



# WINGS – Building a Federated Architecture for the IoT

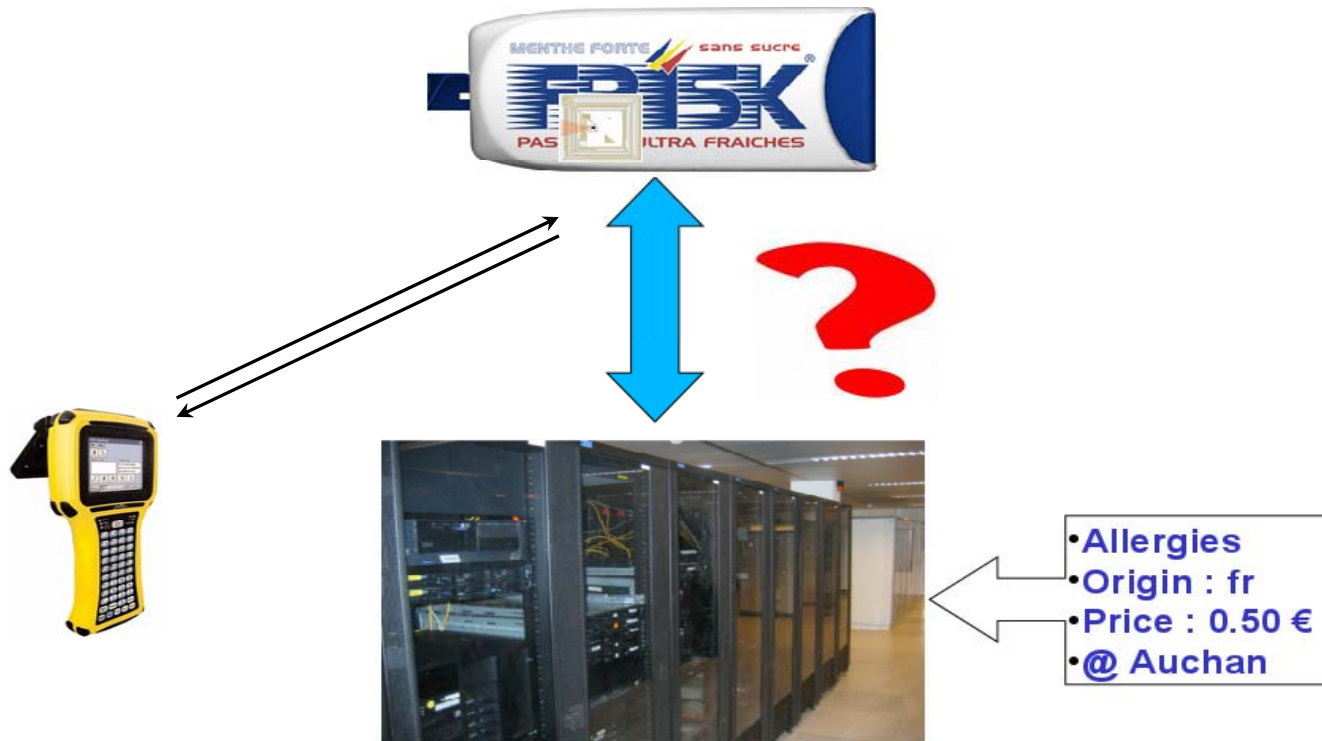
25/03/2011

