco-system



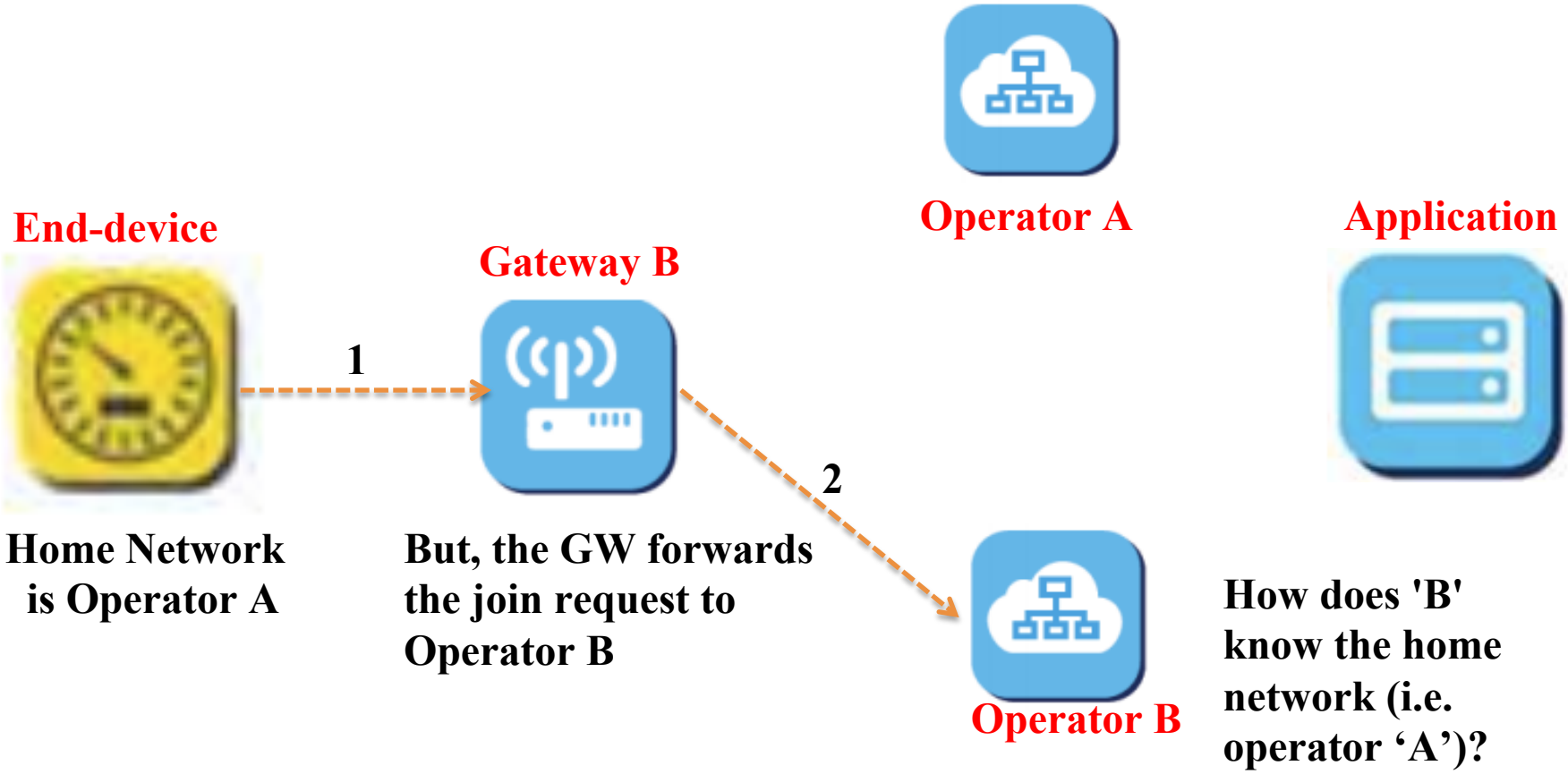
Detailed view of the LoRa network



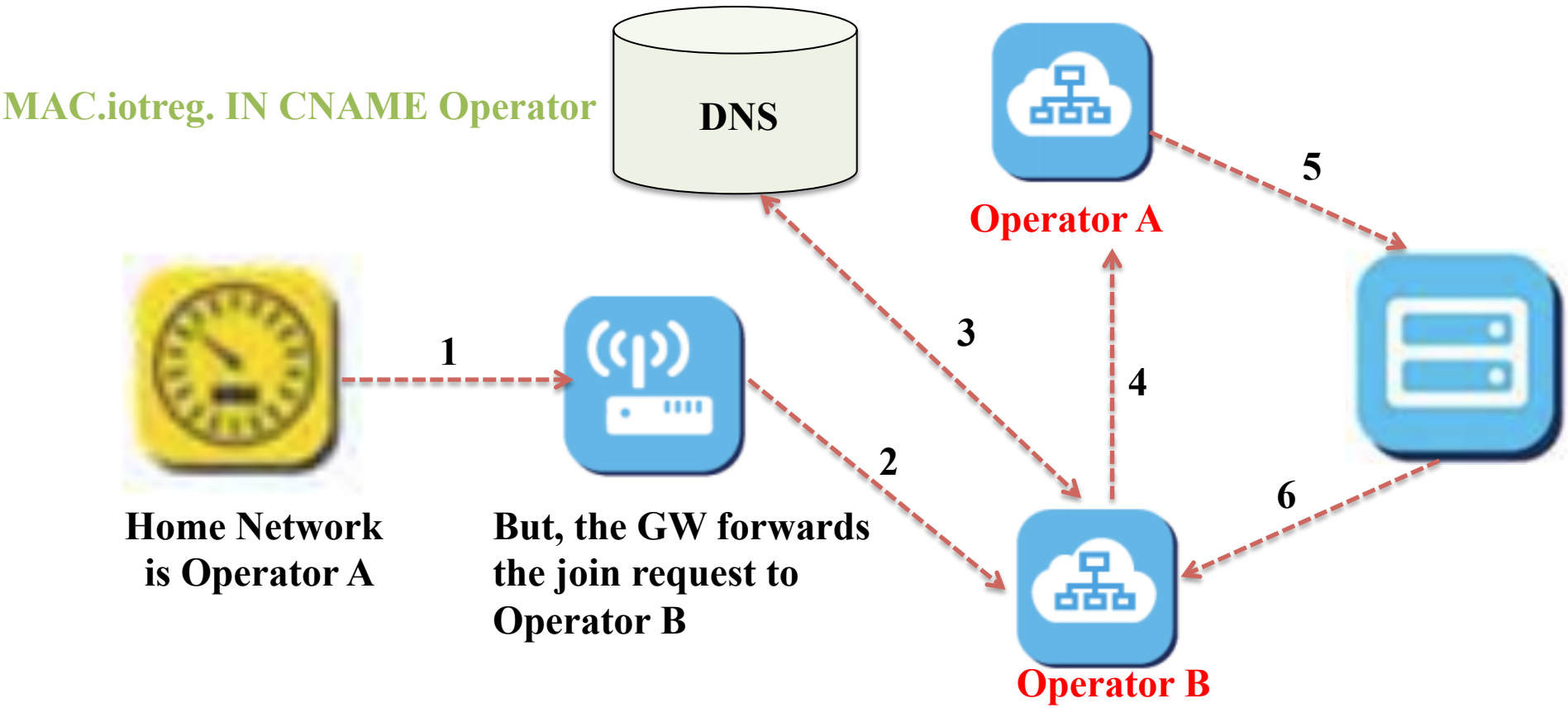
“A” Network

“B” Network

Portability issues in LoRaWAN



Possible solution for portability using DNS




```
FAB0000000000007.iotreg.net.    IN CNAME  FAB0000000000007.Orange.rd.nic.fr.
FAB0000000000024.iotreg.net.    IN CNAME  FAB0000000000024.Bouygues.rd.nic.fr.
FAB0000000000011.iotreg.net.    IN CNAME  FAB0000000000011.Orange.rd.nic.fr.
```

Requirements for a naming service

- ✓ Must be scalable
- ✓ Must work for legacy and new naming conventions
