

A New Model for Supporting Standardisation of an Open Governance for the Internet of Things

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As we move forward towards the ambient intelligence environment where most devices are connected to seamless, ubiquitous networks, the inter-enterprise interoperability is an essential condition. As a matter of fact, the exciting opportunities come from the fact that this scenario will be developing a complex network which will have the characteristics of 'The Internet of Things'. But a real positioning of the stakeholders to develop an open governance model for this style and size of network is still missing today.

That is the subject of this paper focusing on the large scale EPCglobal network as being part of the Internet of Things and in which two ONS (Object Naming Service) roots are in existence today.

For ensuring the interconnection and the interoperability of these roots, GS1 in Europe is therefore working on an EPCglobal network topology that will consist of a combination of a centralized model with a ring of peer ONS roots.

Keywords: Governance, ONS, EPCglobal, GS1, network topology, standards

1 Concept and objectives

A world where global supply chains are the norm requires that RFID tags and associated sensors can operate, can be seen and can be interrogated anywhere in the world. Based on the openly defined and implemented EPCglobal network architecture, we move on from some localised RFID applications towards the 'Internet of Things' or rather an 'Intranet of Goods' as it can be designed in a networked business-to-business world. With reference to the development of a federated network infrastructure which provides the communication and information transport for the ambient supply chains, this network needs then to be able to operate both locally and to be linked globally (ie the ability to be de-centralised and to appear to be centralised).

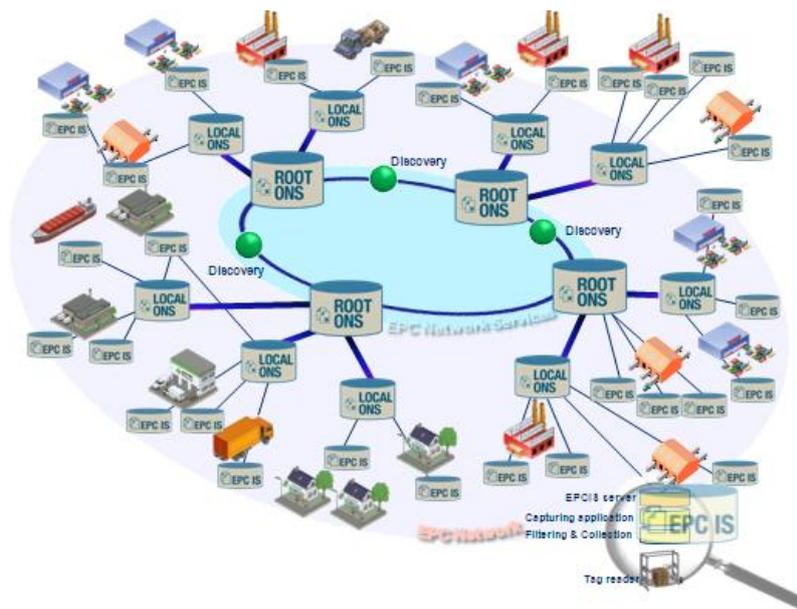


Fig 1. The distributed model of the EPCglobal network : the combination of a centralized model with a ring of peer ONS roots.

2 Progress beyond the state-of-the-art

Since the launch of the EPCglobal standards, more and more companies have started to explore the possibilities of using the related technologies, services and interfaces such as the EPCIS, which represents the first step towards the usage of the EPCglobal network. As the foundation for the kind of connectivity that will increase visibility throughout global supply chains and help trace shipments, combat the introduction of counterfeit products and prevent retailer out-of-stocks, new class of applications are various.

But to understand the need of the EPCglobal network evolution we have to remember that, at the beginning, it was based predominantly on the needs of food manufacturers and retailers. Therefore, the architecture of the current EPCglobal network is heavily focused on the needs of these business scenarios. However, in the course of time, organisations are beginning to adopt RFID further up and down the supply chain and also beyond small scale or sporadic deployments, involving a growing number of industries in various sectors such as healthcare, aerospace, automotive, defence etc.

So the next phase of the EPCglobal network development will have to allow flexible integration of product information provided by a large number of organisations horizontally across the supply chain, and also vertically across various other industries. This move from small localised activities to large cross-company and cross-country networks will require both more complete and more comprehensive data sets. This implies efficient data synchronisation, guaranteed data availability and improved data security. There is, as a result, a need for data alignment and standards evolution, including one for a so-called Object Naming Services (ONS), which defines the interface for lookup services by providing quasi-permanent or relatively static links between the identity of a company responsible for an object (often the

manufacturer) and the authoritative information services which that company provides.

The extension and improvement of current solutions to other domains originate some questions about effective management of increasing amount and variety of data that will be exchanged between partners. In this way, the poster will initiate further developments of scenarios to characterise this new model of network architecture and infrastructure, having regard to imagine the future value chain.

In the meantime, GS1 in Europe has launched its own ONS root platform in order to respond to geopolitical concerns and to elaborate theoretical concepts of the EPCglobal network components into a real environment. Other regions in the world are also evaluating to have their own ONS running.

That's why, to support various organizations for achieving world-wide adoption and standardization of the EPC technologies in an ethical and responsible way, this increase in scale for the network also demands the development of an open governance model. Subsequently, this open governance model can be extended to incorporate various ONS systems from other parts of the world, both on technical and business aspects that would be administrated under a common set of rules. Drawing on the ONS root operated by GS1 in Europe, we would take advantage of the poster session to present a set of rules for the governance, including for instance standards for naming issues and the use of security tools such as certificate authority, privacy management, etc. In order to carry out this task from a technical point of view, a request for proposal has been sent out to scientific partners.

Furthermore, the aim of this platform is to give the European Community a leadership role in developing ambient intelligence in the supply chain and thereby enhancing competitiveness through leadership in implementing broadly-based, open business enterprise networks. This development represents the important move onwards from RFID supply chain applications the poster will figure out what it implies.

3 Methodology and process

Through the practical perspective offered by a proof-of-concept ONS platform with multiple roots, the platform management and the standard development process are driven by user requirements.

While following a usual path by developing requirements for the network, running a pilot then analysing the results, this work focuses on very innovative and challenging topics that will be demonstrated and exploited to bring the benefit not only to the project's partners but the whole European community.

The work is also developing in connection with other IST projects and standards groups so that project results can be discussed to influence standards development.

It is actually fully intended to use the learning from this demonstration to enhance then the ONS standard specification in a 2.0 version.

In addition GS1 has a significant solution provider membership, especially in the auto-identification and data exchange arena, with which we work closely to ensure that general requirements and developments are feasible ('the art of the possible').