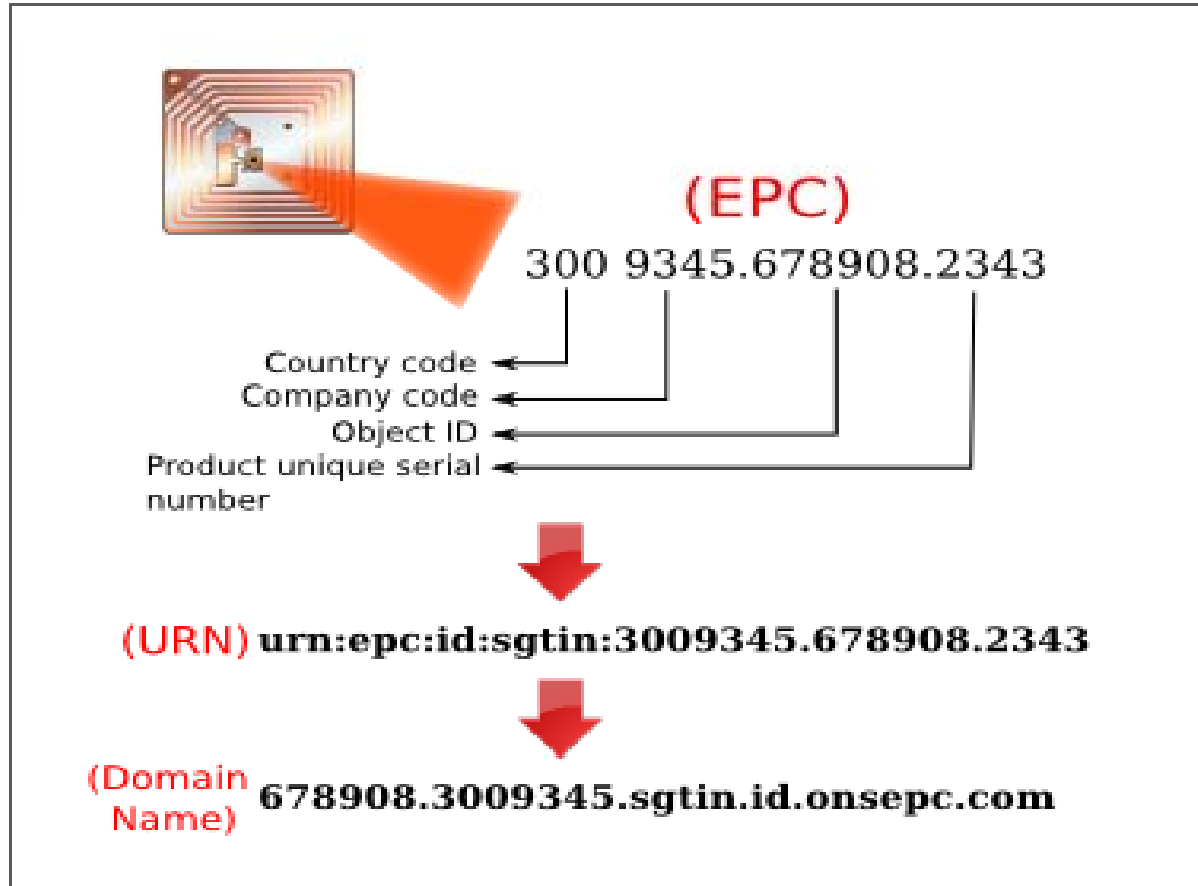


WINGS b n ficie d'une aide de l'Agence Nationale de la Recherche sous la r f rence ANR-09-VERS-015

