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Executive Summary

The SLA@SOI project has begun to contribute significantly to the state of the art in Service Level Agreement aware Service Oriented Infrastructures. To maximise the impact and outreach of the results of the project, dedicated resources have been assigned to dissemination.

This Interim Dissemination Report has been compiled to document all dissemination activities to date, and also introduce current plans for the remainder of the project. It builds on the experience of all the partners in the project, and has also been influenced by the EU guidelines\(^1\) on Dissemination and Communications.

The document first describes the context for dissemination within SLA@SOI. Objectives, strategies, a stakeholder and communication channel analysis and summary of dissemination processes are all included.

This is followed by a comprehensive list of dissemination support work undertaken, and by a summary of all the dissemination activities that have been undertaken including publications, events, collaborations and standards. Highlights have included the interest in our blog posts, the participation at the NESSI Summit and FIA Valencia, and acceptance for publication at important academic conferences including QoSA, CAiSE, AREAS and ICE-B. Important progress was also made in the area of standards, in particular with OGF’s OCCI, WS Agreement and WS Agreement Negotiation. The results of these efforts can be seen in growing external interest in the project, with increasing page hits on the website and SLA@SOI featuring in a list of top 250 cloud projects\(^2\) (it also appeared there last year when just 150 projects were included).

The document concludes with a chapter describing dissemination plans. This includes a description of key lighthouse events that are being lined up - the SLA@SOI Information Day in September 2010 being a key event.

This document is an extensive update of the Dissemination Plan prepared for Month 12 of the project and will continue to be revised and extended as the project progresses.

\(^2\) [http://jeremygeelan.ullitzer.com/node/1386896](http://jeremygeelan.ullitzer.com/node/1386896)
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1 Introduction

The success of the SLA@SOI project will not be measured by just the quality of its scientific research and technical implementations, but also by the breadth and depth of the dissemination of these results. The sharing of the goals, research activities, opportunities to collaborate and results of the project is perhaps as important an output as the results themselves.

This document describes the context for dissemination in the consortium in terms of objectives, stakeholders and strategies, the dissemination strategies adopted, the support given for dissemination, the dissemination activities to date and the plans for dissemination in the remainder of the project. All partners are participating in dissemination activities, driving and engaging with those of most relevance and interest to them. Dissemination activities have been coordinated by Intel, the dissemination lead, and have been guided by the commitments in the Description of Work (DoW), the evolving experiences of the partners in the consortium, the success of dissemination activities to date and the learnings shared in the EU Guidelines on Dissemination and Communications[3].

This document has its foundations in deliverable D.B9b Dissemination Plan [1], and is closely related to work described in deliverables D.B8a Exploitation Plan [2] and D.B8c Annual Review of External Collaborations [3].

This document is organised as follows:

- Section 1 – Introduction introduces the SLA@SOI Interim Dissemination Report and provides this brief document outline.
- Section 2 – Dissemination Context describes the SLA@SOI dissemination objectives and strategies, profiles key dissemination stakeholders, maps them to key communication channels, and summarises the dissemination processes that have been put in place to support this importance work package.
- Section 3 – Dissemination Support summarises the tools and processes that have been put in place and the ongoing support that has been supplied to dissemination activities to date in the project.
- Section 4 – Dissemination Activities summarises the dissemination activities that have been undertaken to date to raise awareness to the external audience. Publications, Events, Collaborations and Standards are all presented.
- Section 5 – Dissemination Plans describes the plans for dissemination in the third and final year of the project.
- Section 6 – Conclusion provides a brief summary of the previous sections in this document.

2 Dissemination Context

This chapter describes the objectives of dissemination in SLA@SOI, the dissemination strategies adopted, the stakeholders identified as being of particular significance, the channels through which they can be communicated with and the processes set up to effect successful dissemination.

2.1 Dissemination Objectives

The objectives of the dissemination work-package in SLA@SOI as defined in the projects description of work are:

- To establish a shared and efficient process to help identify, develop, review and make available, content which communicates the objectives and results of the activity in the project;
- To provide a process which identifies and checks for new external dissemination target audiences, and coordinates targeted engagements as appropriate;
- To facilitate dissemination activities by sharing templates, methods and tools in order to enable efficient communication. The tools and techniques to facilitate dissemination within the consortium and outside it are listed and described later in this document;
- To identify and check for new target audiences;
- To communicate project results to relevant stakeholders via various channels, in particular via the project web site;
- To generate project collateral for general use, for example brochures and posters, that project partners can bring to external events such as workshops and conferences;
- To create and increase external awareness.

The intent of these dissemination objectives is to ensure a broad awareness of the activities and results of the project, and to facilitate the project’s closely related collaboration and standardisation initiatives. Together they all help maximise the exploitation of the project.

Dissemination is recognised as being of strategic importance within SLA@SOI and although led by Intel, all partners are contributing to the actual dissemination activities themselves.

2.2 Dissemination Strategy

In order to meet the objectives described in a coherent fashion a dissemination strategy was required. Following consultation with all partners via a questionnaire, consideration within the Dissemination and Exploitation work packages jointly, and deliberation within the Project Management Team, the following high-level consortium wide strategy was established.

1. Stakeholders were to be identified;
2. Appropriate Communication channels were to be identified and established;
3. Appropriate dissemination processes were to be put in place;
4. Support for dissemination activities was to be provided;
5. All partners were to engage in the Dissemination activities themselves;
6. The strategy, processes and activities were to be monitored on an ongoing basis and regularly reviewed.

To support this strategy the separate Exploitation, Dissemination and Collaboration and Standardisation tasks began working closely together right from the project inception. Dissemination reports were compiled approximately every six months and dissemination activities were reviewed and planned at a project-wide level at the typically fortnightly Work-package Leadership Board meetings, and in a higher-level way at Project Management Team and dedicated out-of-cycle meetings.

The consortium has taken an integrated approach to dissemination, using shared resources and consistent processes and interfaces. The vast majority of the project output is designated ‘open’ and is therefore a candidate for dissemination. Some prioritisation has been applied to select the most appropriate and useful dissemination target communities and sectors, in Europe and globally. This integrated approach has included templates, guidelines and approval processes on one side with a communication platform, publication, event participation and release plans on the other.

Overall project outputs selected as being key dissemination artefacts include:
- The open-source SLA framework which allows for reusing developed technologies;
- The various industrial use-cases and evaluation reports;
- The open reference case which allows for easy demonstration but can be also used by external stakeholders to cross-check project results or even modify and extend certain features of the solution;
- The scientific and industrial assessment reports which will allow external stakeholders to precisely understand the conditions under which the project results can be successfully exploited.

In addition, the consortium is extensively communicating specific innovations and research results as the project progresses, via, in particular, paper submissions to academic conferences and publications, and technical blog posts.

Complementing and feeding into this overall consortium strategy are partner-specific dissemination strategies. Initially captured by questionnaire, updated descriptions of these strategies are presented in Appendix D: Partner-Specific Dissemination StrategiesAppendix C: Dissemination Publications. Although potentially more difficult to manage, having a large consortium of twelve partners spanning industry, research and academia spread throughout Europe, each with their own established network, opens additional opportunities for dissemination which benefit the entire consortium.

Before disseminating it is important to know and to understand the audience. An analysis of key stakeholders for SLA@SOI is provided in the following section.

### 2.3 Dissemination Stakeholders

One of the objectives of the dissemination activities is to create and increase project awareness amongst all target groups. In general terms, a stakeholder is anyone who has a vested interest in the project. Stakeholders or target audiences are the people that the project is attempting to reach. Different stakeholders have different experiences, challenges, goals and constraints, and in order to communicate effectively with them it is important to both identify the types of stakeholders, and understand their needs.
A questionnaire of the consortium partners together with a literature review has resulted in the following key stakeholders being identified to date. This list is not exhaustive and indeed there is some overlap between roles, however stakeholders can approach SLA@SOI from any of these perspectives and so they all need to be understood and considered.

- Service Consumers
- Service Providers
- Service Provider Suppliers
- Business Managers
- Business Analysts
- Software Architects
- Software Developers
- Researchers
- Students
- Standards Organisations
- Policy Makers
- Journalists

These identified stakeholders are individually explained in the following sections. The stakeholder description, their potential influence and most relevant communication channels are all summarised.

### 2.3.1 Service Consumers

Service Consumers are perhaps the most important stakeholder in SLA@SOI because it is they that typically pay for the services that are consumed. It is largely this potential for the revenue that attracts service providers, and consequently the interest and attention of all the other downstream stakeholders.

Different service consumers will have potentially different needs, and so service providers that can most cost-effectively meet the individual customer’s particular functional and non-functional requirements will typically attract the business.

In terms of dissemination channels, customers do not typically care about technical implementation details and so there is no immediate need foreseen for SLA@SOI to attempt to disseminate directly to them. However, once service consumers understand the advantages of negotiating a precise service provisioning they may be more attracted to service providers that have gone to the effort of SLA-enabling their infrastructure. Reassurance schemes covering topics such as online payment security, privacy policies, anti-virus scanning and browser compliance have all proven popular in the internet age. Perhaps some form of “SLA-aware” moniker will help reassure and attract potential service consumers to service providers in the years to come.

### 2.3.2 Service Providers

Service providers will SLA-enable services if they see the business value. This may be achieved by attracting additional consumers, or by reducing the internal costs of offering the service.
Once convinced of the value of SLA-enabling their offerings, service providers will realise and drive the widespread adoption of this approach.

To convince service providers of this value, however, requires clear unambiguous dissemination materials that can reassure them of the power, flexibility and maturity of the system, inform them of the investment required, and illustrate the potential for real business impact. Ideally these materials, online or more traditional, would be based on the results of grounded real-world use case deployments.

### 2.3.3 Service Provider Suppliers

Service Providers that decide to pursue and SLA-enabled approach will need to be able to offer their services on SLA-enabled infrastructure. This infrastructure may be self-built, or may depend on third-party components. The suppliers of these components may need to adapt their products to better support SLA-enabling. Additional configuration and flexibility may be required, better support for dynamic management may be necessary, and instrumentation and monitoring may need to be improved.

Service Provider Suppliers that successfully respond to these evolving needs of their customers, the Service Providers, will have a better chance of succeeding in business. And once they implement the initial support for SLA-enabled services, other Service Providers that use their products will also be able to benefit from this approach.

Service Provider Suppliers thus need to clearly understand the SLA-enabling concept, and the fundamental requirements this may place on their customers, which they in turn can strive to help them meet. Whilst the implications for each Service Provider Supplier will of course depend on the products they supply, clear details of reference deployments in the same or similar industries will help clarify the overall concepts and the particular ways in which Service Provider Suppliers can respond.

### 2.3.4 Business Managers

Business Managers refers to people with responsibility for running a business or part thereof, and have at least some control over where their budget and resources are targeted in order to meet and exceed their business goals.

If Business Managers identify the potential for significant improvements to their business with the introduction of technologies and approaches such as offered by SLA@SOI, they will encourage or indeed mandate their software architects and developers to pursue this approach as appropriate. Without business manager approval, the integration of SLA@SOI technology is unlikely as software architects and developers would be given other priorities by their employers.

Dissemination materials that would benefit Business Managers would include anything that clearly describes and demonstrates real-world benefits secured by introducing SLA@SOI in real-world deployments. Such materials could include videos, animations, briefing sheets, interviews and business articles online and in the printed (business-oriented) media.
2.3.5 Business Analysts

Business Analysts typically marry business processes to appropriate technical implementations and processes, constantly pursuing the most efficient, practical and effective way of meeting the business needs, and looking for opportunities to maximise profit and minimise cost.

Business Analysts have in-depth business knowledge, but are also technically savvy. Once aware of the value of a change to their technical infrastructure, environment or procedures, they can translate this into the business value that senior business managers and other decision makers will understand.

Business Analysts appreciate high-quality high-level information on technologies that at the very least illustrates the potential business impact. Details of successful applications in grounded use-cases in similar domains will be of great interest to them. They will also need to gain an understanding of the deployment specific configuration, customisation and integration effort required before satisfying themselves of the usefulness of a new approach.

2.3.6 Software Architects

Software architects design the structure of large and small scale software implementations. They need to consider the user requirements, technical context and all constraints on the project before architecting a solution and designing a software implementation. They may specify the operating systems, middleware and third-party libraries to be used as well as the design of the software to be developed.

Software Architects are technical decision makers and will rule in or out whether third-party architectures, models and components such as those developed by SLA@SOI are applied in their projects.

Software Architects will appreciate comprehensive online documentation, including high quality technical overview material that quickly explains the scope and functionality of the software, model or approach being promoted. They will also be interested in the quality and maturity of the third-party material, as well as any evidence of timely support being available.

2.3.7 Software Developers

Software developers are the people who will actually consume the software and models generated by SLA@SOI. They may be students, hobbyists, self-employed software professionals or working for an SME, multinational or public sector organisation.

If dissemination materials do not stimulate software developers sufficiently, or do not support them or give them confidence in the project’s software then it is unlikely that SLA@SOI will be successfully applied outside the consortium – developers will simply seek alternatives.

Whilst there are many software development platforms and languages, SLA@SOI by its nature is most immediately appropriate to enterprise developers – developers of services. These developers are typically familiar with Service oriented Architectures in general and Web Services in particular, and are comfortable exposing services via the internet using languages such as Java *, .NET * or PHP.
Many will be familiar with open-source stacks that could include Eclipse*, Apache*, Linux* and MySQL*.

Software Developers typically appreciate comprehensive online documentation including install guides, cheat-sheets, FAQs, interface descriptions and detailed specifications. Active online support (be it provided by the software publisher or an active online community) is an important consideration and facilities such as discussion boards, ticket trackers, and wikis are important resources which software developers have come to expect.