- ✓ Should work for hierarchical and flat identifiers

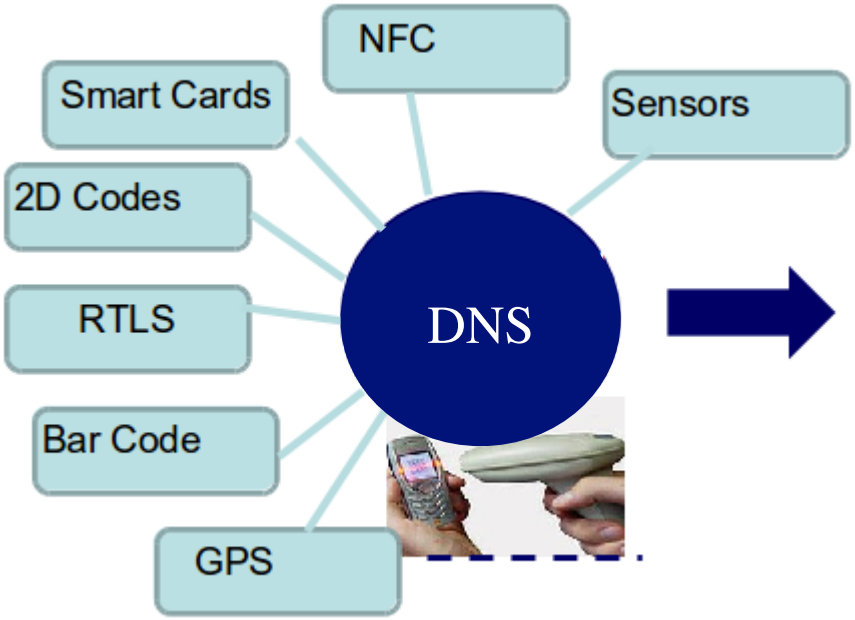


DNS satisfies all the requirements

Standardisation in naming service

- ✓ Identifier : Domain names, URI etc.
  - ✓ *SDO : IETF*
  - ✓ *Naming Service : DNS*
- ✓ Identifier : EPC
  - ✓ *SDO : GS1*
  - ✓ *Naming Service : ONS (Overlay over DNS)*
- ✓ Identifier : OID
  - ✓ *SDO : ITU and ISO/IEC*
  - ✓ *Naming Service : ORS (Overlay over DNS)*
- ✓ Identifier : DOI
  - ✓ *SDO : ISO*
  - ✓ *Naming Service : Handle*

Vision



Merci !

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