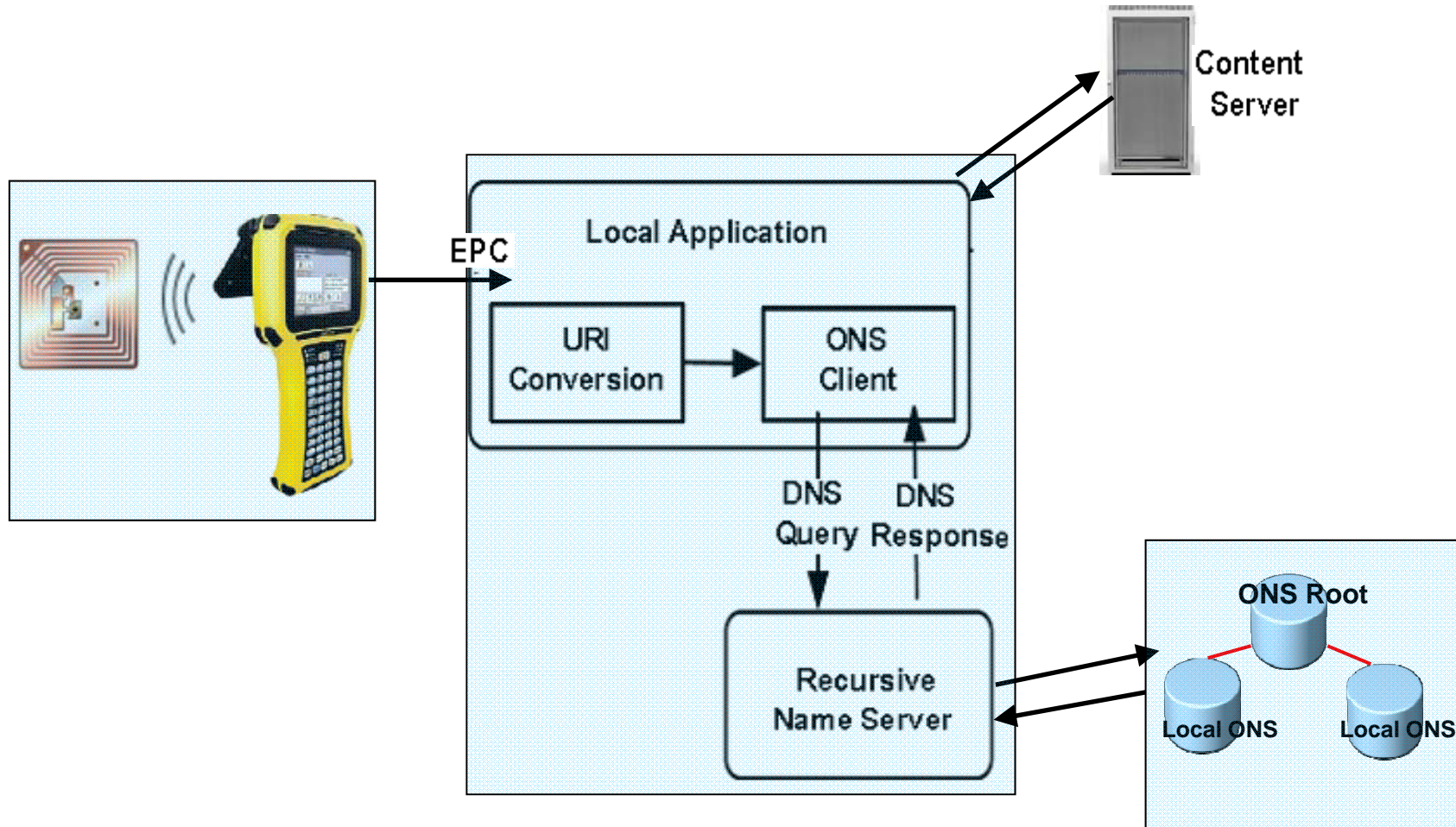
- **ONS introduction**
- **Issues**
- **WINGS project**
- **Standardization activities in ONS**
- **Contribution & Opportunities**