### 2.3.8 Researchers

Researchers are typically concerned with progressing the state of the art in their domain of interest. Of course, these domains and the research being undertaken needs to be of sufficient interest to private or public people or organisations to secure necessary funding.

Typically cautious and deliberate, if a suitably rigorous body of work is introduced in their domain of interest researchers will consider developing the research further themselves, or integrating it with other research that has not be previously considered. Researchers play leading roles in developing novel commercial products, defining international standards and advancing the technology on which society depends.

Researchers need to be confident of the quality, completeness, and flexibility of a body of work before giving it serious consideration. Detailed technical information and formal publications, ideally peer-reviewed and disseminated through high profile academic and scientific channels, are fundamental prerequisites. Appropriate conference presentations and workshops are also valuable dissemination tools.

### 2.3.9 Students

Students of particular topics are generally interested in all relevant developments in that area including underlying theories and the application of them in practice. They can then form an opinion on what solutions can best be applied to challenges that may arise – hypothetical during their education, or in the real world post graduation.

Students need high-quality, unambiguous information that clearly explains the context and scope of the area being studied. In the case of a technical project such as SLA@SOI, they should also be provided with examples of how the project outputs have been applied to solve real world problems, and be supplied with enough tools and information to apply the outputs to other problems themselves.

### 2.3.10 Standards Organisations

Standards Organisations are interested in creating and improving standards that facilitate the parties participating. Typically they introduce enough stability and consistency into a domain so as to minimise integration issues for users, allow multiple parties interoperate consistently, and potentially open up new business opportunities.

If submissions to Standards Organisations are sufficiently detailed, complete and holistic, they may be accepted as drafts for new or enhanced standards. Becoming
an industry standard encourages all players in the industry to implement the standard, assuming there is commercial value.

Dissemination materials targeted at standards organisations must be of very high quality, and extremely detailed. Ambiguity should be avoided. The standards proposed should also be generic and holistic enough to encourage widespread adoption and avoid favouring particular companies or institutions.

### 2.3.11 Policy Makers

We define Policy Makers as being those that make policy decisions, typically in a senior political or public administration type role. They may operate at a local, national or indeed international level (e.g. European). They may or may not be domain specific. They are typically elected to office, or may be appointed or directed by elected representatives.

Policy makers typically have substantial power and may control the direction of public-funded research and even, through legal instruments, may explicitly mandate the adoption of particular directions. They define policy on behalf of those citizens they govern.

Policy makers typically operate at a high level and need to quickly understand the impact of implementing any proposed policy changes. The impact of the proposal should be clearly explained in high level terms, with any potential ramifications for other stakeholders outlined. The advantages for citizens, end-users and industry of the policy change should be immediately apparent.

### 2.3.12 Journalists

Often working to tight deadlines, journalists investigate and report on news of potential interest to their readership. Their audience may be limited to a particular region or country, and may be targeted at a particular group of stakeholder: business management, software architecture, or indeed the general public: service consumers.

Journalists can share messages widely and effectively, speaking in the language of their readership and grounding the messages in a wider context.

Journalists benefit from a variety of dissemination materials. Certainly concise high level content is useful to give a high level understanding, but depending on the article and readership in question, detailed information may also be important. High quality graphics should also be made available. In order to give articles a unique perspective, personal interviews and statements are often worthwhile.
2.4 Dissemination Channels

Dissemination channels need to attract, satisfy and ideally maintain the interest of dissemination stakeholders. The list of potential channels is continuously growing as new ways for communicating become established, however the following online, conventional and in-person dissemination channels are considered relevant for SLA@SOI:

Dedicated Online
- Project Website
- Sourceforge Website
- Blog
- LinkedIn
- Twitter
- Multimedia
- Email

Conventional Media
- Press Releases
- Brochures
- Newsletters
- Posters
- Flyers
- Presentation materials
- Academic Papers
- Publications

In-person
- Academic Conferences
- Workshops
- Seminars

Having briefly introduced dissemination stakeholders in the previous section, the following table maps these different target groups with corresponding dissemination channels. The red colours highlight the deep into detail the technical and business materials should delve. The green colours indicate how important the dissemination channels can be considered for the given stakeholder. Furthermore, the darker the colour the higher the importance of the dissemination channel for the respective stakeholder. Yellow denotes not usually of importance.
This mapping highlights for example that in-depth technical information is of significant importance to software architects, developers, research, students and standards organisations. Business depth is important for business management, analysts, students and journalists.

Looking at the various dissemination channels considered, it can be seen that the website is considered significant or very significant for all potential stakeholders, whilst presentations, publications, workshops and seminars are considered similarly important for all but service consumers.

This (ongoing) analysis is helping identify dissemination priorities so that dissemination resources are being used most effectively.

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**Figure 1: Indicative mapping of Stakeholders to Dissemination Channels**
2.5 Dissemination Processes

The following dissemination processes have been set up to help fulfil the project objectives. All dissemination processes are supported by appropriate pages or groups of pages within the internal consortium wiki.

**Table 1: Dissemination Processes**

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<tr>
<td>Coordination of Exploitation – Collaboration – Dissemination and Standardisation Tasks</td>
<td>Designed to maximise efficiencies and opportunities, the exploitation, collaboration, dissemination and standardisation task leaders all meet periodically offline and with the entire consortium in plenary at consortium meetings to share current status and synchronise plans. Any additional stakeholders brought to our attention are discussed and considered.</td>
</tr>
<tr>
<td>Work-package Leadership Board Meetings</td>
<td>Meeting regularly, typically fortnightly, all partners are represented at this meeting and any topical dissemination plans or initiatives underway are dispositioned and discussed.</td>
</tr>
<tr>
<td>Event Tracking</td>
<td>This ongoing process provides a centralised way for all events the consortium becomes aware about to be captured and tracked – in a wiki page. A dedicated template has been created so that relevant event details are captured, and the dissemination lead is informed so that any necessary support can be arranged.</td>
</tr>
<tr>
<td>Publication and Presentation Tracking</td>
<td>This ongoing process provides a centralised way for all publications and presentations to which the consortium partners are contributing to be captured and tracked – a wiki page and associated tracking spreadsheet being provided for this purpose. Publication details as well as current status and ultimately DOI reference are all tracked to allow accurate snapshots be captured in real time. In this particular process all partners are informed (via the Project Coordination Committee mailing list) to minimise any potential for duplicated effort.</td>
</tr>
</tbody>
</table>

The intent of these processes is to manage dissemination in as lightweight a way as possible, maximising the time available for both the support of dissemination in general, and the participation in the distinct activities, as detailed in the following chapters.
3 Dissemination Support

Numerous initiatives have been undertaken to support the dissemination of content from SLA@SOI. These include the branding of the project, the web presence of the project, set up of distribution channels, media generation, and event-support.

All of these are now described in some detail.

3.1 Branding

Consistent branding helps to reinforce the messaging of a project and strengthen the impact of dissemination activities. SLA@SOI has taken several measures to help create a strong, consistent, recognisable project identity. These measures include developing an appropriate project logo, preparing document templates, and implementing website skins.

3.1.1 Logo and Style Guide

To help create a strong SLA@SOI identity and brand, the project logo and style guide was finalised early on within the project, and is used extensively on all project dissemination materials, be they physical or electronic.

This SLA@SOI logo was designed based on the unique requirements and attributes of the project. Some considerations worth pointing out include:

- The logo was designed with the aim of communicating that SLAs are systemically propagated downwards towards, and specifically linked to, parts of an infrastructure.
- The core of this is the link between SLA and SOI and that is why the ‘@’ symbol links both the text and the graphic elements.
- The visual dynamic of the design is that of a hurricane shape where the SOI squares on the bottom right are driven up and linked to the SLA contract on the top left. This dynamic is then carried from left to right along the logo text to begin the process again. The link between these is integrated into the logo to convey a sense that the SLA@SOI process is transparent from the first look.
- The italicisation of the text is to convey a sense of forward movement and dynamism giving the impression that SLA@SOI is moving in a clear direction.
- The horizontal shape was adopted to permit use in slide titles, headers and footers where the on screen real estate is horizontal.
- The colour use is to convey a serious and trustworthy message. This is achieved by using variations on blue which are frequently used for conservative and businesslike logos. A white background is adopted to
simplify use on paper and plastic materials, and avoid the need for coloured margins which can cause complications when printing.

### 3.1.2 Document Templates

Both Microsoft Word* document and Microsoft PowerPoint* presentation templates have been created and made available to the consortium to help create a uniform look and feel for presentations. These templates, some of which are illustrated in Figure 3 below, employ a consistent colour scheme and fonts to help keep the project messaging consistent. The project colour palette and example diagrams are available in the presentation template. These templates are available in SVN⁴.

![Figure 3: SLA@SOI Templates](image)

### 3.1.3 Website Skins

The consortium is creating various online web-presences, and these are all being given a consistent branding treatment via the use of appropriate skins. In particular, the web site, the wiki and the maven generated websites have all being given a consistent look and feel.

⁴ [https://svn.fzi.de/svn/sla_at_soi/](https://svn.fzi.de/svn/sla_at_soi/)
3.2 Web Presence

SLA@SOI is an advanced ICT research project and as highlighted by the stakeholder analysis an appropriate internet presence plays a fundamental role in its successful dissemination. The SLA@SOI project is represented on the internet via a brochure website, a wiki, and – in the near future - by an open-source project website and accompanying maven-generated technical websites dedicated to the software being developed. An internal SVN repository has also been deployed to facilitate content creation and distribution, as well as source-code management.

3.2.1 Website

The SLA@SOI project website, http://www.sla-at-soi.eu/, has been designed, provisioned and deployed on the internet and was initially designed to quickly address the key questions that external visitors to the website are expected to have including:

- What is the project about?
- What is the project delivering, and why?
- Who is participating in the project?
- What additional detail is available?
- Who can be contacted for more information?

The SLA@SOI project website is one of the main tools for disseminating information about the consortium and its achievements. It provides comprehensive information about the project enabling any visitor to understand its context and objectives. The current homepage is illustrated in Figure 4.

![SLA@SOI Homepage](image-url)
Its structure is designed to provide easily accessible information. It also allows the display of news and events organised by the consortium. The website currently includes the following sections:

- **Homepage**: briefly introducing the project and providing key facts;
- **Newsroom**: providing the latest news from the project and also giving access to press releases
- **Research**: with detailed information on the consortium and the focus areas being tackled. Each work package has its own dedicated page, including links to relevant publications and publicly available deliverables.
- **Events**: including information on key upcoming events
- **Publications**: a comprehensive list of all publications and presentations available from the consortium, and a single page linking to all publically available deliverables.
- **Resources**: provides a list of websites of European Institutions and NESSI Strategic Projects and other resources of particular relevance.
- **Contact Us**: allows the public to contact the consortium with any follow-up questions that visitors to the website may have.

The content of the website is updated regularly to make sure the project developments are reported in real time. Relevant news and press releases from all the relevant partners are posted on a regular basis for interested web site users and visitors.

Since its initial deployment, the project website has received several enhancements and it will continue to evolve as the project itself matures. In particular, a Content Management System is now being used to manage the SLA@SOI website and its content. This helps facilitate the update of content, as well as integrate additional features such as RSS to support additional communication channels.

The dedicated server provisioning solution that has been adopted by the project delivers the flexibility to choose the most appropriate tools and technologies to support the future web-site needs of SLA@SOI.

**Google Analytics**

In order to get a better understanding of the usage of the SLA@SOI project website and wiki, both were registered with the free Google Analytics*5 facility. This enables powerful reporting on the website and wiki access statistics, giving a very clear picture of information such as:

- How many users are visiting the site
- What links and pages are more popular than others
- What websites are users coming from
- Where are visitors coming from geographically

As such, Google Analytics is helping the consortium determine the effectiveness of its web tools and targeted dissemination activities. The Google Analytics Dashboard is illustrated in Figure 5.

*5 [http://www.google.com/analytics/](http://www.google.com/analytics/)
The figure above, which shows the usage trend of the SLA@SOI website between June 2008 and July 2010, illustrate a steadily increasing usage of the website as the project has matured.

It also shows that the SLA@SOI website, since it was launched, has received about 22,600 visits and a total of 56,000 page views occurred. On average, visitors spent about 2 and a half minutes on the SLA@SOI site.

This figure also illustrates various spikes of interest in the website. These are associated with blog posts made by SLA@SOI researchers on the website, some of which have attracted significant interest, especially if they discuss a topic currently being debated by the cloud community online.
Figure 6 shows that, not only has the SLA@SOI website received about 22,600 visits, but these visits were from more than 15,600 absolute unique visitors, highlighting the audience SLA@SOI is attracting.

Figure 7 above describes the various traffic sources to the SLA@SOI project website. Comparing the traffic sources at the end of period 1 to the end of period 2 it can be seen that more visitors are finding the website from referring websites.
and search engines, rather than directly typing in the website URL. This shows the increasing relevance of the website to the online community.

Table 2: Traffic sources Period 1 vs. Period 2

<table>
<thead>
<tr>
<th>Traffic Sources</th>
<th>End Period 1</th>
<th>End Period 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Traffic</td>
<td>40%</td>
<td>24%</td>
</tr>
<tr>
<td>Referring Sites</td>
<td>37%</td>
<td>47%</td>
</tr>
<tr>
<td>Search Engines</td>
<td>23%</td>
<td>28%</td>
</tr>
</tbody>
</table>

If we investigate further, we can see that there are at least 281 sources and mediums referring to the SLA@SOI website. Below are the top 10 sources:

Figure 8: Top 10 sources referring to SLA@SOI
Figure 9 shows the SLA@SOI website attracting visitors from across the globe, being accessed from 150 countries. The majority of the visitors, to date, have been from North America, Western Europe, India and Australia. Of note, the North America visitors are from states and cities not necessarily associated with the project. Mountain View (home of Google) and Virginia (associated with US Government) feature highly in the result breakdown.

