



Interactive Realtime Multimedia Applications on Service Oriented Infrastructures

ICT FP7-214777

**WP 9a Standardisation, Collaboration and
Exploitation**

D9.5.1 Initial Version of Collaboration Plan

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More information

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Glossary of Acronyms

Acronym	Definition
D	Deliverable
DRS	Document Review Sheet
EC	European Commission
EEA	European Economic Area
FP6	Framework Programme 6
FP7	Framework Programme 7
IP	Integrated Project
IRMOS	Interactive Realtime Multimedia Applications on Service Oriented Infrastructures
PM	Project Manager
PO	Project Officer
QoS	Quality of Service
SLA	Service Level Agreement
SOI	Service Orientated Infrastructure
SSAI	EC FP7 Service and Software Architectures, Infrastructures and Engineering unit
WG	SSAI Collaboration Working Group
WP	Work Package

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1. Executive Summary

Collaboration for the IRMOS project is in two distinct areas, within and without the FP6/FP7 funding framework. This document sets the ambitions of IRMOS in collaborating in these two areas along with the processes for determining the optimum use of IRMOS resources to maximise benefit both to the project and to the EEA.

As an Integrated Project (IP) the IRMOS project will take a lead role in the joint collaborative activity primarily centred around other projects approved for funding in the same call. This collaborative activity will operate on multiple levels from the sharing of technical know how through to training, dissemination and exploitation activities.

We will develop objectives for our involvement based on both the value we take from the work groups and the potential value IRMOS technology and exploitation opportunities we bring to the work groups. It is important that membership of any work group is based on mutual value with clear outcomes and scope of work defined at the outset. These objectives will be part of our internal process for deciding which work groups are appropriate for us to participate in. Once started the collaboration activity will be reported in formal reports as part of specific deliverables and also listed on the IRMOS web site www.irmosproject.eu

IRMOS is currently co-chair on two work groups:

- Virtualised Service Platform with Alcatel Lucent as our lead partner
- QoS & SLA with NTUA and Telefonica leading our representation

A scope of work has been defined and initial meetings are progressing to develop a more detailed work plan.

Beyond the immediate mandate of the Commission for all projects to participate within the EC framework up to at least 2% of grant there are other external opportunities for participation. These opportunities will arise at both a national and international level between commercial and academic partners involved in similar research. It is through this wider participation that the value of the project is amplified and European research realising its full value.

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2. Introduction

Objectives for this document

Within FP7 projects it is mandated to spend time and budget in collaboration with other FP7 funded projects. The primary aim of this document is to describe the mechanisms through which the project will determine appropriate collaboration options and the mechanisms for reporting the planning and execution of these engagements.

This document will undergo continuous update and so will be considered a living document until the end of the project. The aim of this is to ensure that changes in the ambitions of IRMOS and the engagement opportunities found may be documented in a coherent manner throughout the project. The timed deliverables will represent a snapshot of the document.

- D9.5.2 – Month 24
- D9.5.3 – Month 36

The engagement described consists of a number of routes, primarily through engagement with the collaboration groups set up by the EC and designed to foster co-operative working and results sharing. As an IP IRMOS is likely to be involved in many of these and this document sets out the process for selection and the involvement in them. In addition to the formal groups we recognise that there will be a number of opportunities for bi-lateral interactions between IRMOS and other FP7 projects. This document will set out the process for undertaking these engagements from the gaining of initial approval of the wider project team through to effective reporting of meetings and visits.

Alongside the mandated FP7 collaboration we acknowledge and encourage collaboration with other projects, funded by the EC, local & national governments and other sources. Again this document will lay out the processes for these engagements to ensure that there is no inappropriate activity and that the benefits of the IRMOS project remain within the EEA.

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3. Collaboration working groups

3.1. Objectives of collaboration group involvement

When engaging with collaboration working groups the IRMOS project aim is to ensure effective use of EC resources in reduction of duplicated effort between projects. We anticipate that this will come from the sharing of ideas and thoughts to foster mutual understanding, the sharing of opportunities for training and dissemination actions and appropriate re-use of material between projects when possible under the terms of our collaboration agreements.

Our engagement may be at any one of a number of levels and we expect the partners and the technical board of IRMOS to determine the best path for a given workgroup. Where appropriate we will take active steps to co-ordinate groups whilst recognising the significant time implications for the co-ordinators.

3.2. Process for group selection

Different levels of collaboration may take place between the projects:

- Concepts and Ideas: The collaboration takes place in terms of the exchange of ideas between the projects.
- Architecture, Design, Major Innovations: At this level, the projects not only exchange general concepts and ideas but also additional artefacts resulting from architecture definition and design concepts and other major innovative approaches.
- Software Components: Exchange of developed software components.
- Joint Developments and Demonstrations: The collaboration not only in terms of exchange of results but in terms of joint work, leading to developed components

The collaboration may take place at a different scale

- Bidirectional/multidirectional: mutual exchange of results between projects
- Unidirectional: just one project delivers its results to other(s).

The next table includes the current Collaboration Working Groups within the SSAI unit.