# How can Objects be visible on the Internet

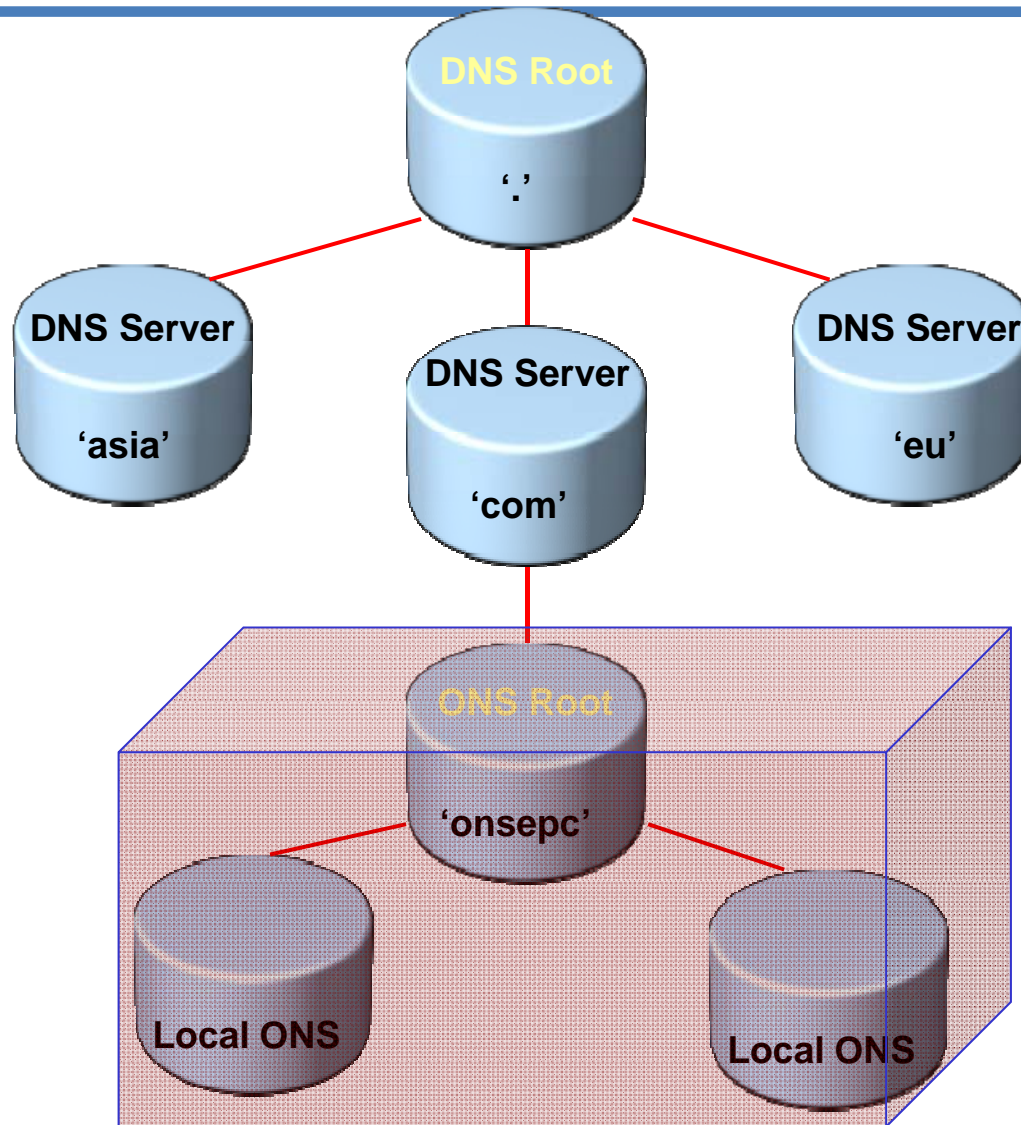




# WINGS ANR ONS Functionality (Current Standard)



# Current Single-Root ONS Architecture



# ONS Governance Perceived Issues

## (European Institutions Comments)

<p>EpoSS: “Internet of Things in 2020”</p>	<p>EPC Global architecture has a “<b>single point of failure and control</b>” where a single company, VeriSign, has the records of all the numbers, and can track where any object is.</p>
<p>EESC on the IoT (Sep. 18, 2008)</p>	<p><b>Over-centralization</b> of critical RFID application resources raises potential concerns both from <b>sovereignty</b> and <b>subsidiarity</b> aspects and from the operational business viewpoint.</p>
<p>CONSILIUM conclusion on Future networks (Nov. 27, 2008)</p>	<p>With respect to the IoT, deepen the reflection on the development of <b>decentralized architectures</b> and promoting a shared and <b>decentralized network governance</b></p>
<p>EU Policy Outlook RFID – June 25/26th 2007</p>	<p>Proposed measure: The European Commission should thus work towards a localized, dependable and interoperable setup of look-up mechanisms and systems like the ONS which allow a <b>decentralized operation</b> and a competitive approach.</p>
<p>Bernard Benhamou: "A EU Governance Perspective on the ONS"</p>	<p>Trying to imagine one <b>single country</b> having <b>all the control over the ONS</b> system without a single dispute arising is simply impossible to do. It is certain that the political concerns and public policy issues surrounding it are so important on all economic, privacy and strategic levels that it is hard to imagine other countries letting the issue go without a fight - they simply will not let this happen.</p>



# Federated ONS Requirements

(Drafted by the EPC ONS requirements committee)

Every Peer in the Federation shall meet minimum service requirements such as (a) System response time and (b) System availability

GS1 Member Organization shall be responsible for the selection of its peer.

Interconnection/Transparency (Every peer in the federation shall provide necessary connections to support a seamless resolution of ONS queries)

Updates (If any peer level zone is to be updated such as addition, removal, delegation change etc.) all the other peer zones in the ONS federation MUST be notified in a timely fashion prior to the update.

ONS must support queries in cases where the separation between the company prefix and the object qualifier is not known.