Below are the top 10 countries that have visited the SLA@SOI website:

These figures above show some of the information gained from using the free Google Analytics facility to get a better understanding of the usage of the SLA@SOI project website. The same type of information is being obtained for the SLA@SOI wiki, but as the wiki is now largely used for internal dissemination work, an analysis of visitors is not presented here.
3.2.2 Wiki

The potential need for a project wiki was identified during the project negotiation phase and taken into consideration during the creation of the initial project website. After some analysis of the needs of the consortium, it was decided to implement a wiki using the DekiWiki\(^6\) engine. As well as supporting user permissions (allowing consortium only areas in the wiki), this platform offered rich multimedia support, the ability to script functionality, and an easy to use hierarchical structure.

The wiki was configured with the SLA@SOI branding and logo, and an initial hierarchy and template pages defined to simplify initial content creation. Scripts were written to trivialise common tasks, for example the setting up of a page to run a meeting. The top level pages are publically visible and were made to mirror the content of the project website. The pages under the Workspace folder were restricted to the consortium, and are only visible to authenticated users. A snapshot of the content can be seen in Figure 11.

![Image of wiki sitemap]

Figure 11: Extract of Wiki sitemap

\(^6\) [http://sourceforge.net/projects/dekiwiki/](http://sourceforge.net/projects/dekiwiki/)
The wiki has proved to be a popular and powerful tool for supporting the internal collaboration and dissemination within the consortium. Different work packages use the wiki in different ways, but it is particularly popular for facilitating meetings (capturing logistics, agenda & minutes). Collaborative content is also housed there, including the evolving guidelines for SLA@SOI developers, and various state-of-the-art results of various tasks. The overall homepage for the Workspace is illustrated in Figure 12.

![Consortium workspace in the SLA@SOI wiki](image)

**Figure 12: Consortium workspace in the SLA@SOI wiki**

The project wiki currently hosts over 1500 pages which are being continuously expanded, updated and reorganised. Conveniently, as pages are relocated within the hierarchy, DekiWiki keeps track of both the old and new locations, and automatically redirects users requesting the original page to the new location.
3.2.3 Developer Support

As SLA@SOI is committed to produce largely open-source code, it is important for dissemination purposes that appropriate reference material is in place to support the engagement of external developers. This should include a description of the code, its architecture, its license, and its development team. The APIs should be explained in detail, and evidence of robustness should be provided in the form of coding style violation, unit test coverage and dependency divergence reports.

To this end, as well as to address the integration challenges of large software projects, the SLA@SOI development team has chosen to adopt Apache Maven\(^7\) to manage software builds. It supports the automatic creation of an entire website dedicated to the software being built, including all the detail that open-source software developers have come to expect and rely on.

The SLA@SOI development team has implemented a SLA@SOI specific maven skin. An example of a Maven generated website is illustrated in Figure 13.

![Automatically generated Maven website](http://maven.apache.org/)

Maven supports the customisation of the formatting of the generated website via skins. A skin was created so that the SLA@SOI Maven websites have a look and feel consistent with the overall project website and wiki.

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\(^7\) [http://maven.apache.org/](http://maven.apache.org/)
3.2.4 **SLA@SOI Project Document Repository**

The SLA@SOI consortium has adopted the use of a subversion repository (SVN)\(^8\) to provide a central location for sharing arbitrary project files. As well as supporting version control and change-logging, SVN has an internet interface allowing documents to be referenced by URLs. This allows emails within the consortium to include simply hyperlinks to relevant documents, rather than copies of the documents themselves.

The repository serves for storing all kinds of project relevant documents or files such as working documents, presentations, diagrams, deliverables and source code, and allows documents to be viewed and edited even whilst offline. The logging and versioning support built into SVN help avoid the inadvertent loss or overwriting of data.

By using SVN the project partners can make sure that everybody within the consortium has access to the documents and the author can also easily update documents in a clear and transparent way. Documents can be referenced via URL from the Wiki or from a web page.

The repository is structured as follows:

- **Contracts**: The project contracts (GA, CA) including Description of Work (DoW).
- **Deliverables**: All official project deliverables (internal deliverables stored by the respective work package).
- **Management**: Partner and activity reports, reviews, as well as PCC and PMT related content.
- **Meetings**: Resources for all kinds of project and review meetings (with the meeting schedules, participants and minutes preferably stored in Wiki). WP-specific meetings preferably stored in area of respective work package.
- **Resources**: Project resources such as templates, presentations, fact sheets, marketing material, publications, and images.
- **Software**: All software related artefacts such as source code, binaries, and build files.
- **Work packages**: Work package specific information (WP A1-A6, B1-B9 and C1) including WPLB (WP Leading Board).

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\(^8\) [https://svn.fzi.de/svn/sla_at_soi/project/](https://svn.fzi.de/svn/sla_at_soi/project/)
3.3 Distribution Channels

3.3.1 Mailing Lists

The consortium has set up numerous mailing lists to support the targeted dissemination of material from the project. Currently these lists are used for internal consortium purposes only, but a substantial list of external stakeholders has been set up based on contacts networks to support special one-off external dissemination activities.

3.3.2 LinkedIn Group

Conscious of the growing importance of social networking, SLA@SOI has set up a dedicated SLA@SOI group on the popular LinkedIn social network. The SLA@SOI LinkedIn Group has been used to provide news and updates to its members. As the project results become ready for external take up, we expect activity to increase in this group.

3.3.3 RSS Feeds

RSS feeds provide a means for web-users to subscribe to feeds of information that may be of interest to them. By using RSS aggregators such as Google Reader they can view all of their feeds from a central place. SLA@SOI has incorporated RSS functionality into its website to allow arbitrary people subscribe to any SLA@SOI newsfeeds that may be of interest.
3.4 Media Generation

3.4.1 Brochures, Posters and Presentation materials

General introductory brochures, posters and presentations have all been created to support the dissemination of SLA@SOI at arbitrary events. Initially at a high-level, these materials include general project details such as vision, objectives, consortium makeup and approach, and have been refined as the project matures.

![Brochures, Posters and Presentation materials]

Figure 15: Selection of SLA@SOI materials

This content has at this stage found its way onto the European Commission CORDIS website, the European Commission printed literature, has been distributed at conferences such as NESSI and the Future Internet Assembly in Valencia held in April 2010, and is also available off the SLA@SOI website. The Intel Open Innovation Lab in Ireland is also displaying this material in its showcase area to help increase awareness of the project.
3.4.2 Press Releases

To satisfy the more traditional forms of media, SLA@SOI press releases are being issued on an as-needed basis to highlight important milestones and events during the project lifetime. These press releases, suitable for printing, are also being made available via the project website. The first SLA@SOI press release is reproduced in Figure 16.

Press Release #1: European research project SLA@SOI, led by SAP, has commenced.

Services as tradable goods.

The European-funded research project SLA@SOI (Empowering the Service Economy with SLA-aware Infrastructures) will enable the flexible trading of IT services as economic goods.

With a kick-off meeting on June 24, 2008 hosted by SAP in Karlsruhe (Germany), a consortium of 13 leading industrial and academic partners officially launched a significant 36-month project to drive progress in Information Technology issues critical to the evolution of a service based economy.

The transformation of Europe’s economy from product-oriented to service-oriented has come to a critical point. In all industries and domains, IT has become a key factor in the provision of services. However, actual service negotiation and provisioning still requires significant, often manual effort both for the providers and customers.

The vision of SLA@SOI is the ability to flexibly trade IT-based services as economic goods, i.e. under well-defined and dependable conditions, with automated negotiation and self-management, and with clearly associated costs. This will constitute a milestone for the ongoing transformation of the current Internet towards an Internet of Services.

The technical approach of SLA@SOI is to define a holistic view for specifying, negotiating and managing the conditions under which services are provided. So-called service level agreements (SLAs) will allow these conditions to be expressed at both business and IT levels. An integrated management approach within a service-oriented infrastructure (SOI) will allow for transparent management across all views and layers of a system. Industrial relevance will be assured by a range of highly complementary use cases including ERP hosting, Service Aggregation, Enterprise IT management, e-Government and Financial Grids.

SLA@SOI is a 3 year, €15.2M project funded by a €9.6M grant from the European Commission Framework 7 (FP7) Research Program.

The SLA@SOI consortium partners are: SAP AG, Engineering Ingegneria Informatica, Intel Corporation, Telefónica Investigación y Desarrollo, Universität Dortmund, FZI Research Centre for Information Technologies, Fondazione Bruno Kessler, Politecnico di Milano, City University, Queens University Belfast, XLAB, GFI and etel.

Figure 16: First SLA@SOI press release
3.4.3 Newsletters

The SLA@SOI consortium has produced a number of newsletters to collate information of relevance to the external community. These have highlighted recent milestones and output, summarised project progress to date, and described short, medium and long-term plans. The consortium may invite stakeholders external to the consortium to submit content in future newsletters, to help broaden the scope of the newsletter and add some external context and perspective.

Figure 17: The inaugural SLA@SOI Newsletter
3.4.4 Media Articles

As the opportunity presents itself, articles are being submitted to appropriate publications. Recently a three page article was published in the Projects magazine. Available free online at http://www.projectsmagazine.eu.com/, the issue featured a keynote interview with the new Commissioner for Research, Innovation and Science, Máire Geoghegan Quinn, and coincidentally was immediately followed by an article about the RESERVOIR project.

![Figure 18: Projects Magazine Article](http://www.projectsmagazine.eu.com/)
3.4.5 Multimedia

As the SLA@SOI project matures, multimedia technologies are being employed where appropriate to help address particular dissemination niches. In particular, each use-case now boasts a dedicated Flash animation introducing the use-case scenario and explaining how they will be enhanced by enabling SLAs.

Figure 19: Screenshot of Flash Animation for the eGovernment use case

Updated animations, screencasts and YouTube* videos will all be prepared when particular messages and target audiences lend themselves to these approaches. The content will be created in close consultation, of course, with the appropriate consortium partners.
3.5 Events

3.5.1 Calendar

The SLA@SOI consortium is large and engaged in a very active field of research. In order to help keep pace with the plethora of potentially relevant events being held locally, in Europe and beyond, a dedicated Google Calendar* has been created and integrated with the project websites, as illustrated in Figure 20.

![SLA@SOI Google Calendar](image)

Figure 20: SLA@SOI Google Calendar
3.5.2 Event Tracking

Whilst a calendar is useful for managing dates and times, other context such as reference websites, background information, SLA@SOI specific opportunities and summaries of the event outcomes should, ideally, be tracked. To this end, a wiki template has been created and is being adopted as a central way to coordinate the engagement of the consortium with external events. A list of some of the events added to this list is illustrated in Figure 21.

![Wiki Screenshot](image)

**Figure 21: Dissemination Events tracking on wiki**

Each partner can add new events to the calendar of events by simply clicking on the “Add a new event” button. Once done, the partner can add additional information concerning the specific event into the template. The main categories are general information, SLA@SOI specific, and results and follow-up, and an example event is illustrated in Figure 22.
Figure 22: Example Dissemination Event report from the wiki
4 Dissemination Activities

4.1 Publications

With a significant research component, SLA@SOI has been publishing extensively throughout the lifetime of the project. Initially at quite an abstract and general level, publications have tackled more focused topics as research has matured.

To date, over 70 conventional publications have been prepared included papers submitted to external conferences and workshops, technical papers published directly by the consortium, and chapters contributed to relevant books. At the time of writing 11 have been submitted and are awaiting an acceptance decision, 21 have been accepted for publication in the future, 30 have already been published, and the remainder were position paper submissions to NEXOF-RA for consolidation into broader reports and the reference architecture.

Details of these publications are included in Appendix C, and are also available on the publications section of our website\(^9\). The Digital Object Identifier (DOI)\(^10\) reference code is provided on our online publications list, where possible, to aid the immediate citation and location of each article.

To help illustrate the standard at which these publications are aimed at, the ranking of the conferences and journals has been identified where possible, as determined by the Computing Research and Education Association of Australasia\(^11\).

Some key papers and book chapters submitted to external conferences and organisations in Period 2 include:

- 'Statistical Inference of Software Performance Models for Parametric Performance Completions' by Jens Happe, Dennis Westermann, Kai Sachs, and Lucia Kapova, accepted by QoSA 2010, an A-rated conference
- ‘Parameterized Reliability Prediction for Component-based Software Architectures’ by Franz Brosch, Heiko Koziolek, Bara Buhnova, Ralf Reussner, accepted by QoSA 2010, an A-rated conference
- ‘Describing and Verifying Monitoring Capabilities for SLA-Driven Service Based Systems’ by Marco Comuzzi, George Spanoudakis, published in Proceedings of CAiSE 2009 Forum, in conjunction with 21st Int. Conf. on Advanced Information Systems Engineering (CAiSE 09), an A-rated conference
- ‘SLA BUSINESS TERMS Model for a Telecom Operator Business View of SLA’ by Carlos Bueno Royo, Juan Lambea Rueda, Óscar L. Dueñas Rugnon, Beatriz Fuentes, Alfonso Castro, accepted by ICE-B 2010, a B-rated conference
- ‘Web Service Trust: Towards a Dynamic Assessment Framework’ by George Spanoudakis, Stephane LoPresti, published by 4th Int. Conf. on Availability, reliability, and Security (ARES’09), a B-rated conference

\(^9\) http://www.sla-at-soi.eu/publications
\(^10\) http://www.doi.org
\(^11\) http://core.edu.au/

Future publications against high-rated conferences will be prioritised where possible to maximise the impact of dissemination efforts.