- New for FP7 of pre-existing:

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- In the case of the pre-existing groups, it is expected that some of the participant projects are coming from FP6 and therefore have some results available already. In this case, the type of collaboration may not be the exchange of ideas, but also the share of more advanced results such as architectural design and even software components.
- Between FP6 projects, the collaboration may already be occurring in a bilateral way.
- Between FP6 and FP7 projects it will be most likely unidirectional, in the direction of share of FP6 results towards FP7 projects.
- There is also the possibility that the new FP7 projects identify common interests in the topic and initiate a collaboration starting from the basic level of exchange of ideas.
- In the case of new collaboration groups the most probable situation is that the involved projects are also new and the collaboration therefore will take place in terms of sharing general concepts and ideas.
- Chairing working groups: every collaboration working group has a chair and a co-chair project. Their selection has been made based on the topic and the fact that the topic is one of the key areas within the project. These projects will lead the group, encourage the participants to share their results in an effective way and share their own results.
- IRMOS involvement:
 - (co)Chair: Chair or co-chair of the group
 - Participate: active participation in the group, with exchange of results with other projects (either unidirectional or bi/multidirectional)
 - Monitor: monitor the progress in the group in order to identify potential collaboration areas.
 - Undefined: not yet involved in the group, but do not discard to be in the future.

The main criteria to decide the level of involvement of IRMOS in the collaboration working group is the following:

- Relevant topics for IRMOS where the project plan to achieve major results and innovation: **Chair or Co-chair** of the group, if the position is vacant. Otherwise **active participation** is foreseen, with the intention to influence the group in the direction the project is progressing, the collaboration is going in more of a **unidirectional way**, from IRMOS towards the projects. Bi/multi directional collaboration is also welcome.
- Relevant topics for IRMOS where the project would like to reach a common understanding with the projects in the area: in this case an

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active participation is foreseen, and the collaboration in a **bi/multi directional** way.

- Topics addressed by IRMOS, but where the project does not have enough resources for deep research: **Participation** of IRMOS must take place, with the intention to request and receive input from those projects that we can invest more resources in the topic. A **unidirectional** collaboration from the projects towards IRMOS is foreseen.
- Topics potentially addressed by IRMOS in the future: The **monitoring** of the group is foreseen, by following the mailing lists (if any), meeting minutes and eventually attending the face-to-face meetings of the working group. A **unidirectional** collaboration from the projects towards IRMOS is foreseen. IRMOS will follow the status and progress of the group and decide on more active participation if the work is progressing in an interesting direction for the project.
- Topics not foreseen to be addressed by IRMOS: **Undefined** collaboration is planned in this case. Collaboration with this group will take place only in punctual cases where IRMOS is required or specifically informed about a topic of interest.

In the following table, a first attempt of the involvement of IRMOS in the collaboration working groups is made. This may change as the project and the different group's progress.

The existing Working Groups of the Grid Projects and their leaders are also listed below. If IRMOS wished to join them or collaborate the leader project should be contacted. Additional information on the activities of these groups can be found on <http://www.eu-ecss.eu/contents/technical-group/technical-groups/>.

In the next version of this document we will clearly define the collaboration group with whom we will participate.

<i>Group Name</i>	<i>New for FP7 or pre-existing</i>	<i>Chairing projects</i>	<i>IRMOS involvement¹</i>
QoS and SLAs	New	IRMOS SLA@SOI	Co-chair
Service Composition, SLA usage and	Pre-existing	BEinGRID	Participate

¹ Involvement is one of: (co)Chair, participate, monitor, undefined

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workflows			
Semantics	New		Monitor
Ontologies	Pre-existing	BREIN	Monitor/undefined
Service Engineering	New	COMPAS / DIVA / S-CUBE	Undefined
Formal methods for SOA and Future Internet	New		Participate/Monitor
Virtualised Service Platform	New	RESERVOIR / IRMOS	Co-chair
Virtual Organisations	Pre-existing	XtreemOS	Undefined
Service Front Ends	New	FAST	Undefined
Grid Portals and User Interfaces	Pre-existing	A-WARE	Undefined
Collecting Use Cases	New	S-CUBE	Participate
Service Architectures	New	NEXOF-RA / S-CUBE	Participate
Collaboration on Roadmaps	Pre-existing		Undefined
Grid Architecture	Pre-existing	NESSIGRID	Monitor
Trust & Security	Pre-existing	BREIN	Monitor/Participate
Data Management	Pre-existing		Undefined
Collaboration on Dissemination	Pre-existing		Participate
Repository	Pre-existing		Monitor/Undefined
Fabric & Monitoring	New		Undefined/Monitor
Joint Training Activities	New	S-Cube	Participate
Coordination of contribution to Standards	Pre-existing	CORE Grid / SLA@SOI / NEXOF-RA	

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3.3. Collaboration Groups co-chaired by IRMOS

3.3.1. Virtualised Service Platform

3.3.1.1. Group Scope

The scope of the Virtualized Service Platform working group for 2008 will be to:

- Define what is meant by a service, and determine the set of requirements a service must meet in order be supported. This will take into account envisioned future Internet trends such as sensors, RFIDs, "smart dust" etc. The output of this definition will give our vision on the difference between the "Internet of Services" and the "Internet of Things" as envisioned by the EC.
- Identify other FP7 stakeholders in a virtualized service platform and solicit their involvement.
- Formulate the non-functional requirements on a virtualized service platform from an application provider point of view.
- Formulate the non-functional requirements on a virtualized service platform from an infrastructure provider point of view
- Verify the set of requirement against contributed use-cases.
- Start working on a common definition of the interfaces required by service/application providers for lifecycle management.
- Examine the objectives of the other WGs (e.g. Architecture) to identify potential overlaps and points for collaboration.