Accommodation of non-GS1 identifiers

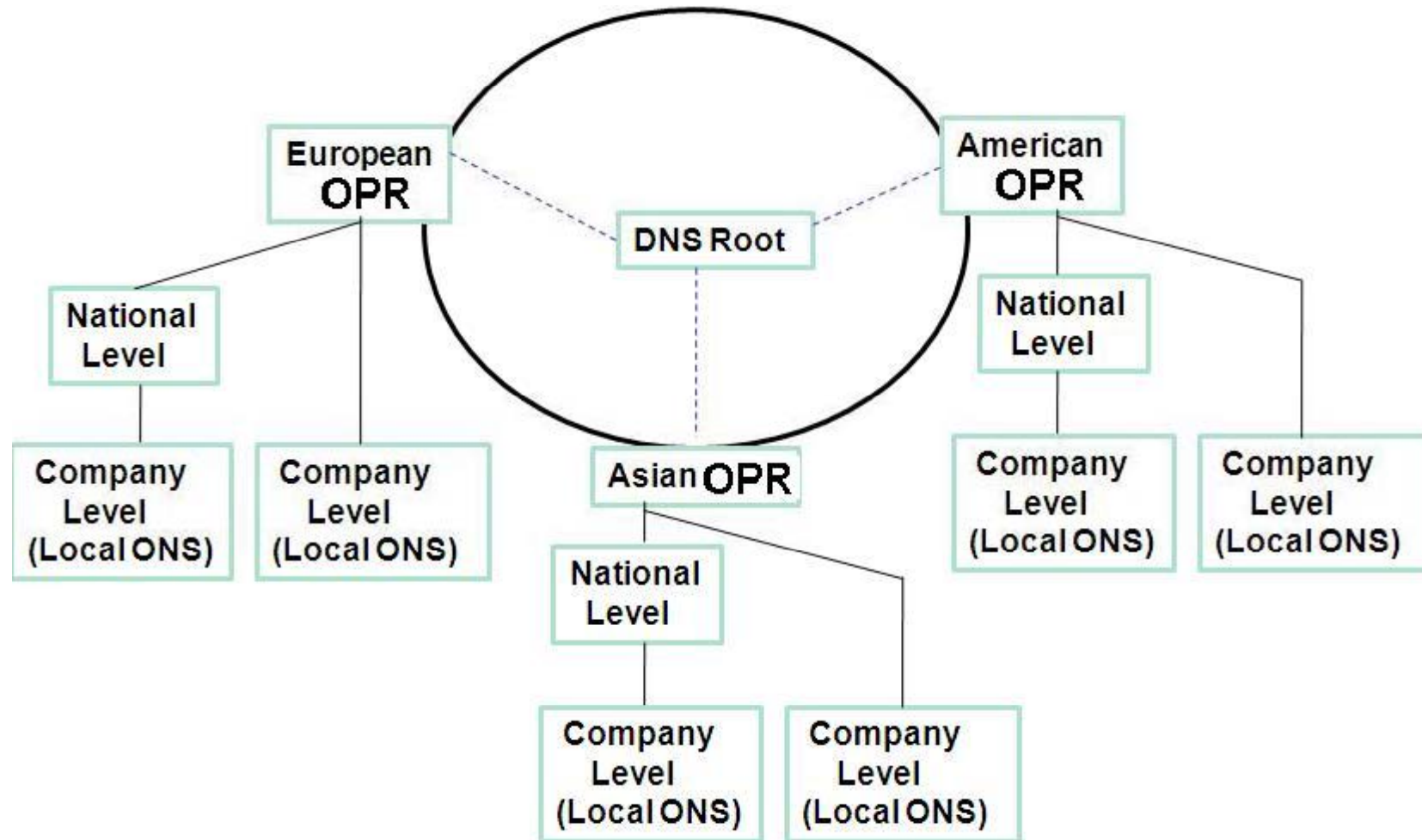
Uniqueness (An identifier using the FONS infrastructure should be unique irrespective of the type of identifier)