Over 10 technical blog posts have also been posted by consortium members on the project website to date. Topics have included:

- What’s in a Service Level Agreement?
- So what’s in OVF?
- Hierarchical Monitoring Systems for Efficient Distributed System Management
- Complex Service management
- SLA Focused Financial Grids
- Challenges in SLA Translation
- Business Fundamentals of SLAs
- Dynamic Setup of Monitoring infrastructures for SLA Management
- Design-Time Prediction of QoS Properties
- Using Cloud Standards for Interoperability of Cloud Frameworks.

Blog posts have proved to be a valuable dissemination tool, with various spikes of website activity caused by posts that hit a nerve in the community. Some blog posts have attracted interesting and insightful comments from interested parties, and follow-up contacts have been made which have lead to significant opportunities, including indeed our participation with OCCI.
Blog posts also provide a useful mechanism to announce the publication of a technical white paper. Three of these SLA@SOI papers have been published to date, typically when material or research results are ready to be published but no suitable conference or similar opportunity exists to disseminate them. The titles are:

- Challenges in SLA Translation
- Dynamic set-up of Monitoring Infrastructure for SLA Management
- Using Cloud Standards for Interoperability of Cloud Frameworks
4.2 Events

It is clear to the SLA@SOI consortium that the participation in and indeed hosting of suitable conferences, workshops and other types of events are key opportunities to network and promote the output of the project. To this end, the members of the consortium have already attended, presented and submitted papers to 70 local, national and international events as mentioned in the previous section. The consortium partners have also presented SLA@SOI at over 40 events where formal abstracts or papers were not required.

4.2.1 Events participated in by SLA@SOI

The SLA@SOI consortium has participated in a significant number of events, not only those conferences for which formal submissions were required. These
dissemination activities served to increasing an awareness of the project and are listed below.

**Period 1 Events**

1. **Virtualization & Grid Computing Forum** (May 27th, 2008 – Stuttgart, Germany - Attendance)
   **Description:** German national forum/workshop aimed at discussing trends and requirements on virtualization and Grid computing.

2. **CloudCamp** (July 16th, 2008 – London, UK - Attendance)
   **Description:** The event was organised as a way for early adopters and individual/companies to get together and see some informal presentations related to "Cloud" computing. Regarding SLA@SOI, SLAs were part of all the discussions due to the current lack of sample SLAs within current cloud providers and the level of integrity/privacy/security that enterprise computing requires.

3. **OGF 24** (September 15-19, 2008 – Singapore – Attendance, Co-chair)
   **Description:** Regular gathering of Open Grid Forum. Opportunity to participate and influence OGF working groups to provide input to standardisation/contribution to standards - one especially important effort within SLA@SOI. The most important groups being explored are:
   - JSDL: Management of Activities in relation to SLAs (see http://forge.gridforum.org/sf/projects/jsdl-wg)
   - GSA-RG: Management of service-oriented infrastructures (see http://forge.gridforum.org/sf/projects/gsa-rg)

4. **SSAIE Concertation** (September 22nd-23rd, 2008 – Brussels, Belgium – Attendance, Co-chair)
   **Description:** This was a meeting for FP6 and FP7 projects in the area of Software & Services, Grid and Software and Service Architectures and Infrastructures. SLA@SOI organised together with NESSI the collaboration session on standards.

5. **Future Internet Symposium** (September 28th-30th, 2008 – Vienna, Austria - Attendance)
   **Description:** FIS 2008 provided a forum for leading researchers and practitioners to meet and discuss the wide-ranging scientific and technical issues related to the design of a new Internet.

6. **NEXOF-RA Investigation Team Kickoff - Call 1** (October 20th-21st, 2008 – Brussels, Belgium - Presentation)
   **Description:** NEXOF-RA is a 2-year long FP7 project chartered with creating a reference architecture for an SOI. It is seeking inputs from all interested bodies, projects and individuals. Publicise SLA@SOI positions on topics identified as being of interest. Position Papers were submitted in topics of:
   - Design-Time Service Composition
   - Service-Discovery
   - Infrastructural Services
• Scalability

7. **GridCOMP - Technical Concertation Meeting** (October 22nd, 2008 – Sophia Antipolis, France - Attendance)  
   **Description:** The key objective of the EU project technical concertation meeting was to stimulate cooperation and knowledge exchange between all members of EU projects related to Components, Services, and Utilities for Grid and large scale IT systems.

8. **CASCON 2008** (October 27th-30th, 2008 – Toronto, Canada - Attendance)  
   **Description:** CASCON 2008 was the 18th Annual International Conference hosted by the IBM Centers for Advanced Studies. This “Meeting of Minds” provided an exciting forum for exchanging ideas and experiences in the ever-expanding and critical fields of software development and computing. The CASCON 2008 program included keynote presentations, technical papers, workshops, and a technology showcase.

   **Description:** The 5th Telco 2.0™ Executive Brainstorm was based on the output from the 4th Telco 2.0 Executive Brainstorm held in April 2008, and new market research and analysis from the Telco 2.0 Initiative. This event focus was: Reducing Friction in the Digital Economy: How Industry and Government could exploit latent Telco capabilities.

10. **CloudCamp Washington DC 08** (October 22nd, 2008 – Chantilly, VA - Attendance)  
    **Description:** CloudCamp was a so-called unconference where attendees could exchange ideas, knowledge and information in a creative and supporting environment, advancing the current state of cloud computing and related technologies.

11. **eChallenges 2008** (October 22nd–24th, 2008 – Stockholm, Sweden - Presentation)  
    **Description:** Networking with academia and the industry. Initial SLA@SOI work was presented and new collaboration opportunities explored.

12. **TMF Management World Orlando 2008** (November 16th-20th, 2008 – Orlando, USA - Attendance)  
    **Description:** Leading global event focusing on the management, monetization and operations of cutting-edge communications, entertainment and online services.

    **Description:** The event hosted leading visionaries from academia and industry and addressed topics as diverse as Europe’s role in shaping the future internet, ICT’s contribution to advancing the sustainability agenda and alternative research paths for future ICT components and systems.

14. **Future Internet Assembly - Madrid** (December 9th-10th, 2008 – Madrid, Spain - Presentation)  
    **Description:** Review progress since FI-Bled, consolidate results, and plan for FI-Prague. The end goal was a comprehensive integrated research agenda to help drive Europe towards the Internet of the future.
SLA@SOI participated in a Management & Governance panel discussion, facilitated Management & Governance sessions and engaged with and influenced the position papers being generated from the various sessions.

15. **Infrastructure Services from a Business Perspective Workshop, in conjunction with ServiceWave 2008** (December 13th, 2008 – Madrid, Spain - Presentation, Co-Chair)

**Description:** The workshop aimed to gather industry experts and academics to discuss innovative ideas and key challenges related to the use of Service Level Agreement related technologies and their impact on the development and provisioning of Infrastructure Services in a business-driven environment.

SLA@SOI co-organised this workshop with BREIN and Reservoir and presented the concepts of SLA@SOI. Within the workshop, the participants discussed the current challenges regarding e-Contracting and potential collaborations between the three projects SLA@SOI, BREIN, and Reservoir.

16. **Service Wave Conference** (December 10th-13th, 2008 – Madrid, Spain - Presentation)

**Description:** This conference aimed to establish the premier European forum for researchers, educators and industrial practitioners to present and discuss the most recent innovations, trends, experiences and concerns in Software Services (or the "Future of the Internet of Services") and related underlying network technologies.

SLA@SOI gave a presentation of our SLA management paper which describes the overall ambition and architecture of our framework.

17. **SSOKU 2009** (January 13th-14th, 2009 – Brussels, Belgium - Chair)

**Description:** The latest results of the ECSS White Paper on Software and Service Architectures, Infrastructures and Engineering and of the Challengers’ Research Agenda and Roadmap on Grids have been presented and served as the basis for a fruitful discussion and interaction.

SLA@SOI was invited to chair the "Standardisation Challenges" session. The meeting was very beneficial for the European Standards collaboration activity co-chaired by SLA@SOI.

18. **Cloudscape Workshop** (January 14th-15th, 2009 – Brussels, Belgium - Attendance)

**Description:** The Cloudscape Workshop examined how Cloud Computing is shaping the overall distributed computing landscape at a time when service oriented architectures are becoming increasingly more common and the benefits of cloud computing are coming into sharper focus.

19. **Open Grid Forum 25** (March 2nd-6th, 2009 – Catania, Italy – Presentation, Co-Chair)

**Description:** EGEE 4th User Forum/OGF25 & OGF-Europe’s 2nd International Event was a multi-faceted event featuring keynote talks delivered by high-profile experts from business, government and research, and a series of parallel and joint sessions focusing on specific sectors and technologies.

The SLA@SOI project was presented at Birds of a Feather on interfaces for infrastructure management. The presentations can be found at [http://www.ogf.org/gf/event_schedule/?id=1567](http://www.ogf.org/gf/event_schedule/?id=1567).

20. **Dagstuhl Seminar "Service Level Agreements in Grids"** (March 22nd-27th, 2009 – Schloss Dagstuhl, Germany - Presentation)
Description: The seminar brought together people working on SLAs in the context of grid computing mainly from computer science, but also from information systems and application areas. SLA@SOI gave two presentations during this seminar:
- "Multi-layer SLA Management"
- "The Role of Service Level Agreements in Distributed Activity Management"
SLA@SOI contributed in various discussions regarding the progress of WS-Agreement and the related negotiation and SLA@SOI will contribute to the experience document regarding the usage of WS-Agreement. Furthermore, SLA@SOI met with participants from the projects AssessGrid, BREIN, and BEinGRID, which are collaboration targets of SLA@SOI.

21. **NEXOF-RA Call 2 Kickoff** (January 26th-27th, 2009 – Brussels, Belgium - Presentation)
Description: During this meeting, experts focused on the state of the art of the different investigation teams in terms of problems to be solved, contributions received and expected success. SLA@SOI will participate to future NEXOF-RA RFPs, with the next RFP being planned in July 2009.
SLA@SOI submitted four position papers to NEXOF-RA. The specific topics addressed were:
- Infrastructure Usage Architecture
- Infrastructure Usage Monitoring
- Runtime Service Composition
- Service Level Agreements (SLAs) and Quality of Service

22. **Workshop on Research Trends and Future Directions in the Internet of Services** (March 25th, 2009 – Brussels, Belgium - Attendance)
Description: The objective of this workshop was to discuss the current research trends and future directions in the areas of:
- Convergence between the telecommunication, IT and media worlds
- Software/service engineering for the Future Internet

23. **INGRID 09** (April 1st-3rd, 2009 – Alghero, Sardinia, Italy - Presentation)
Description: Integration of Scientific Instruments with the Computing/Data Grid.
SLA@SOI gave two presentations during this workshop:
- "Essential concepts of electronic contracts"
- "Enabling Service-Oriented Infrastructures (SOIs) with certainty"

Description: A workshop focusing on collaboration within OMII UK and with researchers from other projects and initiatives. The main focus was on architectures, services, and tools, and identifying opportunities to collaborate.

**Period 2 Events**

25. **Open Grid Forum 26** (June 26th -28th, 2009 – Chapel Hill, USA – Co-chair, presentations, contribution to standards)
Description: Plenary gathered, working on plans, standardisation working groups and workshops. The most important groups being explored are:
• OCCI: Open Cloud Computing Interface (see http://www.occi-wg.org/doku.php)
• GRAAP: WS-Agreement and WS-Agreement Negotiation (see http://forge.gridforum.org/sf/projects/graap-wg)
• JSDL: Management of Activities in relation to SLAs (see http://forge.gridforum.org/sf/projects/jsdl-wg)

26. Future Internet Assembly - Prague (May 9th-11th, 2009 – Prague, Czech Republic – Presentation)
Description: An opportunity to influence position papers at the various workshops. Joe Butler attended MANA sessions. John Kennedy attended Real World Internet sessions. Initial project dissemination handout material was made available to the audience of several hundred.

27. Collaboration Meeting (June 10th, 11th – Brussels, Belgium – Co-organisation, Presentations)
Description: A meeting to facilitate collaboration by interested parties, hosted by IRMOS, SLA@SOI and European Commission. The objectives being
• to achieve a better understanding of the results of the FP6 & FP7 projects in the "Internet of Services" area
• to consolidate the collaboration activities among the projects in order to build an even stronger community
SLA@SOI Helped organise this event. Presentations were made in VSP and Service Architectures working groups. A demo was also manned.

28. SSAIE Summer School 2009 (June 16th – 19th, 2009 – Crete, Greece – Presentation)
Description: The SSAIE Summer School brings together the best international experts on software and services and graduate students, young researchers and professionals from leading academic, research and industrial organizations across Europe and around the world. CITY presented on the Monitoring Architecture in SLA@SOI at this Summer School.

29. Service Level Agreements in Grids Workshop (October 13th 2009 – Banff, Canada – Presentation, Co-chair)
Description: As Grids and service-oriented architectures evolved to a common infrastructure for providing and consuming services in research and commercial environments, mechanisms are needed to agree on the objectives and the quality of such service provision. There is a clear trend to use electronic contracts between service consumers and one or more service providers, in order to achieve the necessary reliability and commitment on both sides. Service Level Agreements (SLAs) are the means to model and manage such contracts in a unified way. This workshop will provide a forum to present current research and up-to-date solutions from research and business communities. The workshop considers Grids but also generic models for SLA management. That is, market-economic strategies, negotiation, or monitoring are also of interest.
Collocated with Grid 2009, SLA@SOI helped to organise and chair this workshop.