3.3.1.2. IRMOS involvement

IRMOS is co-chairing the Virtualized Service Platform group. The first action undertaken by IRMOS (Klaus Satzke) was to produce a draft version of the WG's objectives and scope collaborating with the co-chair of the "Virtualised Service Platform" Working Group (Eliot Salant, RESERVOIR project). Later, a number of further action items have been identified:

- Contribution to the definition of the Collaboration Group's scope, involving all IRMOS partners
- Preparation of a brief description of the network virtualisation topic from the IRMOS perspective
- Further and ongoing action: preparation of slides for the refinement of the Collaboration Group glossary, scope and objectives definition towards the preparation of a presentation at the Concertation meeting in Brussels (22-23/9/2008).
- Out of this WG IRMOS partners ALUD/NTUA/USTUTT/IT-Innovation are preparing conjointly with partners from RESERVOIR a proposal for a

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networking session for Virtualized Service Platforms during the ICT event in Lyon November 2008.

3.3.2. QoS & SLA

The QoS & SLA is a newly created collaboration working group under FP7.

3.3.2.1. Group Scope

The objectives of the QoS & SLA Working Group are briefly drafted as follows:

1. Share mutual understanding of QoS & SLAs across various projects (terminology, functional and non-functional requirements, relevant standards & technologies). For example, what does "QoS" mean in SOI (QoS on different layers, vertical QoS issues, model-driven approaches to the QoS domain etc)?
2. Develop mediation framework that allows for translation between different perspectives. This framework refers to an annotated version of tables, which includes the following information:
 - Main terminology concepts
 - (Meta) models and views as supporting technologies
 - Artefacts with which SLAs are associated (e.g. business process, Web service, application container, DB, server, network, etc)

Metrics for assessing service level objectives / QoS

- Lifecycle issues
 - used standards
3. Drive joint initiatives towards broader communities (e.g. NEXOF-RA, Future Internet Assembly, standardization)
 4. QoS & SLAs: Identify the dependencies / barriers etc between QoS provision and SLAs
 5. Examine the role of QoS & SLAs in the Future of Internet (e.g. are the current SLA schemas able to serve the needs posed by the Future Internet trends - such as sensors)?
 6. Identify other FP7 stakeholders and check their involvement in this WG. Examine the objectives of the other WGs to identify points for collaboration.

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At this point we must mention that the aforementioned objectives are in a draft version and its final content will be decided through collaboration activities and exchange of comments between the projects that have already expressed their interest to participate in this new Collaboration WG.

3.3.2.2. *IRMOS involvement*

IRMOS is the co-chairing project of this group. Up to now a list of actions have been identified, begun to be implemented or planned for the future with the collaboration from other partners.

The first action undertaken by IRMOS (Dimosthenis Kyriazis) was to produce a draft version of the WG's objectives collaborating with the co-chairs from SLA@SOI Project (Wolfgang Theilmann, Tariq Ellahi) and circulate it to other projects. Moreover, a number of projects confirmed their participation in the WG and received the objectives document in order to make their additions/comments. These projects are Q-ImPrESS (Mircea Trifu), RESERVOIR (Eliot Salant, Juan Cáceres) and STREAM (Ricardo Jimenez-Peris). A reminder was also sent to confirm their participation to the following projects: COMPAS (Schahram Dustdar), OMP (Colin Tattersall) and SMART-LM (Josep Martrat).

Currently the ground for creating the infrastructure necessary for the WG is being prepared by Geir Horn (3S project).

There were some Collaboration Working Groups from FP6 related with this area: Service Composition, SLA usage and Workflow (TG3) and Business Models and Service Level Agreement (TG7). An action was set in order to check with this existing CGW if there are common objectives and if merging the working groups makes sense, taking into account the possibility to benefit from ongoing work and already created mechanisms, but also considering that the FP6 working groups will naturally end soon. There is a possibility of merging with previous TG3, and even in case the topics covered do not align completely, it is probably easier to have one WG dealing with SLA topics and have variable geometry subgroups (not formalised) to work on specific aspects: QoS, workflows, etc Once the objectives of this WG are reasonably stable, they should be circulated to TG3 as well. Merge with TG7 is foreseen to be less obvious.