Federated ONS should have provisions against anticipated threats

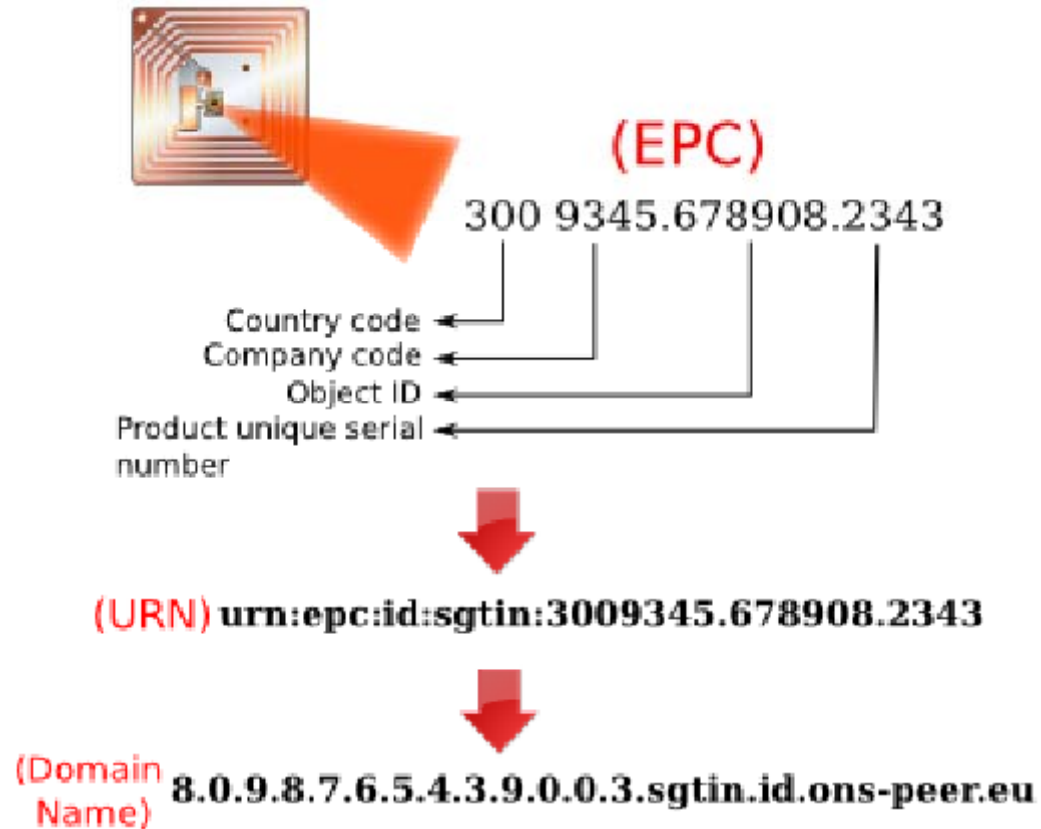
The FONS model and the Single root ONS model should interoperate with each other

Dynamic service definition

- **WINGS (Oct.2009 – Oct.2011)**
- ***Objective* : Propose, experiment and evaluate two alternative F-ONS architecture : DNS & P2P based**
- **Experience from this project has already helped to contribute to the requirements document drafted by the EPC ONS requirements committee**
- **Experience from the WINGS project will aid to contribute to the standards process on ONS as well as Discovery Services.**