30. Intel/SAP Cloud Computing Workshop (October 20th, 2009 – Belfast, Northern Ireland - Attendance, Poster session)
Description: As part of the official inauguration of the SAP/Intel Collaboratory a workshop on cloud computing has been held. With key representatives from industry attending, SLA@SOI was mentioned in panel discussion and displayed in the poster session.
31. **Future Internet Assembly - Stockholm** (November 23rd-24th, 2009 – Stockholm, Sweden - Presentation)  
*Description:* An opportunity to network with the European Commission an, industry and academic players, Intel attended various workshops including RWI and FiSO and also presented SLA@SOI at the MANA session.

![Figure 26: Joe Butler presenting SLA@SOI at FIA Stockholm](image)

*Description:* Contributions from SLA@SOI included:
- conducting a special workshop on SLA management (formally co-organized by SLA@SOI)
- presentation of an updated Overview paper
- presentation of BBD paper
- presentation of year 1 demonstrator in specific NESSI session

*Description:* This workshop was formally co-organized by SLA@SOI. The workshop aimed to tackle the research problems around models, concepts, languages and methodologies that enable the specifications of non-functional properties and Service Level Agreements in the context of Service Oriented Computing. This edition aimed also at providing a forum to address the main challenges of bringing transparent, multi-level, and holistic NFP and SLA management into service oriented systems. Such an effort naturally requires a multi-domain and multi-disciplinary approach, for instance, service-oriented architectures, model-driven development, software engineering, performance management, and enterprise computing. This enlarged view over the NFP and SLA topics was reflected in the new title including Management.

34. **ETSI Plugtest and Workshop on Grids, Clouds, Service Infrastructures**  
(November 30th-Dec 3rd 2009, Sophia Antipolis, France)  
*Description:* The ETSI TC Grid was organising a plug-test and workshop event to assess and disseminate latest solutions and trends of commercial as well as open source products in this domain. Prof. Ramin Yahyapour presented SLA@SOI in the “Emerging trends around Grids, Clouds & Service Oriented Infrastructures” session. The title of the call was “Empowering the Service Economy with SLA-aware Infrastructures in the project SLA@SOI”.

35. **RealTime WebCamp** (February 20th, 2010 - Ljubljana, Slovenia - Presentation)  
*Description:* A BarCamp type event in organization of Hekovnik TP1. An introductory presentation was given on SLA@SOI.
36. **OGF28** (March 15\(^{th}\) -18\(^{th}\), 2010 – Munich, Germany – Co-chair, presentations, contribution to standards))
Description: plenary gathered, working on plans, standardisation working groups and workshops. The most important groups being explored are:

37. **FESCA 2010** (March 27\(^{th}\), 2010 – Paphos, Cyprus – Co-organiser)
Description: FESCA addresses the open question of how formal methods can be applied effectively to these new contexts and challenges. FESCA is interested in both the development and application of formal methods in component-based development and tries to cross-fertilize their research and application.

38. **NESSI Project Summit** (April 12\(^{th}\)-13\(^{th}\), 2010 – Valencia, Spain – Presentations, Demonstrations, Workshop)
Description: Following the recent advances at NESSI and at Future Internet levels, NESSI has organised this, its first, NESSI Summit. This event focused on the existing and future results emerging from the coordinated research of NESSI Strategic (NSP) and Compliant Projects (NCP). It also highlights how NEXOF, the NESSI Open Service Framework, is a unique coherence mechanism providing the way to put research results in relation to each other and increase their overall impact and uptake. SLA@SOI presented a joint presentation on infrastructure, a dedicated workshop on SLA@SOI and manned a dedicated SLA@SOI stand with demos.

Description: An event for those interested in all things cloud. With over 80 attendees in Dublin and 60 in Cork, it proved an interesting networking session with presentations by OpSource, StormMQ, SLA@SOI - Intel, Hosting365, emailcloud and Microsoft.

**Future Internet Assembly - Valencia** (April 14\(^{th}\)-17\(^{th}\), 2010 – Valencia, Spain – Attendance, Co-chair)
Description: An opportunity to foster collaboration and drive the research agenda in European Future Internet initiative. SLA@SOI representatives attended many tracks, and co-chaired the Future Internet Enterprise session.

40. **Research @ Intel Day** (May 4\(^{th}\), 2010 – Brussels, Belgium – Demonstration, Attendance)
Description: An event showcasing some of Intel’s research efforts in Europe to which industry, academia, government and the media are invited. The event included a specific exhibit of SLA@SOI, focusing on infrastructural aspects.

41. **2\(^{nd}\) Summer School on service and Software Architectures, Infrastructures and Engineering** (June 28\(^{th}\)-July 2\(^{nd}\), 2010 – Crete, Greece - Presentation)
Description: "The SSAIE Summer School brings together the best international experts on software and services and graduate students, young researchers and professionals from leading academic, research and industrial organizations across Europe and around the world". A training session on Service Level
Agreements was presented by representatives from SLA@SOI and from level of discussion was well received. SLA@SOI presented:

- Service Accreditation or Service Trust/Security (by George Spanoudakis, CITY)
- Service Level Agreements: “A review of standards, technologies, and the work of SLA@SOI EU project (by Philipp Wieder, TUDO)

As the project matures and results become available, the consortium has began organising its own workshops, tutorials and dissemination events to increase the awareness of SLA@SOI, engage with external stakeholders and calibrate our results. These plans are introduced in Chapter 5.

### 4.3 Collaborations

The SLA@SOI consortium is collaborating with external bodies, in particular the NESSI open framework and various other related initiatives. In fact, collaboration with external initiatives and organizations is a key for leveraging the results of SLA@SOI.

The objective of the collaboration is to guarantee the long-term sustainability of the project and the outreach of the results to communities and markets out of the project consortium. The SLA@SOI consortium will achieve such objective thanks to collaboration activities both with the academic and the industry communities.

Collaboration with academics, industry and other representative groups is planned and underway. Indeed, so far, we have identified and described 29 distinct collaboration initiatives. Of these 29 collaboration activities, 16 are still ongoing, while 13 have been completed during the first two years of the project. Each activity identifies a specific target for the collaboration and specific collaboration goals and modalities, reports the actions we have already undertaken and, if the activity is still ongoing, the plan for the future activities.

We have also planned for direct actions to foster additional collaborations, such as dedicated seminars that will attract the key researchers in the field.

The initiatives SLA@SOI is collaborating in can be grouped in six different categories, namely:

- Collaborations within the SSAI&E cluster
- Collaborations with NESSI and NEXOF
- Collaborations with the Future Internet Assembly
- Collaborations with specific European FP6 and FP7 projects
- Collaborations with specific initiatives outside FP7
- Collaborations with industry

For each of these categories, we have defined one or more concrete collaboration tasks, which identify a specific target for the collaboration and specific collaboration goals and modalities.

A strategy has been defined for further developing collaborations during the final year of the project. This strategy is based on the following two principles:
Focus on key collaboration tasks. While a broad set of collaboration tasks has been effective in the initial phase of the project in order to guarantee coverage and diversity, it is now time to focus on those tasks that have been more successful and/or more strategic for the project.

Focus on exploitation. During the first years of the SLA@SOI project, collaboration activities have focused on the scouting of existing results to be used by SLA@SOI, or on joint developments of research results. In this final phase, the focus should be on facilitating the exploitation of the SLA@SOI results, including exploitations beyond the end of the project.

In particular, we plan to establish new collaboration with the new SSAI projects that have been launched recently, and that will terminate much after the end of the SLA@SOI project. We also plan to strengthen the collaborations with companies, in particular SMEs, since collaborations in this area play a key role for the exploitation of the SLA@SOI results beyond the end of the project.

Additional information concerning the collaboration strategy and activities can be found in the Deliverable D.B8c Annual Review of External Collaborations [3].

4.4 Standards

The overall objective of the Task B.8.2 is to "implement a general procedure on how to assess, track and contribute to relevant standardization possibilities and acts as a collaboration gateway to relevant standardization bodies."\(^{12}\)

To achieve this, it is necessary to have an understanding of what kind of standards the project uses and, in addition, the project needs to continuously update standards' users on news and progress regarding their standards and to channel contributions originating from the project to standardisation bodies. This process is outlined in Section 4.4.1.

The SLA@SOI Standardisation Process. Please note that the standardisation process is compliant to the one proposed by the European Standardisation Collaboration Group\(^{13}\) which is responsible for all Objective 1.2 projects. Section 4.4.2 then lists the standards which are of used and contributed to in SLA@SOI. Finally, Section 4.4.3 lists the major results from the standardisation activity in SLA@SOI.

4.4.1 The SLA@SOI Standardisation Process

The current list of standards which are of interest to SLA@SOI (see Section 4.4.2) contains a large number of standards which are of interest to SLA@SOI, but where the project’s goals regarding actual contribution to the standard differ heavily. With respect to some standards, SLA@SOI sees opportunities to generate measurable impact on the actual standardisation process while other standards are primarily used by the project and therefore their evolution has to be monitored. Moreover, SLA@SOI assigns people responsible within SLA@SOI who actually follow the process of a particular standard or actively contribute to it. To achieve a realistic and measurable approach towards standardisation, three steps have to be executed:

1. Assignment of standards' “owners”
2. Classification of standards

\(^{12}\) SLA@SOI, Annex I - Description of Work
\(^{13}\) http://www.eu-ecss.eu/contents/private-area/standards/standards
3. Tracking of progress and SLA@SOI's contribution (via the SLA@SOI Wiki)

Steps 2 and 3 have to be executed frequently for relevant standards. In addition, it is necessary to monitor whether the on-going project progress washes new standards ashore, which than have to be added. Please find more details regarding the different steps in the respective sections below.

4.4.1.1 Assignment of Standards' "Owners"

Every standard which is of interest to SLA@SOI needs an owner who is responsible for it. The owner can pursue the contribution on four different levels:

1) Measurable, direct impact of SLA@SOI results through contributions to standards (e.g. starting a new specification)
2) Specifically requested leadership contributions (e.g. working group chair)
3) General and active participation in relevant working groups
4) "Passive" follow-up of relevant evolving standards or specifications (monitoring and reporting)

For each standard relevant to SLA@SOI at least one owner has to be assigned who acts as the interface between the respective standardisation body, SLA@SOI, and the Standards Collaboration (for more information on collaboration, please refer to D.B8.c). The standards’ owners are maintained through the SLA@SOI Wiki.

4.4.1.2 Classification of Standards

To understand the involvement of SLA@SOI regarding the different standards and to measure impact properly, it is necessary to provide a classification of standards. The following categories of standards are proposed:

1) Being adopted – standards or specifications which are adopted by the SLA@SOI framework
2) Being considered – standards or specifications which are not yet adopted, but which the project strongly recommends to consider in the future
3) Area lacking standards and specifications - areas where SLA@SOI does not see any existing standards or specifications
4) Deprecated - standards or specifications which have been followed by SLA@SOI, but further tracking has been stopped.

This classification is regularly updated and communicated via the project’s Wiki.

Regarding the first category, standards being adopted, and in relation to the discussion about open and non-open standards, it has been decided to also track the license under which the respective standard is published. If this tracking process reveals that there are standards adopted by SLA@SOI which are closed and could potentially create IPR issues, then these should be dealt with by the WPLB on a case-by-case basis.

4.4.1.3 Tracking of Progress and SLA@SOI’s Contribution

The progress regarding each standard will be tracked and assessed regularly. This includes the following information:

- Progress during the previous reporting period
- Overall impact achieved by SLA@SOI (only for standards with "active" contributions”)
- Plans and expectations for the next reporting period
The SLA@SOI Wiki is used to track and assess the progress of standards’ contribution.

### 4.4.1.4 General Risks of the process

According to previous experience with standardisation work in European projects, a number of general risks have to be mentioned regarding the expected impact and exploitation of standardisation work. First of all, it is difficult to properly measure the impact a project has on a particular standard. This is due to the fact that standardisation contribution is normally bound to people, not to projects. Therefore, in documents and reports, the respective affiliation of a contributor is acknowledged, not the project actually funding the contribution. Furthermore, people often contribute significantly during discussions or via electronic means, but that does not necessarily result in some measurable impact (like being listed under contributors) during the lifetime of a project.

Then, as already pointed out before, results are often created after the lifetime of the project through personal or institutional effort, which is then, as described above, acknowledged to the respective person or institute. This may then, regarding the public perception, not result in the expected promotion of project results.

And last, but not least, experience shows that in contrast to the amount of standards which are followed, normally only a small number of standards actually receive real contributions from a project. The reason here is obvious: standardisation activities like for example those guided by W3C or IETF expect from participants a major contribution in terms of working hours. Although the standardisation support granted by SLA@SOI is significant, it is not possible to compete with companies like Microsoft or IBM, which, in cases where they want to push a certain standard, assign people to work full-time on a certain standard.

But due to our involvement in NESSI and the direct link to the Standardisation collaboration, proper dissemination in combination with keeping the expectations realistic is possible.

### 4.4.2 List of Standards

The project partners will embrace and enhance open standards where possible in order to allow for the best possible exploitation of the project results. Whilst many technical standards are being considered for adoption within the project implementation, those standards which the project may be able to offer enhancements to include the following:

- CloudAudit (A6), CloudAudit Working Group
- Common Information Model (CIM), DMTF
- Distributed Computing Infrastructure Federation Protocol (DCIFP), Open Grid Forum
- GLUE (GLUE), Open Grid Forum
- Information Framework (SID), TeleManagement Forum (non-open standard)
- Java Management Extension (JMX), Java Community Process
- Modelling and Analysis of Real-time and Embedded systems (MARTE), OMG
- Open Cloud Computing Interface (OCCI), Open Grid Forum
- Open Virtualization Format (OVF), DMTF
- OSGi (OSGi), OSGi Alliance
• Service Component Architecture (SCA), OSOA
• System Definition Model/System Modelling Language (SDM/SML) OMG
• Web Services Agreement (WSAG), Open Grid Forum
• Web Service Agreement Negotiation (WSAG Negotiation), Open Grid Forum
• Web Services Business Process Execution Language (WS-BPEL), OASIS
• Web-Based Enterprise Management (WBEM), DMTF
• Web Services for Management (WS-Management), DMTF
• Web Service Distributed Management (WSDM), OASIS

Please note that those standards to which SLA@SOI actually contributes are listed in the next section.