Finally, the objectives of the QoS&SLA WG will be finalised and the corresponding research topics identified as well during the next Concertation Event (Brussels, 22-23/9/2008). This WG is allocated in the same time slot as existing WG in the area of

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SLAs (TG3 and TG7) and towards preparing this event, IRMOS is in contact with the chairs of these WGs in order to check if there are overlapping points between these groups and if a joint session in the Event will be of value for the WGs. The aim of the session is to present the objectives and to finalise an action plan for the CWG. It will also be advisable to have the session aims ready by the beginning of September (the very latest) so that they can be published in the session detailed agenda.

3.4. Collaboration Groups joined by IRMOS

As already identified in D9.4.3, a first contact has been made within the Collaboration Working Group on joint training activities mainly with the S-Cube project, which is the coordinator. These first contacts are mainly focused on investigating common areas of interest between the projects so that common training activities may be organized and personnel networking. An emphasis is also given to the way these activities will be implemented.

As identified in the WG, discussions are mainly focused on setting up a plan for the Collaboration Working Group. The main points of interest are

- Creation of a human network of contacts for the advancement of work
- Setting the goal of the WG
- Defining the process through which this goal will be achieved
- Time plan for the proposed actions

Up to now, people from S-CUBE have collected input from involved projects and are drawing up a set of topics suitable for common training activities. Investigation of common areas of interest between projects so that the topics of training activities are matched is very crucial for having an impact on targeted audiences and discovering common areas of interest. Furthermore the list of lecturers for these activities is in the process of being decided. The main means of accomplishing the training objectives for each target group are joint summer schools performed by instructors from involved projects and follow-up activities such as e-learning and virtual seminars.

Other projects involved in this group are NEXOFF, DEPLOY, SOA4ALL, Core Grid, COMPAS, OMP, RESERVOIR, PERSIST, SERVFACE, PROTEST, DIVA, MOST and OPEN.

IRMOS attended and gave a short presentation in the collaboration workshop on "Service Front End technologies in the future Internet of Services", organised by the

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FAST project, that chairs the Services Front End (SFE) Collaboration Working Group in FP7.

It was the first meeting and the CGW was introduced. Their first objective is to write a position paper for the next months. As the topic is, at least in the beginning, out of the main scope of IRMOS, a great implication from our project is not initially foreseen. However, some of the outcomes and trends of this WG can be taken into consideration, for example for the design of the tools and the modelling environment, for the specification of workflows, etc...

3.5. Future Internet Assembly

European ICT research supported by the EU 7th framework programme aims to develop key technologies for the Internet of the Future helping to sustain economic growth and improve social welfare of European citizens. To achieve this objective European Future Internet research has created a Future Internet Assembly (FIA) that has been structured according to five research areas Content, Networks, Security, Services and Things with an additional Testbed area for large scale experimental testing. The objective of the FIA is to identify, understand and resolve convergence challenges between these technology domains and to give Europe the lead edge over other competing global initiatives.

IRMOS has made significant contributes to the Future Internet Assembly (FIA) and IT Innovation a core member of the Internet of Services working group. IT Innovation attended the initial FIA meeting in BLED, Slovenia on 31 March 2008 and actively participated in the Services, Content, Security and Network sessions. IT Innovation presented convergence issues between content and services in the Content session showing how IRMOS is a key project addressing cross-cutting issues of the Future Internet. This was followed up by a meeting between at the EC between representatives from each area and collaboration leaders in the commission, which IT Innovation attended to help understand the flow of ideas between collaboration groups in the Unit and the FIA. IT Innovation has also published a report to the FIA IOS group on convergence issues and how to structure the FIA group to achieve greater impact and effective dialog.

IT Innovation has attended three FIA IOS teleconferences and discussed the original proposed cross-cutting topics from BLED, including:

- Architecture and Infrastructure
- Management and Governance
- Trust at scale and high granularity

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IT Innovation proposed a 4th topic on Lifecycle engineering for Future Internet Applications to begin dialog on vision and operation models for the future internet and a cross-domain dialog from engineering lifecycle perspective. The proposed topic is to look at a broader notion of engineering applied to services, content, things etc. that addresses the interplay between them through the various lifecycles they have and seeks to decouple these lifecycles from each other. IT Innovation has started discussion between Services and Networks and how lifecycle can be considered in the context of socio-economic issues that are currently examined. These issues are key to the success of IRMOS and ideally aligned so that IRMOS can benefit from this wider discussion and dissemination.

Finally, IT Innovation has accepted programme committee responsibilities for the ServiceWave2008 conference, a key event in the calendar of Future Internet activities.

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4. Other collaboration actions

4.1. Objectives of wider collaboration

The collaboration working groups work well to define a set of ambitions that cut across multiple projects and then to foster mutual co-operation and sharing of ideas in a multi-lateral manner. IRMOS also acknowledges that there are a number of additional benefits that may be obtained through bi-lateral collaboration activities. The key outcomes are similar to those for the collaboration groups however the collaboration can be deeper in nature as we believe that authoring appropriate mutual non-disclosure agreements on a bi-lateral basis will prove easier than for a full collaboration group. It is likely that these bi-lateral engagements will be directly between appropriate partners of IRMOS and the 3rd party rather than as a full project engagement.