# Query Format





# Co-operation between Peer Roots (Redirection)

---

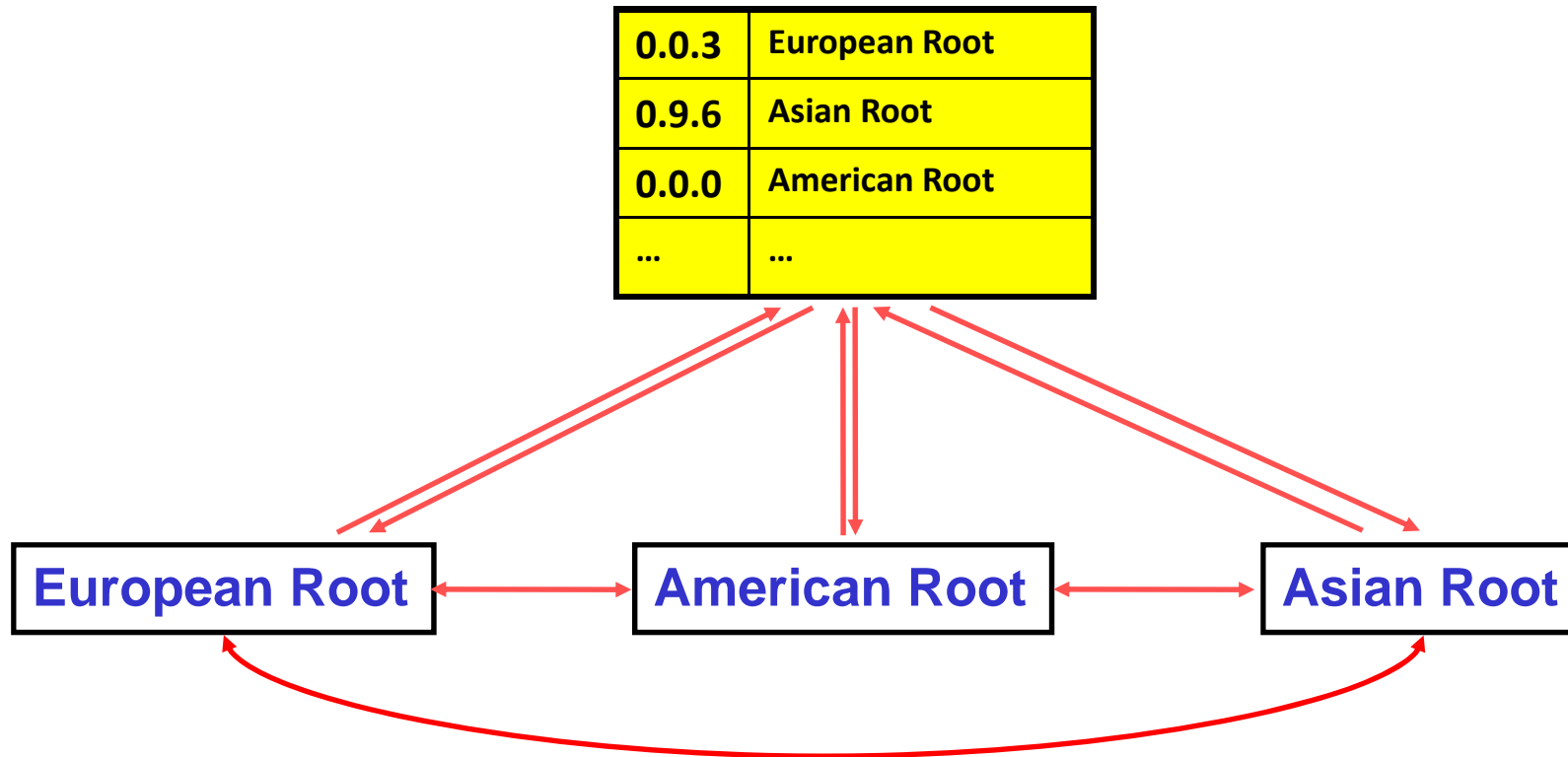
.....

0.0.0.sgtin.id.europeanroot. IN DNAME 0.0.0.sgtin.id.americanroot.