4.4.3 Results Achieved During the Reporting Period

The following section outlines some of the key results for the project during year 2 which are related to standardisation

Standards with “Active” contribution from SLA@SOI

Currently, researchers from SLA@SOI actively contribute and influence three standards, which all have their home at the Open Grid Forum: (i) the Open Cloud Computing Interface (OCCI), the WS-Agreement SLA specification, and (iii) the WS-Agreement Negotiation standard. SLA@SOI contributed heavily to all these standards that are highly influential in the Cloud community and the Service Level Management community, respectively.

The current results of these contributions have already been reported in the light of the collaboration with NESSI and the detailed descriptions of the results can be found in the respective appendices E to F of Deliverable D.B8a Exploitation Plan [2].

Contribution to NESSI

During the reporting period, the NEXOF-RA project conducted a survey of standardisation activities and documented them. The survey aimed at

1. Assessing concrete contributions from your project to standards organizations and standards.
2. Assessing also the general development status of the concerned standards
3. Collecting references (such as publications, documents, links to specs, other assets such as Open Source components) to substantiate the contribution.
4. Assessing supporting organizations of the contribution and further potentials for support via NESSI and NEXOF.
5. Assessing related collaboration activities between NESSI projects that imply cross-project work on the standards contributions.
6. Establishing a link between the NEXOF patterns and standards contributions.

SLA@SOI contributed with its three major standards contributions, namely OCCI, WSA-Agreement, and WS-Agreement Negotiation to this survey.
**Standardisation Events**

The main event during the reporting period was the Internet of Services 2009 Collaboration Meeting for FP6 & FP7 Projects\(^{14}\) (June 10/11, 2009, Brussels, Belgium), where SLA@SOI co-organised together with NEXOF-RA the session on standards collaboration and where the project presented the current status of the standards work done in the project. The results from this meeting have been fed back into the standardisation process of SLA@SOI.

Based on the discussions and decision made at the at the Collaboration meeting, SLA@SOI helped the PrimeLife project and W3C to organise the W3C Workshop on Access Control Application Scenarios\(^{15}\), which was held November 17/18, 2009, in Luxembourg.

In addition to regular phone calls related to the work on standards within the SSAI&E projects, a special meeting between representatives from the European Commission, standards bodies (W3C, OASIS, ETSI) and the Standards CWG has been held in Brussels on June 15, 2010. The main objectives of this meeting were the planning of the next Collaboration event in October 2010 and the strategic planning of standardisation support in the light of the upcoming projects and the Digital Agenda.

**4.4.4 Standardisation-related Tasks planned during the following period**

During the forthcoming months, the project will extend and consolidate the list of standards. Based on the work done in the technical work packages, the list of all standards which are of interest for SLA@SOI will be evaluated in the light of potential contributions based on matured work. Then another iteration of the standardisation process will be executed, owners will be assigned to every new standard, and they will be classified.

The next major event is the Collaboration meeting taking place in October 2010 in Brussels. SLA@SOI will organise the Standards CWG session that is of special importance since it will mark the transition to the Call 5 projects due to start.

**4.5 Innovation Open Lab Showcase**

As well as these SLA@SOI specific engagements, Intel’s Innovation Open Lab in Ireland also presents an opportunity to disseminate the activities of the project. This centre regularly hosts delegations from government, the industry and academia for technically focused workshops and presentations. In recent years more than four thousand people have passed through its doors annually. SLA@SOI now has a dedicated stand in the showcase area and is frequently introduced to any visitors who may have an interest in this area. The showcase presence is illustrated in Figure 27.


\(^{15}\) [http://www.w3.org/2009/policy-ws/cfp.html](http://www.w3.org/2009/policy-ws/cfp.html)
Figure 27: SLA@SOI presence in Intel Innovation Centre
5 Dissemination Plans

The Dissemination Plan for the third year of the project includes a comprehensive targeting of project output at the key target stakeholders. There will be a sequence of key lighthouse events, in parallel with sustained dissemination through the established channels, with content tuned as per the stakeholder analysis.

The first key milestone will be in late September by which time there are plans for...

- Initial Open Sourcing of the source code
- Several stand alone technical papers
- All Year 2 deliverables to be published
- Use Case demonstrators to be showcased
- Projects Magazine article to be published
- SLA@SOI Information Day to be held collocated with ICT 2010

A significant amount of time is going into preparations of dissemination materials for these events, with revised dissemination brochures, use-case flyers and posters all being created.

These lighthouse events will of course not replace the ‘normal’ stream of dissemination activities, which are also planned to be intensified as the project matures and results of the research become available. In particular, as the year progresses

- additional software will be released open source
- more academic publications will be pursued, with leading conferences prioritised
- activity on existing communication channels: Blogs, Website, Newsletters, Seminars etc. will all be maintained
- exploitation, collaboration and standardisation activities will all be extended

All these activities will contribute towards the wider dissemination of the results of the project during this key period.

5.1 Lighthouse Events

The consortium has identified and is tracking a number of key lighthouse events in which individual partners of the consortium publicise and showcase the results of the project to date to an external audience.
### Table 3: Summary of SLA@SOI Lighthouse events

<table>
<thead>
<tr>
<th>Event</th>
<th>Focus</th>
<th>Date</th>
<th>Lead</th>
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</thead>
<tbody>
<tr>
<td>NESSI Summit Valencia</td>
<td>Overall SLA@SOI Framework Demonstrator</td>
<td>April 2010</td>
<td>TID</td>
</tr>
<tr>
<td>Research@Intel Day Europe</td>
<td>Enterprise IT Use Case – B4</td>
<td>May 2010</td>
<td>Intel</td>
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<tr>
<td>SAP Research Summit</td>
<td>ERP Use Case – B3</td>
<td>June 2010</td>
<td>SAP</td>
</tr>
<tr>
<td>SSAIE Summer School</td>
<td>Overall SLA@SOI Framework</td>
<td>June/July 2010</td>
<td>CITY</td>
</tr>
<tr>
<td>Future Internet Symposium</td>
<td>ERP Use Case – B3</td>
<td>September 2010</td>
<td>SAP</td>
</tr>
<tr>
<td>ICT-2010 / NESSI</td>
<td>Overall SLA@SOI Framework, Use Case Demos</td>
<td>September 2010</td>
<td>SAP</td>
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<tr>
<td>SLA@SOI Info Day</td>
<td>Full day event on SLA@SOI</td>
<td>September 2010</td>
<td>SAP</td>
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<tr>
<td>SLA@SOI Info Day</td>
<td>Full day event on SLA@SOI</td>
<td>September 2010</td>
<td>SAP</td>
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<tr>
<td>Open Sourcing of SLA@SOI</td>
<td>Overall SLA@SOI Framework</td>
<td>Q3 2010</td>
<td>Intel</td>
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<tr>
<td>Intel Academic Forum</td>
<td>Overall SLA@SOI Framework</td>
<td>October 2010</td>
<td>Intel</td>
</tr>
<tr>
<td>Intel Developer Forum</td>
<td>Enterprise IT Use Case – B4</td>
<td>April 2011</td>
<td>Intel</td>
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<tr>
<td>TMForum</td>
<td>Service Aggregator Use Case – B5</td>
<td>May 2011</td>
<td>TID</td>
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<td>Forum PA</td>
<td>E-Government Use Case – B6</td>
<td>May 2011</td>
<td>ENG</td>
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<td>Business Continuity</td>
<td>Summer 2011</td>
<td>SAP</td>
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<tr>
<td>Springer Series Book</td>
<td>Overall SLA@SOI Framework</td>
<td>Summer 2011</td>
<td>UDO, FBK</td>
</tr>
</tbody>
</table>

Several of the lighthouse events have already come to pass, and summaries of these activities can be found in the previous section. However others are imminent at the time of writing and so plans are well advanced. For events further out, the detailed plans have not been created yet, except for the Springer Series Book. Planning has already started for that due to the long lead-time there can be for such a publication.

### 5.1.1 SLA@SOI Information Day

At the SLA@SOI Information Day\(^\text{16}\), which will take place on September 28, 2010, in Brussels (co-located with and complementary to ICT 2010.) the project we will share and discuss its results to date. The event is designed to appeal to both scientific and industrial stakeholders. While the morning session features scientific

\(^{16}\) http://sla-at-soi.eu/events/slasoi-information-day/
and technical aspects of SLA management, the afternoon session focuses on business and adoption interests.

In particular, the SLA@SOI Information Day will address:

- Understanding
  - the importance and value of SLAs and SLA management. This topic will include a keynote from Peter Matthews, a Research Staff Member at CA Labs with a specific interest in SLAs. He will present his perspective on “Defining service characteristics for the Cloud”.
  - the key research results and technologies that support SLA management including SLA modelling, SLA negotiation, SLA planning, SLA monitoring, and SLA-aware cloud management.

- Practical experience
  - of the actual business value of SLAs in four industrial domains, namely business applications, enterprise IT, service aggregation, and eGovernment.
  - through demonstrations of effective SLA management in these four use-cases.

- Opportunity to
  - get questions answered, and meet-and-greet individual researchers.
  - learn how to benefit from and engage with SLA@SOI through adopting results, collaborating bilaterally, and engaging through SLA@SOI’s open source initiative.

As of the time of writing, more than 40 people with various backgrounds have confirmed their attendance at this event.

5.1.2 Open Sourcing of SLA@SOI

The open-sourcing of SLA@SOI is also seen as a key output of the project as it is an initiative that will expose key outputs of the project to the external community.

A specific open-source process has been set in place to identify, evaluate and release the software components for release. Once candidate software components and their owners have been agreed, the software is evaluated for minimum release criteria that must be met before release. Code Quality, IPR (licensing) concerns and documentation must all be addressed sufficiently. The code structure must also integrate with the maven build system so that a dedicated website can be automatically updated to support developers interested in the software.

At the time of writing the first tranche of SLA@SOI software components are on track for release by the end of September 2010.

5.1.3 Springer Series SLA@SOI Book

SLA@SOI will disseminate its scientific findings, framework-related results, and business scenarios in a book to provide a concise picture and valuable best practices to the community-at-large. To achieve this, a book with externally peer-reviewed contributions from SLA@SOI partners (and potentially complementary articles from collaborations or external researches) will be published towards the end of the project.

As of now, the following topical areas are the primary focus of the book:

- General introduction to SLAs/Service-level Management and the service lifecycle.
- Service-oriented Infrastructure for service-level management
• SLA foundations
• Business management
• Software management
• Infrastructure management
• Predictable systems engineering
• Standards for service-level management
• SLA applied to business scenarios
6 Conclusion

This document has described the objectives and strategies of the dissemination activities within the SLA@SOI project. Stakeholders have been profiled, Communications Channels identified and appropriate management Processes put in place.

The tools and support provided for dissemination activities have been catalogued and those activities themselves have been listed. Publications, Events, Collaborations, and Standard initiatives have all been profiled.

Significant plans are also in place for dissemination in the final period of the project. A number of key lighthouse events have been identified and are being executed.

These dissemination strategies, tools and activities of SLA@SOI will continue to be reviewed during the remainder of the project to support all emerging and evolving dissemination needs. The goal will continue to be to target the dissemination of SLA@SOI project results for maximum impact in as efficient a way as possible.
References


Appendix A: Glossary

The following list shows the most important entries of the SLA@SOI glossary.

Agreement Initiator
An agreement initiator is a party to a service level agreement. The initiator creates and manages an agreement on the availability of a service on behalf of either the service customer or service provider, depending on the domain-specific signalling requirements.

Agreement Offer
An offer is the description of the agreement relationship that is sent from agreement initiator to agreement responder during agreement creation, indicating the relationship which the initiator would like to form.

Agreement Responder
The agreement responder is a party to a service level agreement. The responder implements and exposes an agreement on behalf of either the service provider or service customer, depending on the domain-specific signalling requirements.

Agreement Template
An agreement template is an XML document used by the agreement responder to advertise the types of offers it is willing to accept.

Agreement Term
Agreement terms define the content of a service level agreement.

Business Service
A business service is exposed/invoked via at least some non IT elements.

Business Manager
A specialization of service provider: person that defines the SLATs of products and joins available services in a product.

External Service
External services are exposed across the boundaries of an organization, i.e. across at least two administrative domains.

Framework Administrator
A specialization of service provider: person that configures/adapts the SLA@SOI framework for a specific application.

Guarantee Term
Guarantee terms define the assurance on service quality associated with the service described by the service definition terms. They refer to the service description that is the subject of the agreement and define service level objectives, qualifying conditions and business value expressing the importance of the service level objectives.

Hybrid Service
A hybrid service is a set or bundle of other services where all these services are exposed to the customer but have different service interface types (e.g. an IT service and a business service).

Infrastructure Manager
A specialization of infrastructure provider: person/system that is interested to measure and control infrastructure properties.