IRMOS believes that engagement with non FP6/ FP7 funded projects will also allow us to leverage know-how that has been developed through other funding schemes. These engagements will be undertaken with a strict ambition of reducing the potential for the same work to be undertaken in multiple locations in isolation. In particular IRMOS is aware of a number of nationally funded projects operating within the EEA where there are complementary development activities. Through collaboration with these activities we will be able to provide a more complete solution to the IRMOS problem.

The geographic distribution of collaboration actions will be centred on the EEA, however the IRMOS project does not wish to restrict itself to this geography. There are many projects operating in other parts of the world that we will aim to maintain an awareness of whilst ensuring that there is no leakage of technology benefits from IRMOS to organisations outside the EEA. We acknowledge that this is a challenging ambition but there have already been projects elsewhere in the world that are complementary to the IRMOS project and where IRMOS may benefit from using their technical developments.

4.1.1. Desired inputs to IRMOS

- A participation in the Trust and Security group can be beneficial for IRMOS. Security is an important aspect of SOI's, however, the IRMOS project does not have the necessary resources to design and develop a complete security infrastructure. For this reason, inputs on this topic from other projects will be welcome.

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- Collaboration and Dissemination: Input on joint dissemination events within the SSAI unit will be of great interest in order to have a common place where projects with the same interests can disseminate their results. These joint events are a way to share logistics and preparation costs and to attract a bigger number and variety of attendees.
- Joint Training activities: The same as with dissemination, input on joint training activities within the SSAI unit will be of great interest in order to have a common place where projects with the same interests can teach about their results.
- Inputs on Semantics and Ontologies.
- Storage QoS: QoS on storage devices is a live topic of research in many research groups around the world. Other researchers have developed theoretical frameworks for QoS which IRMOS may be able to leverage into a working solution subject to appropriate intellectual property. In addition there have been 'heroic failures' where researchers have followed blind alleys, through engagement with these groups IRMOS will be able to avoid replication of this failed research work.

4.1.2. Potential outputs from IRMOS

IRMOS will strive in order to be part of collaboration activities. The benefits from this effort will come from identifying new partners and possibly new combined fields of technology or new implementations and areas of adaptation of IRMOS technology innovations.

For business partners one key objective is to investigate possibilities and partners for the implementation of IRMOS platform or subcomponents of it in other areas and other applications than the ones described within the project.

For academic partners the goal is to find common areas of interest with other groups and exchange knowledge and expertise on known issues regarding the topics dealt within IRMOS or investigate joint research activities inside this area or in subjects created by the union of components from different areas.

A number of interesting topics within IRMOS can be identified that could be used in collaboration activities:

Framework Services

- Software tools and associated modelling environments to enable real-time interactive applications to be written to target the IRMOS framework
- Specification languages that unify the various parameters and characteristics used to describe real time applications on SOIs, and allow value chain

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participants to collaborate in the design, deployment and execution of networks of services (also in accordance with the Execution Environment).

- SLA mapping process of application high level requirements to low level parameters (CPU cycles, memory, storage, network latency etc.)
- Reservation mechanisms for QoS provisioning (provided as a service)

Execution Environment (EE)

- Intelligent Storage Node
- Virtualisation techniques
- Real-time architecture of EE
- Mechanisms for Fault Tolerance (life migration etc.)
- Reservation mechanisms for QoS provisioning (provided as implementation)

Intelligent Networking

- Network overlay enabling automated SLA negotiation and monitoring to enable delivery of QoS assurances as required by Real-Time interactive applications
- ISONI and general network mechanisms (addressing, path supervision, flow control architecture)

Collaboration opportunities can arise also from the Standardisation activities carried out by IRMOS since the beginning of the project, which brings the ability to cooperate with a variety of specialists, thus benefiting from their collective expertise. IRMOS will also explore the participation in the "Coordination of contribution to Standards" CGW [1], as IRMOS shares the WG mission and goals. With so many different and potentially parallel standardisation activities, it is important to have a joint strategy to co-ordinate FP7 efforts to strengthen European collaboration and to increase the impact of European standardisation activities on the world stage.

- General SOI architecture
- Network virtualization
- Addressing schemes for service isolation to avoid unwanted crosstalk
- Network resource management to deliver real-time QoS assurances.
- Path supervision for monitoring and SLA violation reporting on network level
- Policing of individual service overlays to guarantee the required level of QoS for co-existing service overlays on a shared transport medium
- Providing means for technical SLA negotiation for the network part of the SOI architecture approach

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4.2. Other EC funded projects

The main focus should be on projects with similar time plan like IRMOS. This means that we must concentrate mainly on FP7 funded projects. Similar ones in comparison to IRMOS are:

- **STREAM** (Scalable Autonomic Streaming Middleware for Real-time Processing of Massive Data Flows): A growing number of applications require the ability to process massive amounts of streaming data in real time: for example fraud detection in cellular telephony, security for enterprise networks, automatic trading, processing of the output of large scale ad-hoc networks, etc. Stream aims at providing a highly scalable middleware platform to enable a new breed of such applications. Stream's real time requirements meet IRMOS target of providing such QoS guarantees.
- **NEXOF-RA**: NEXOF-RA aims to build the Reference Architecture for the NESSI Open Service Framework (NEXOF), leveraging research in the area of service-based systems, and to consolidate and trigger innovation in service-oriented economies.