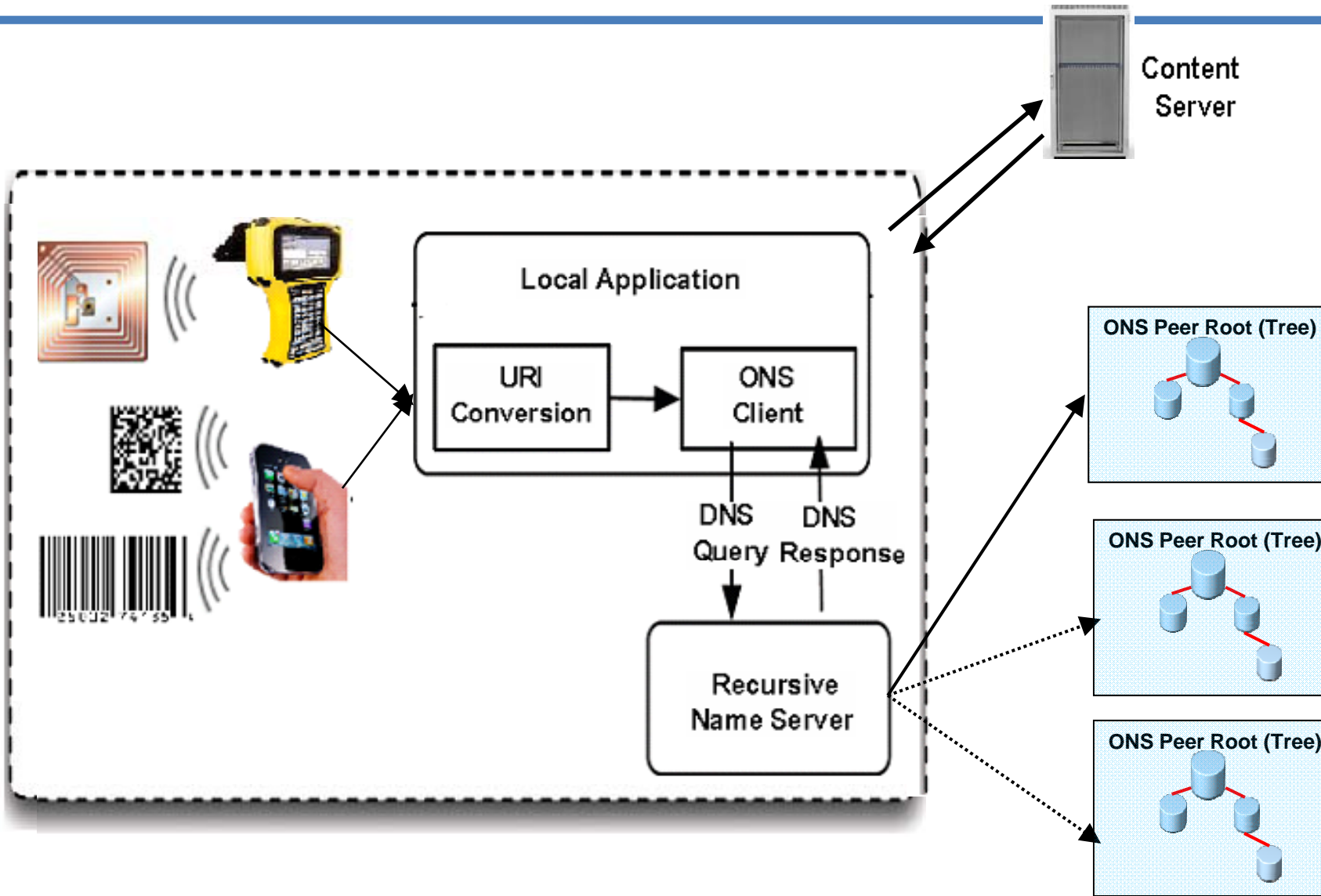
0.9.6.sgtin.id.europeanroot. IN DNAME 0.9.6.sgtin.id.asianroot.

.....

# Co-operation between Peer Roots (Updates)



# F-ONS, How it works?





# Review of the FONS requirements

Every Peer in the Federation shall meet minimum service requirements such as (a) System response time and (b) System availability

GS1 Member Organization shall be responsible for the selection of its peer.

Interconnection/Transparency (Every peer in the federation shall provide necessary connections to support a seamless resolution of ONS queries)

Updates (If any peer level zone is to be updated such as addition, removal, delegation change etc.) all the other peer zones in the ONS federation MUST be notified in a timely fashion prior to the update.

ONS must support queries in cases where the separation between the company prefix and the object qualifier is not known.

Accommodation of non-GS1 identifiers

Uniqueness (An identifier using the FONS infrastructure should be unique irrespective of the type of identifier)

Federated ONS should have provisions against anticipated threats

The FONS model and the Single root ONS model should interoperate with each other

Dynamic service definition

- **A functionally tested DNS based F-ONS platform in the Internet with different peer ONS roots implemented in different WINGS partner's location**
- **Used the experience obtained for real business use case (Proxi-Produit)**
- **A P2P based F-ONS platform**
- **Recommendation to F-ONS standards**

- **Gained experience & expertise on a topic that has been a requirement of the EU Stakeholders**
- **If Europe wants to conserve its advance in this domain, this platform has to be provisioned and experimented by real user data**
- **Industrial participation is also needed to evolve the standards**
- **FONS has a valid economic model**
- **Lot of research issues to be solved**