Infrastructure Provider
A specific kind of service provider that focuses on the provisioning of infrastructure services.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure Service</td>
<td>An infrastructure service is a specific <strong>IT service</strong> which exposes resource/hardware-centric capabilities.</td>
</tr>
<tr>
<td>Internal Service</td>
<td>Internal services are exposed within the boundaries of an organization, i.e. within one administrative domain.</td>
</tr>
<tr>
<td>IT Service</td>
<td>An <strong>IT service</strong> is exposed/invoked by means of information technology. Specific classes of IT services may be software services, infrastructure services or media services.</td>
</tr>
<tr>
<td>Offered Service</td>
<td>An abstract service (more precisely: service type) which is offered by a specific <strong>Service Provider</strong> to its <strong>Service Customers</strong>.</td>
</tr>
<tr>
<td>Operation Level Agreements</td>
<td>A specification of the conditions under which an internal service or a component is to be used by its “customer”.</td>
</tr>
<tr>
<td>Service</td>
<td>A means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks. See also <strong>service interface type</strong>, <strong>service concreteness</strong>, <strong>service exposure</strong></td>
</tr>
<tr>
<td>Service Concreteness</td>
<td>The stage a service reaches over time from a fully abstract type to actually instantiated. See also <strong>service type</strong>, <strong>offered service</strong>, <strong>service implementation</strong>, <strong>service instance</strong></td>
</tr>
<tr>
<td>Service Consumer</td>
<td>Person(s) who actually consume/use the provided services. Typically they belong to the <strong>service customer</strong>.</td>
</tr>
<tr>
<td>Service Customer</td>
<td>Someone (person or group) who orders/buys services and defines and agrees the service level targets.</td>
</tr>
<tr>
<td>Service Description Term</td>
<td>Service Description Terms describe the functionality that will be delivered under the <strong>service level agreement</strong>. The agreement description may include also other non-functional items referring to the service description terms.</td>
</tr>
<tr>
<td>Service Exposure</td>
<td>Services can be exposed either internally (within the same administrative domain) or externally. See also <strong>internal service</strong>, <strong>external service</strong></td>
</tr>
<tr>
<td>Service Implementation</td>
<td>A service implementation is a possible concrete realization of a given <strong>service type</strong>.</td>
</tr>
<tr>
<td>Service Instance</td>
<td>A concrete realization of an <strong>offered service</strong> which is ready for consumption by service users. It relies on the instantiations of all the resources required for a given <strong>service implementation</strong>.</td>
</tr>
<tr>
<td>Service Interface Type</td>
<td>Describes the nature of an actually exposed service, i.e. about the nature of his invocation interface.</td>
</tr>
<tr>
<td>Service Level Consequence</td>
<td>See also <strong>business service</strong>, <strong>IT service</strong>, <strong>hybrid service</strong></td>
</tr>
<tr>
<td>Service Level Agreement</td>
<td>An agreement that takes place in the event that a service level objective is not met.</td>
</tr>
<tr>
<td>Service Level Agreement</td>
<td>An agreement defines a dynamically-established and dynamically managed relationship between parties. The object of this relationship is the delivery of a service by one of the parties within the context of the agreement. The management of this delivery is achieved by agreeing on the respective roles, rights</td>
</tr>
</tbody>
</table>
and obligations of the parties. The agreement may specify not only functional properties for identification or creation of the service, but also non-functional properties of the service such as performance or availability. Entities can dynamically establish and manage agreements via Web service interfaces.

**Service Level Objective**  
Service Level Objective represents the quality of service aspect of the agreement. Syntactically, it is an assertion over the agreement terms of the agreement as well as such qualities as date and time.

**Service Provider**  
An organization supplying services to one or more internal customers or external customers.

**SLA Manager**  
A specialization of service provider: person/system that is responsible for managing SLATs and SLA relationships.

**Software Designer**  
A specialization of software provider: person that designs/develops the architecture and components of a specific SLA based application.

**Software Manager**  
A specialization of service provider: person that defines software-based services, takes care of their management and supports the SLA manager in creating appropriate SLA templates.

**Software Provider**  
An organization producing software components which might be used by a service provider to assemble actual services.

**Software Service**  
A software service is a specific IT service which is exposed/invoked by means of software entities such as Web services, user interfaces, or software-based business processes.

**Software Component**  
Software components are the entities produced at design-time by a software provider.

**Service Type**  
A service type (or abstract service) specifies the external interface of a service possibly including non-functional aspects. It does not specify any means (components, resources) which are needed for the actual provisioning of that service.
## Appendix B: Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AOP</td>
<td>Aspect Oriented Programming</td>
</tr>
<tr>
<td>BM</td>
<td>Business Manager</td>
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<tr>
<td>B-SLAM</td>
<td>Business SLA Manager</td>
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<tr>
<td>EMF</td>
<td>Eclipse Modelling Manager</td>
</tr>
<tr>
<td>ERP</td>
<td>Enterprise Resource Planning</td>
</tr>
<tr>
<td>IE</td>
<td>Interaction Event</td>
</tr>
<tr>
<td>FCR</td>
<td>Finite capacity regions</td>
</tr>
<tr>
<td>ISLAM</td>
<td>Infrastructure SLA Manager</td>
</tr>
<tr>
<td>ISM</td>
<td>Infrastructure Service Manager</td>
</tr>
<tr>
<td>IoC</td>
<td>Inversion of Control</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
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<tr>
<td>LLMS</td>
<td>Low Level Monitoring System</td>
</tr>
<tr>
<td>LQN</td>
<td>Layered Queuing Networks</td>
</tr>
<tr>
<td>MA</td>
<td>Manageability Agent</td>
</tr>
<tr>
<td>MRE</td>
<td>Monitoring Result Event</td>
</tr>
<tr>
<td>MVC</td>
<td>Model View Controller</td>
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<tr>
<td>NFP</td>
<td>Non-functional property</td>
</tr>
<tr>
<td>ORC</td>
<td>Open Reference Case</td>
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<tr>
<td>OVF</td>
<td>Open Virtualization Format</td>
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<tr>
<td>QoS</td>
<td>Quality of Service</td>
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<tr>
<td>QPN</td>
<td>Queuing Petri Nets</td>
</tr>
<tr>
<td>PAC</td>
<td>Provisioning and Adjustment Component</td>
</tr>
<tr>
<td>POC</td>
<td>Planning and Optimization Component</td>
</tr>
<tr>
<td>POJO</td>
<td>Plain Old Java Objects</td>
</tr>
<tr>
<td>SaaS</td>
<td>Software as a Service</td>
</tr>
<tr>
<td>SE</td>
<td>Service Evaluation</td>
</tr>
<tr>
<td>SLA</td>
<td>Service Level Agreement</td>
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<tr>
<td>SLAM</td>
<td>SLA Manager</td>
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<tr>
<td>SLAT</td>
<td>Service Level Agreement Template</td>
</tr>
<tr>
<td>SM</td>
<td>Service Manager</td>
</tr>
<tr>
<td>SME</td>
<td>Small and Medium-sized Enterprise</td>
</tr>
<tr>
<td>SOA</td>
<td>Service Oriented Architecture</td>
</tr>
<tr>
<td>SW-SLAM</td>
<td>Software SLA Manager</td>
</tr>
<tr>
<td>SW-SM</td>
<td>Software Service Manager</td>
</tr>
<tr>
<td>TCO</td>
<td>Total Cost of Ownership</td>
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<tr>
<td>TOGAF</td>
<td>The Open Group Architecture Framework</td>
</tr>
</tbody>
</table>
### Appendix C: Dissemination Publications

