

**Manifesto of
Service Oriented Infrastructure
Working Group**

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Context

NESSI identifies the adoption of *Service Oriented Business Models* as a fundamental shift that is necessary to change the European economy into “*the world's most dynamic and competitive knowledge-based society*” [1]. This paradigm shift manifests itself by the “*evolution of business models from the sale of products to the provision of electronic services*”, where services are seen as utilities that can be used but that are not owned by users. Ultimately, this shift will mean transforming the Internet to service the daily life of citizens, businesses and organizations.

Enabling this paradigm shift, it is clear that a new generation of ubiquitous and converged network and service infrastructures is required that support construction and deployment of highly scalable, flexible, manageable, context-aware, ubiquitous, dependable and secure services.

The Service Oriented Infrastructure WG is focused on research topics around the lower level infrastructure component services run on. This component services can be composed and orchestrated to support processes which will be ultimately delivered to the user through an user/service adaptive interaction layer.

Key research challenges in the area of Service Oriented Infrastructure were outlined in [2] and addressed by the proposed Working Group.

Mission

The Service Oriented Infrastructure WG is focused on the new generation of ITC infrastructures that will support development and execution of component services and their provision as utilities. It will focus on designing a detailed research agenda on the following areas:

- **Service abstraction and virtualisation**: Architectures, languages and tools that enable (1) provision of services as utilities supporting different levels of abstraction and virtualisation of resources, dynamic monitoring of SLAs that are internal to service containers and the dynamic reallocation of services; (2) reliable, multi-protocol dynamic binding, with endpoint virtualisation; (3) user device based ownership and management of profiles, service runtime properties, histories and content investigating the adoption of semantic technologies; (4) any device as a service endpoint: evolution to complex and extremely distributed scenarios on very different scales of machines, starting from Grid based systems down to PDAs and RFIDs; (5) multi-scale challenges, including architectural (organizing and structuring systems at different scales using component-based middleware and software engineering) and algorithmic (P2P algorithms and systems) for adapting the infrastructure to domain specific needs.
- **Inherently Stable and Safe Architectures**: Research, identify, and document principles and architectures that confer a high degree of stability, predictability, and trust to infrastructures and related deployed systems when considered from an end-to-end perspective. Also includes an analysis of those elements most contributing to a lack of reliability.

- Decision Support and Automation tools for IT Service Management: Development of automation and decision support tools aimed at improving the efficiency and effectiveness of IT service delivery and support including modelling, simulation and optimisation. This includes the following aspects: (1) IT Service and Resource Models (model IT changes and their dependencies), (2) Risk and impact analysis (assess IT failure/changes risk and impact), (3) IT Planning (how to better plan for IT services); (4) advanced and optimised resource scheduling and allocation/reallocation mechanisms.
- Technology bases for wide scale computing utility: new generation of operating systems for resources virtualisation, dynamic composition, allocation and support for autonomic behaviour, including computing, storage and networking with the aim of data-centres virtualisation.

It is anticipated that work will be carried out on identifying research topics around networked operating systems, advanced service containers and emerging concepts in the area of Grid.

The NESSI Working Group on Service Oriented Infrastructure will seek to work together with other NESSI working groups. This collaboration will be especially important with the Service Engineering WG and the Semantic and Web 2.0 User/Service Adaptive Interaction WG for the development of a complete end-to-end service model and architecture. Collaboration is also foreseen with the Trust, Security and Dependability WG in order to establish how security features have to be implemented at the Service Oriented Infrastructure layer.

Working Group Deliverables

- Refined inputs for the NESSI SRA, including structuring the domain, identifying clusters of research and priorities, and building a roadmap.
- Ad hoc inputs for the European Commission in support of inclusion of this research domain in FP7.
- Contributions to, and establishments of, appropriate scientific and technological forums, such as conferences, journals, workshops, etc.
- White papers.

Working Group lifetime

It is foreseen that the activities of the working group will span over a period of at least 2 years, starting October 1st 2006, with the following tentative milestones in the first 12 months:

1. Establish links with European projects and stakeholders in the area of application Service Oriented Infrastructures (Q4 2006)
2. Organize the first WG meeting (Q4 2006)
3. Contribute to the NESSI SRA with a chapter on Service Oriented Infrastructure (Q2 2007)

4. Organise several WG meetings (Q4 2006 - Q2 2007)
5. Deliver reports, evaluate 1st year and set 2nd year milestones

Membership

The following companies have expressed interest in forming part of the Working Group:

- Telefonica I+D (co-Chairman)
- BT (co-Chairman)
- SAP
- Engineering
- IBM
- Thales
- ATOS Origin
- Sun
- CRMPA
- Lero
- Alcatel
- University of Roma
- Optimo I+D
- Hitachi
- Grupo ETRA
- Xlab

References

[1] NESSI Strategic Research Agenda. Vol. 1. Framing the future of the Service Oriented Economy. Public Draft 1 – Version 2006-2-13-Revision 3.1.

[2] NESSI contribution to 7FP. NESSI confidential draft.