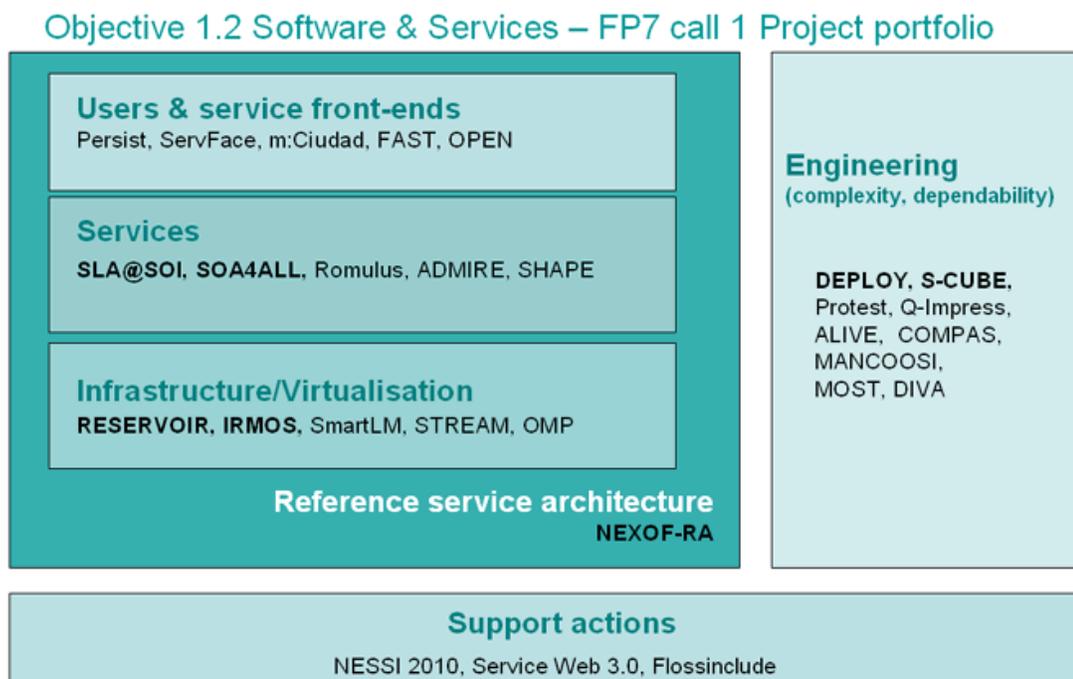


Figure 1: Overview of the first batch of Seventh Framework Programme (FP7) projects of objective 1.2 'Services and Software Architectures, Infrastructures and Engineering' [2]

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For further collaboration opportunities IRMOS will participate in the Internet of Services Concertation meeting. This is a meeting for FP6 and FP7 projects in the area of Software & Services, Grid and Software and Service Architectures and Infrastructures, held in Brussels during the 22nd and 23rd of September 2008, which has the goals of:

- Raising the impact of the results of individual projects through networking, sharing experiences and participation to collaboration activities.
- Coordination of the activities for the next year of the Collaboration working groups.
- Presenting results from already running projects through posters and demos, in order to get more take up of results and collaboration
- Sharing best practices through interactive round table sessions on
- Open Source in FP projects,
- Exploitation of R&D results obtained in FP projects,
- International cooperation
- Providing information about the "Internet of the Future" and the "Future Internet Assembly (www.future-internet.eu)", and defining further a concrete action plan on possible contributions to the Future Internet Assembly

IRMOS can also target projects that are not inside the SSAI sector, especially the ones that have to do with media and networks, due to the fact that IRMOS use scenarios cover areas such as Virtual Reality and eLearning so the platform with its real time guarantees can be used as an infrastructure for media applications. IRMOS can collaborate with these projects through exposing functionalities of the platform and especially the integration of applications on this. For this aim the sector of Networked Media is the most appropriate one. Indicative projects from this with interest for IRMOS are:

- 3DPresence: The 3D Presence project will implement a multi-party, high-end 3D videoconferencing concept that will tackle the problem of transmitting the feeling of physical presence in real-time to multiple remote locations in a transparent and natural way.
- My-e-Director 2012 (Real-Time Context-Aware and Personalized Media Streaming Environments for Large Scale Broadcasting Applications): The main idea of My-e-Director is to research and develop a unique interactive broadcasting service enabling end-users to select focal actors and points of interest within real-time broadcasted scenes. The service will resemble an automated ambient intelligent director that will operate with minimal or even without human intervention.

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Due to the fact that there is a vast number of projects to which we are not aware whether IRMOS products will be useful, in order to investigate other collaboration potentials IRMOS could participate in one of the Networked Media Sector's events in order to disseminate its goals and vision or to other events gathering the entire area of EU funded projects such as the Future Internet Assembly.

