

# Towards a Federated Architecture for Future Supply Chains Systems

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**Abstract.** The WINGS project designs federated ONS architectures embedding Discovery Services to retrieve decentralized data warehouses of manufacturing goods.

The objective of WINGS is to design, develop and evaluate technical solutions for managing the ONS in a completely decentralized fashion (*Federated model*), interacting with Discovery Services. Architectural approaches and choices recommended by WINGS will be issued in standards development process.

The French Research Agency (ANR) [1] supports WINGS in the framework of the program "Future Networks and Services" (VERSO).

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## 1. Introduction

Global supply chains operating in a networked business-to-business world present tremendous challenges and opportunities for the so-called "Internet of Things". In prospect, huge amount of different types of objects connected to seamless and ubiquitous networks will bring end-to-end visibility to the supply chain. To do so, interoperability between enterprise information systems is an essential condition, as outlined in the Global Commerce Initiative's Report – 2016: The Future Value Chain [2].

This next phase of supply chain development is already on stage through the EPCglobal standards and its architecture framework. One of its key standard-based components is a centralized object directory service called the ONS (Object Naming Service) [3], which provides a lookup mechanism that enables anyone to find the address of services, such as traceability repositories. Given the importance of ONS systems in the near future, the WINGS project [4] aims at developing alternative solutions to the incumbent architecture. To ensure the further interconnection and interoperability of multiple roots, the project partners propose to design and evaluate a

federated ONS system that will function in interaction with Discovery Services for accessing decentralized data warehouses along the supply chain.

## **2. WINGS for a Federated Architecture and Services**

WINGS (Widening Interoperability for Networking Global Supply Chains) will contribute in the implementation of ambient intelligence in the supply chain with broadly based and open business enterprise networks. Hence, the project short name “WINGS” as it will lend wings to the Internet of Things.

Besides the standardization efforts currently in progress, WINGS will contribute in enhancing solutions and services. Based on the open standard protocol DNS, ONS enables innovative applications to be dynamically developed on top of various platforms. As ONS leverages a well-known and available protocol, it will dramatically reduce development costs for Internet-based applications including – but not restricted to – business-to-business scenarios. This approach reduces costs for the brand owners by enabling them to follow a standards-based approach for delivering messages to their economic partners and customers. The ability of ONS to connect users to authoritative sources of information about an object will in addition give rise to a new class of applications offering trusted and value-added information. WINGS will advance as a result the development of new and innovative products and services.

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 participants of the FES workshop will have to react on further developments of scenarios to characterise the network architecture and infrastructure (definition and implementation), having regard to imagine the future value chain.

To support various organisations, 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 GS1 France project to initiate an ONS root in a European context, the FES workshop will be the opportunity to discuss the definition of 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.

Furthermore, the aim of this project 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 workshop participants will have to figure out what it implies.

## References

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