- **RESERVOIR** (Resources and Services Virtualization without Barriers): The goal of the RESERVOIR project is to increase the competitiveness of the EU economy by introducing a powerful ICT infrastructure for the reliable and effective delivery of services as utilities. This infrastructure will support the setup and deployment of services on demand, at competitive costs, across disparate administrative domains, while assuring quality of service.
- **SmartLM** (Grid-friendly software licensing for location independent application execution): Current software licensing practices are limiting the acceleration of Grid adoption. The rapid emergence of service and virtualization environments requires a rapid evolution in licensing models. SmartLM aims at providing a generic and flexible licensing virtualization technology for new service-oriented business models across organization boundaries.

IRMOS is also aware of other EC funded projects that are likely to be of relevance to IRMOS and with which collaboration may well be useful. These include:

- **SHAPE**: The SHAPE project aims to support the development and realization of enterprise systems based on a Semantically-enabled Heterogeneous service Architecture (SHA). SHA extends Service Oriented Architectures (SOA) with semantics and heterogeneous infrastructures (Web services, Agents, Semantic Web Services, P2P and Grid) under a unified service oriented approach. To achieve this the consortium of the SHAPE project will develop a Model-Driven Engineering (MDE) tool-supported methodology and will take an active role in the standardization of metamodels and languages for SHA. The project is co-funded under the IST 7th Framework Programme (ICT-2007-216408) <http://www.shape-project.eu>.
- **MODELPLEX**: Model-driven engineering (MDE) is an approach to Software Engineering that has proven benefits of cost reduction and quality improvement. Although Models can indeed provide the necessary abstractions that enable human comprehension, communication, simulation and analysis, and synthesis of implementation artefacts which is key for complex systems engineering, applicability still remains a challenge. MODELPLEX will define and develop a coherent infrastructure specifically

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for the application of MDE to the development and subsequent management of complex systems within a variety of industrial domains. The project is co-funded under the IST 6th Framework Programme (contract number 034081) <http://www.modelplex.org>.

4.3. National level projects

IRMOS will strive to investigate collaboration opportunities with projects funded from the Hellenic State. The main contacts will be performed through the General Secretariat of Research and Technology and mainly its sub-department, the National Documentation Centre [3], which is also the coordinator of the Hellenic Innovation Relay Centre, a member of the European IRC Network, aiming to the promotion of innovative technologies and services, and the facilitation of international technology transfer agreements. Through this bureau collaboration possibilities with other national funded projects can be discovered and implemented.

In Spain, the main national level projects are promoted by Centre for the Development of Industrial Technology (CDTI) [4], under the Ministry of Industry, Tourism and Trade, whose objective is to help Spanish companies to increase the technological profile of said companies. The main programme is called CENIT and it provides for the financing of major integrated projects for industrial research of strategic nature, large size and long term scientific and technical scope. TID takes part in several CENIT projects as the biggest private company dedicated to R&D in Spain. TID will explore the possibilities of collaboration with projects and initiatives at Spanish national level in those areas of interest for IRMOS.

SOA i Praksis (NO): This Norwegian project (SOA in practice translated) is a networking project where leading practitioners and researchers in the area of SOA take part. The goal is to exchange knowledge and experiences and drive research in the appropriate direction.

In Italy, the main national level projects are promoted and funded by the Italian Ministry of Education, University and Research [5] (MIUR). Various types of projects with different funding schemes are supported, among which the following are particularly worth to mention:

- funding of industrial/applied research (FAR)
- funding of basic/fundamental research (FIRB)
- funding of nation-wide interesting projects (PRIN)

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We could identify a few projects that might have some relevance for the purposes of collaboration activities with IRMOS:

- PRIN projects approved in the 2006 selection batch, in the area of industrial and computer engineering
 - *“NADIR (2007-2009): design and performance evaluation of distributed protocols and algorithms for mesh networks with Quality of Service”*, was *“progettazione e valutazione delle prestazioni di protocolli e Algoritmi Distribuiti per Reti mesh con qualità del servizio”*, lead by prof. Luciano Lenzini at University of Pisa;
 - *“Methods and tools for migration of software systems towards service-oriented web architectures: experimental, evaluation, usability and technological transfer”*, was *“Metodi e strumenti per la migrazione di sistemi software verso architetture web e orientate ai servizi: valutazione sperimentale, usabilità e trasferimento tecnologico”*, lead by prof. Andrea De Lucia at University of Salerno;
 - *“PUODARSI: User-oriented product development based on interactive augmented reality and simulation”*, was *“Sviluppo prodotto orientato all’utente basato su Realtà Aumentata e simulazione interattiva”*, lead by Prof. Monica Bordegon at Polytecnic of Milan.

In the context of high performance and GRID computing, it is worth to mention the INFN Grid project [6], that is the general container used by INFN – Italy’s National Institute for Nuclear Physics – to develop and deploy the Grid middleware services which allow its various user communities to transparently and securely share the computing and storage resources together with the applications and technical facilities, available in the different administrative domains of the various Institutions and geographical sites.

4.4. Collaboration with the wider world

IRMOS will collaborate with non EEA projects where there is mutual benefit from so-doing. This engagement is likely to be a lightweight ‘monitoring’ and exchange of public domain information but may extend further.

The following levels of engagement have been determined:

- **Monitoring:** Partners within IRMOS will be free to discuss public domain information from IRMOS with projects outside the EEA in return for which we expect the non-EEA project to discuss and describe its public domain information. The benefit of opening discussion comes from the additional description around the public information. Since this process is part of normal scientific endeavour it will not be subject to approval by the IRMOS technical committee.

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- Partner level bi-lateral: Partners within IRMOS will be free to discuss IP that they have both developed within IRMOS and have full ownership of with non-EEA collaborators. In return for this IRMOS partners expect to be given similar levels of access to information. It is important to note that the IP of other partners within IRMOS is not available for discussion although the 3rd party collaborator will need to be aware of the potential for high level discussion of their IP with the wider IRMOS consortium. This type of engagement will be discussed and minuted in the technical committee calls prior to its commencement. Partners wishing to engage in this type of interaction will be encouraged to consult the IRMOS collaboration agreement to ensure that all terms are adhered to.
- Full engagement: There may be occasions when the IRMOS project can benefit from a full, formal, engagement with a project not located within the EEA. These benefits may include the fostering of inter-operability of solutions and the opportunity for exploitation of IRMOS technologies. This type of engagement inherently carries the risk of technology benefit leak to locations outside the EEA. As such this type of engagement is subject to steering board approval.

At the current time no organisation has been identified outside the EEA with which IRMOS will collaborate however this set of guidelines will enable partners to make appropriate judgements as and when appropriate opportunities arise.

4.5. Process for identification

All partners are encouraged to maintain an awareness of the world-wide context of their work. This enables partners to identify other research efforts that have relevance to them. In addition partners are encouraged to regularly assess the EC funded project landscape for new and existent projects where there may be mutual benefit from collaboration.

When a partner identifies an opportunity for collaboration they will:

1. Write a description of the opportunity including the type of opportunity and the proposed level of engagement. This will be uploaded onto the project workspace (BSCW).
2. Inform the technical manager of the project that there is an opportunity to discuss on the next technical steering group call. If the opportunity is associated with a tight deadline there will be the option of requesting that a special call is convened to discuss the opportunity.

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In its discussions the technical committee will consider:

1. Technology advancements that accrue to IRMOS
2. Level of engagement requested
3. Potential for cost reductions for dissemination or training
4. Potential for creation of an exploitation route
5. Cost of engagement in terms of both financial commitment and technology fed into the opportunity

The recommendation of the technical board will be one of the following:

1. Stop engagement with the potential collaborator(s)
2. Collect specified further information and return to the technical committee
3. Progress with collaboration as requested
4. Progress with collaboration with an alternative level of engagement (note that this may be lesser or greater than the originally suggested level of engagement)

If the partner identifying the opportunity is in disagreement with the decision of the technical committee they shall have the right and opportunity to raise an issue with the steering board. The steering board will consider the opportunity using the same criteria and their decision will be binding (subject to conflict resolution guidelines as stipulated in the consortium agreement).

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5. Reporting of Collaboration activity

As already identified in D9.1.2 “Initial Dissemination & Exploitation Plan” [7], the project’s involvement must be based on both the value extracted from the work groups and the potential value IRMOS technology and exploitation opportunities brings to the work groups. Mutual value and clear outcomes and scope must exist in order to justify the benefit of the participation in this activity.

About 20 days prior to the meeting, involved partner should inform the consortium about the event, its purpose and what is expected to be presented as contribution. Possible benefits also derived from this meeting could be helpful. Agreement of the Consortium on the content presented should be pursued. Especially this should be implemented when sharing of technical know-how takes place and it concerns more than one partner’s involvement in the project.

With respect to each Collaboration Group, an IRMOS “collaboration proxy” per individual Working Group shall be identified in order to ensure that IRMOS always speaks with one IRMOS voice with the respective collaboration group.

After the event, a brief description of the collaboration activity that took place will be given in order to be included in according deliverables and reports and in the project website possibly. This description will contain details on the activity (time, place, involved parties). Furthermore it will contain references and details about the information published under the IRMOS logo (e.g. presentations). Another topic that should be covered is the results of this activity, problems stated and conclusions reached and possible action items that are produced from it.

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6. References

- [1] European Community for Software and Software Services –
<http://www.eu-ecss.eu/contents/technical-group/co-ordination-of-standardisation-efforts/ct3-2013-co-ordination-of-standardisation-efforts/>

- [2] CORDIS:ICT: Programme: Service and Software Architectures, Infrastructures and Engineering - http://cordis.europa.eu/fp7/ict/ssai/projects_en.html

- [3] National Documentation Centre – Greece <http://www.ekt.gr>

- [4] The Centre for the Development of Industrial Technologies – Spain
<http://www.cdti.es>

- [5] Ministero dell'Istruzione dell'Università della Ricerca -More information is available (in Italian) at the URL: <http://www.miur.it>

- [6] INFN Grid – The Italian Grid Infrastructure - More information is available at the URL: <http://grid.infn.it>.

- [7] D9.1.2 “Dissemination & Exploitation Plan”