<table>
<thead>
<tr>
<th>Authors</th>
<th>Publication title</th>
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<th>Expected publication date</th>
<th>Status</th>
<th>External Peer Review Required?</th>
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<tr>
<td>Wolfgang Theilmann, Ramin Yahyapour</td>
<td>SLA@SOI - SLAs Empowering a Dependable Service Economy</td>
<td>ERCIM News No. 83 (Oct 2010); Special Theme: Cloud Computing Platforms, Software, and Applications</td>
<td>Oct 10</td>
<td>Accepted</td>
<td>No</td>
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<tr>
<td>Wolfgang Theilmann, John Kennedy</td>
<td>SLA@SOI: The future for the Service Industry</td>
<td>Projects magazine</td>
<td>Sept 10</td>
<td>Published</td>
<td>No</td>
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<tr>
<td>Franz Brosch, Barbora Buhnova, Heiko Koziolek, Ralf Reussner</td>
<td>Reliability Prediction for Fault-Tolerant Design of Software Product Lines</td>
<td>ICSE 2011</td>
<td>Spring / Summer 2011</td>
<td>Submitted</td>
<td>Yes</td>
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<tr>
<td>Howard Foster, George Spanoudakis</td>
<td>Advanced Service Monitoring Configurations with SLA Decomposition and Selection</td>
<td>26th Annual ACM Symposium on Applied Computing Track on Service Oriented Architectures and Programming</td>
<td>Mar 11</td>
<td>Submitted</td>
<td>Yes</td>
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<tr>
<td>Peter Chronz, Philipp Wieder</td>
<td>Integrating WS-Agreement with a Framework for Service-Oriented Infrastructures</td>
<td>Service Level Agreements in Grids Workshop 2010</td>
<td>Oct 10</td>
<td>Accepted</td>
<td>Yes</td>
</tr>
<tr>
<td>Authors</td>
<td>Title</td>
<td>Conference/Book</td>
<td>Year</td>
<td>Status</td>
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<tr>
<td>Matija Cankar, Matej Artač</td>
<td>Energy consumption in a Private Cloud with dynamic SLA parameters</td>
<td>Special issue of FGCS (Future Generation Computer Systems)</td>
<td>2011</td>
<td>Submitted</td>
<td>No</td>
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<tr>
<td>Wolfgang Theilmann, Gabriele Zacco, Marco Comuzzi, Christoph Rathfelder, Constantin Kotsokalis, and Ulrich Winkler</td>
<td>A Framework for Multi-level SLA Management</td>
<td>Book chapter in: Handbook of Research on Non-Functional Properties for Service-Oriented Systems: Future Directions</td>
<td>2011</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Ulrich Winkler, Daniel Playfair, Wolfgang Theilmann</td>
<td>ERP B3: Service Level Driven Management of On-Demand Business Support Systems.</td>
<td>FIS 2010 (DEMO)</td>
<td>Sep-10</td>
<td>Submitted</td>
<td>Yes</td>
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<tr>
<td>Christoph Rathfelder, David Evans, Samuel Kounev</td>
<td>Predictive Modelling of Peer-to-Peer Event-driven Communication in Component-based Systems</td>
<td>EPEW2010</td>
<td>Sep-10</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Jens Happe, Henning Groenda, Michael Hauck, and Ralf H. Reussner</td>
<td>A prediction model for software performance in symmetric multiprocessing environments</td>
<td>QEST 2010</td>
<td>Sep-10</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Jens Happe, Dennis Westermann, Kai Sachs, and Lucia Kapova</td>
<td>Statistical Inference of Software Performance Models for Parametric Performance Completions</td>
<td>QoSA 2010</td>
<td>Jul-10</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Michael Hauck, Jens Happe, and Ralf H. Reussner</td>
<td>Automatic Derivation of Performance Prediction Models for Load-balancing Properties Based on Goal-oriented Measurements</td>
<td>MASCOTS 2010</td>
<td>Sep-10</td>
<td>Accepted</td>
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<td>Authors</td>
<td>Title</td>
<td>Conference/Journal</td>
<td>Date</td>
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<td>Lucia Kapova, Barbora Zimmerova, Anne Martens, Jens Happe, and Ralf H. Reussner</td>
<td>State dependence in performance evaluation of component-based software systems</td>
<td>WOSP/SIPEW ’10</td>
<td>Feb-10</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Dennis Westermann and Jens Happe</td>
<td>Towards performance prediction of large enterprise applications based on systematic measurements</td>
<td>WCOP 2010</td>
<td>Jul-10</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Dennis Westermann, Jens Happe, Michael Hauck, and Christian Heupel</td>
<td>The performance cockpit approach: A framework for systematic performance evaluations</td>
<td>SEAA 2010</td>
<td>Sep-10</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Alfonso Castro, Juan Lambea, Beatriz Fuentes, Sergio García</td>
<td>An SLA Management Framework for Telecommunication Services</td>
<td>TELECOM I+D 2010</td>
<td>Sep-10</td>
<td>Accepted</td>
<td>No</td>
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<tr>
<td>Christoph Rathfelder, Benjamin Klatt, Samuel Kounev, David Evans</td>
<td>Towards Middleware-aware Integration of Event-based Communication into the Palladio Component Model</td>
<td>DEBS2010</td>
<td>Jul-10</td>
<td>Accepted</td>
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<td>Name</td>
<td>Title</td>
<td>Conference/Book Chapter</td>
<td>Date</td>
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<tr>
<td>Christoph Rathfelder, Samuel Kounev, David Evans</td>
<td>Predictive Modelling of Peer-to-Peer Event-driven Communication in Component-based Systems</td>
<td>ECSA2010</td>
<td>Aug-10</td>
<td>Submitted</td>
<td>Yes</td>
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<tr>
<td>Wolfgang Theilmann, Ulrich Winkler, Jens Happe, and Ildefons Magrans de Abril</td>
<td>Managing on-demand business applications with hierarchical service level agreements</td>
<td>FIS 2010</td>
<td>Sep-10</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Christoph Rathfelder</td>
<td>Performance Modeling for Quality of Service prediction in service-oriented systems.</td>
<td>Book chapter in: Handbook of Research on Non-Functional Properties for Service-Oriented Systems: Future Directions</td>
<td>2011</td>
<td>Accepted</td>
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<tr>
<td>Franz Brosch, Heiko Koziolek, Bara Buhnova, Ralf Reussner</td>
<td>Parameterized Reliability Prediction for Component-based Software Architectures</td>
<td>QoSA 2010</td>
<td>Jul-10</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Costas Kotsokalis, Peter Chronz, Kuan Lu, Thomas Roeblitz</td>
<td>SLA-Based Planning for Multi-Domain Infrastructure as a Service</td>
<td>CLOUD 2010</td>
<td>Jul-10</td>
<td>Submitted</td>
<td>Yes</td>
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<tr>
<td>Authors</td>
<td>Title</td>
<td>Conference/Issue</td>
<td>Date</td>
<td>Status</td>
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<tr>
<td>Wolfgang Theilmann, Jens Happe, Costas Kotsokalis, Andy Edmonds, Keven Kearney and Juan Lambea</td>
<td>A Reference Architecture for Multi-Level SLA Management</td>
<td>JIE (Journal of Internet Engineering), special issue on SOI</td>
<td>Oct-10</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Carlos Bueno Royo, JuanLambea Rueda, Óscar L. Dueñas Rugnon, Beatriz Fuentes, Alfonso Castro</td>
<td>SLA BUSINESS TERMS Model for a Telecom Operator Business View of SLA</td>
<td>ICE-B 2010</td>
<td>Jul-10</td>
<td>Accepted</td>
<td>No</td>
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<tr>
<td>Thomas Schuster, Christoph Rathfelder, Nelly Schuster, Jens Nimis</td>
<td>Integrated tool support for iterative SOA evolution</td>
<td>SOAME2010</td>
<td>Mar-10</td>
<td>Published</td>
<td>Yes</td>
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<tr>
<td>Mathias Fritzsche, Wasif Gilani, Ralf Laemmel and Frédéric Jouault</td>
<td>Industrial Experiences related to Model Transformation Chains in Model-Driven Performance Engineering</td>
<td>Modellierung 2010</td>
<td>Mar-10</td>
<td>Published</td>
<td>Yes</td>
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<tr>
<td>Mathias Fritzsche, Wasif Gilani, Michael Thiele, Ivor Spence, T. John Brown and Peter Kilpatrick</td>
<td>A Scalable Approach to Annotate arbitrary Modelling Languages</td>
<td>Modellierung 2010</td>
<td>Mar-10</td>
<td>Published</td>
<td>Yes</td>
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<tr>
<td>Authors</td>
<td>Title</td>
<td>Conference/Journal</td>
<td>Year</td>
<td>Status</td>
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<tr>
<td>Lucia Kapova, Thomas Goldschmidt, Jens Happe, Ralf Reussner</td>
<td>Domain-specific Templates for Architectural Refinement Transformations</td>
<td>ECMFA 2010</td>
<td>Jun-10</td>
<td>Submitted</td>
<td>Yes</td>
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<tr>
<td>George Spanoudakis</td>
<td>Dynamic set-up of Monitoring Infrastructures for SLA Management</td>
<td>SLA@SOI Technical Paper</td>
<td>Jan-10</td>
<td>Published</td>
<td>No</td>
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<tr>
<td>Costas Kotsokalis, Philipp Wieder</td>
<td>Management Challenges of Automated Service Level Agreements</td>
<td>INGRID 2009</td>
<td>Jun-10</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Philipp Wieder, Ramin Yahyapour</td>
<td>Service Level Agreements in Grids</td>
<td>Encyclopedia of Software Engineering</td>
<td>2011</td>
<td>Accepted</td>
<td>Yes</td>
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<tr>
<td>Costas Kotsokalis, Ramin Yahyapour, Miguel Angel Rojas Gonzalez</td>
<td>SAMI: The SLA Management Instance</td>
<td>ICIW 2010</td>
<td>May-10</td>
<td>Published</td>
<td>Yes</td>
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<td>Marco Comuzzi, George Spanoudakis</td>
<td>Dynamic Set-Up of Monitoring Infrastructures for Service Based Systems</td>
<td>ACM SAC 2010</td>
<td>Mar-10</td>
<td>Published</td>
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<td>Marco Comuzzi, Wolfgang Theilmann, Gabriele Zacco, Christoph Rathfelder, Constantinos Kotsokalis, and Ulrich Winkler</td>
<td>Challenges in SLA Translation</td>
<td>NFPSLAM'09</td>
<td>Nov-09</td>
<td>Published</td>
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<tr>
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<td>Translation of Service Level Agreements: A Generic Problem Definition</td>
<td>NFPSLAM'09</td>
<td>Nov-09</td>
<td>Published</td>
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<tr>
<td>Jens Happe, Henning Groenda, and Ralf H. Reussner</td>
<td>Performance Evaluation of Scheduling Policies in Symmetric Multiprocessing Environments</td>
<td>MASCOTS 2009</td>
<td>Sep-09</td>
<td>Published</td>
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<tr>
<td>Andy Edmonds, Victor Bayon, Thijs Metsch</td>
<td>Using Cloud standards for interoperable Cloud Frameworks</td>
<td>SLA@SOI Technical Paper</td>
<td>Aug-09</td>
<td>Published</td>
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<td>Yih Leong Sun, Andy Edmonds, John Kennedy, Victor Bayon, Primoz Hadalin</td>
<td>SLA-aware Resource Management</td>
<td>CoreGrid 09 - Service Level Agreements in Grids Workshop 2009</td>
<td>August 24, 2009</td>
<td>Published</td>
<td>Yes</td>
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<tr>
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<td>Parametric Performance Completions for Model-Driven Performance Prediction</td>
<td>Performance Evaluation (Journal)</td>
<td>23rd July 2009</td>
<td>Published</td>
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<td>Hui Li, Giuliano Casale, Tariq Ellahi</td>
<td>SLA-driven Planning and Optimization of Enterprise Applications</td>
<td>Joint WOSP/SIPEW International Conference on Performance Engineering</td>
<td>Jan-10</td>
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<td>Jens Happe, Hui Li, and Wolfgang Theilmann</td>
<td>Black-Box Performance Models: Prediction based on Observation</td>
<td>1st International Workshop on the Quality of Service-Oriented Software Systems (QUASOSS)</td>
<td>Aug-09</td>
<td>Published</td>
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<td>Costas Kotsokalis, Ramin Yahyapour, Miguel Angel Rojas Gonzalez</td>
<td>Modeling Service Level Agreements with Binary Decision Diagrams</td>
<td>ICSOC/ServiceWave 2009</td>
<td>Nov-09</td>
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<td>Christof Momm, Michael Gebhart, Sebastian Abeck</td>
<td>A Model-Driven Approach for Monitoring Business Performance in Web Service Compositions</td>
<td>Fourth International Conference on Internet and Web Applications and Services (ICW 2009)</td>
<td>May-09</td>
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<td>Christoph Rathfelder, Samuel Kounev</td>
<td>Modeling Event-Driven Service-Oriented Systems using the Palladio Component Model</td>
<td>1st International Workshop on the Quality of Service-Oriented Software Systems (QUASOSS)</td>
<td>Aug-09</td>
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<td>Costas Kotsokalis, Philipp Wieder, Keven Kearney, Francesco Torelli</td>
<td>Service Level Agreements (SLAs) and Quality of Service (QoS)</td>
<td>NEXOF-RA 2nd RFP</td>
<td>2009</td>
<td>N/A</td>
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<td>Paolo Zampognaro, Francesco Torelli</td>
<td>Runtime Service Composition</td>
<td>NEXOF-RA 2nd RFP</td>
<td>N/A</td>
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<td>Gregor Berginc, Matej Artač, Gregor Pipan, Primož Hadalin, Bojan Grošelj, John Kennedy, Andrew Edmonds, Victor Bayon</td>
<td>Hierarchical Monitoring Services for Efficient Distributed System Management</td>
<td>NEXOF-RA 2nd RFP</td>
<td>2009</td>
<td>N/A</td>
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<td>John Kennedy, Andrew Edmonds, Victor Bayon, Yih Leong, Primož Hadalin, Hui Li</td>
<td>Infrastructure Usage and Management Interfaces – an SLA@SOI Perspective</td>
<td>NEXOF-RA 2nd RFP</td>
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<td>Franz Brosch, Jens Happe, Christof Momm</td>
<td>Design Time Service Composition</td>
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<td>Hui Li, Wolfgang Theilmann, Jens Happe</td>
<td>Challenges in SLA Translation</td>
<td>SLA@SOI Technical Paper</td>
<td>n/a</td>
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<td>Marco Comuzzi, George Spanoudakis, Costas Kotsokalis, Ramin Yahyapour</td>
<td>Establishing and Monitoring SLAs in Complex Service-Based Systems</td>
<td>7th IEEE Int. Conf. on Web Services</td>
<td>Jul-09</td>
<td>Published</td>
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<td>George Spanoudakis, Stephane LoPresti</td>
<td>Web Service Trust: Towards a Dynamic Assessment Framework</td>
<td>4th Int. Conf. on Availability, reliability, and Security (ARES'09)</td>
<td>Mar-09</td>
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<td>Heiko Koziolek, Franz Brosch</td>
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<td>2008</td>
<td>Published</td>
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<td>Proc. CAISE 2009 Forum, in conjunction with 21st Int. Conf. on Advanced Information Systems Engineering (CAISE 09)</td>
<td>08-Jun-09</td>
<td>Published</td>
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<td>24-May-09</td>
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<td>Researcher/Team</td>
<td>Title</td>
<td>Book in conjunction with Future Internet Assembly FIA 09. Title: Towards the Future Internet, Subtitle: A European Research Perspective. Publisher: IOSPress (<a href="http://www.iospress.nl/">http://www.iospress.nl/</a>)</td>
<td>Date</td>
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<td>Wolfgang Theilmann, Luciano Baresi</td>
<td>Multi-level SLAs for Harmonized Management in the Future Internet</td>
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<td>11-May-09</td>
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<td>Constantinos (Costas) Kotsokalis, Keven Kearney, Francesco Torelli</td>
<td>Service Discovery</td>
<td>NEXOF-RA 1st RFP</td>
<td>2008</td>
<td>N/A</td>
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<td>Christof Momm, Franz Brosch, Jens Happe, Hui Li</td>
<td>Towards Design-Time Performance Prediction with the Service Component Architecture (SCA)</td>
<td>NEXOF-RA 1st RFP</td>
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<td>John Kennedy, Terry Harmer, Karen Loughran, Andrew Edmonds, Victor Bayon, Joe Butler, Tariq Ellahi, Wolfgang Theilmann, Gregor Pipan, Gregor Berginc</td>
<td>Definition of Infrastructure Services – an SLA@SOI perspective</td>
<td>NEXOF-RA 1st RFP</td>
<td>2008</td>
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<td>John Kennedy, Terry Harmer, Karen Loughran, Andrew Edmonds, Victor Bayon, Joe Butler, Tariq Ellahi, Wolfgang Theilmann, Gregor Pipan, Gregor Berginc</td>
<td>Scalable Approaches to SOI – an SLA@SOI perspective</td>
<td>NEXOF-RA 1st RFP</td>
<td>2008</td>
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<td>A Model-Driven Approach for Monitoring Business Performance in Web Service Compositions</td>
<td>AQuSerM 08 workshop</td>
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<td>Published</td>
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<td>Wolfgang Theilmann, Ramin Yahyapour, Joe Butler</td>
<td>Multi-level SLA Management for Service-Oriented Infrastructures</td>
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<td>10 Dec 2008</td>
<td>Published</td>
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<td>Wolfgang Theilmann</td>
<td>Quality Considerations in SAP Architectures</td>
<td>CompArch 2008</td>
<td>14-Oct-08</td>
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## Appendix D: Partner-Specific Dissemination Strategies

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<th>Partner</th>
<th>Dissemination plans</th>
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<td><strong>City University London</strong></td>
<td>The strategy of City University is based on two broad activities, namely:</td>
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<td>• <strong>Education and training:</strong> City University offers a wide undergraduate and postgraduate portfolio of professionally accredited programmes. These programmes have a strong emphasis on the development and management of complex e-business solutions using industry standards and make use of two in-house industry funded labs: the SAP and the VODAFONE laboratories. The provision of these programmes incorporates innovative schemes of <strong>industrial placements</strong> of students including the professional pathway scheme whose students work full-time in University approved jobs that contribute to their educational experience along with their studies, and a postgraduate project scheme that is based on <strong>industrial internships</strong>. These mechanisms provide a framework for effective transfer of knowledge.</td>
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<td>• <strong>Industrial collaborations and technology transfer:</strong> City University has a long standing expertise in transferring research outcomes to the industry. Over the last few years, it has been engaged in several research and technology transfer activities funded by industry organizations including activities funded by Eurocontrol (EU), NATS (UK), Dstl (UK), BAE SYSTEMS (UK), Philips Research Labs (UK), UN-FAO (IT), and CSW (UK). Industrial contacts like these provide the basis for a proactive communication of the results of SLA@SOI.</td>
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<td><strong>Engineering Ingegneria Informatica S.p.A</strong></td>
<td>Engineering holds a leading position in the Italian IT market, providing mainly system and business integration projects and outsourcing services. Given this well defined business, Engineering with respect to the SLA@SOI objectives and expected results intends:</td>
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<td>1. to propose new paradigms and tools to manage the SLA to our customers in order to provide them more powerful and semantically rich instruments to handle their service oriented infrastructures;</td>
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<td>2. to offer the SLA@SOI solution to our Spago Suite developers (<a href="http://www.spagoworld.com">www.spagoworld.com</a>) in order to enhance with new functionalities and paradigms our open source products suite;</td>
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<td>3. to use the project results to provide specific training courses in order to increase the skill of our technicians in the other Company divisions and to increase the number of courses that our high formation school in Ferentino could provide;</td>
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<td>To emphasise the importance of SLA@SOI outcomes for</td>
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Engineering, it is worth to consider that the Italian government is currently adopting a policy to simplify and to automate the “bureaucratic functions” (a process driving to the Digitalization of the PAs) and Engineering has been invited by several Ministries to participate in a discussion table with the intent to define the reference architecture that will allow all the 20 Italian Regions to interoperate among them and the central PA by means of a SOA paradigm. We are confident that the results of SLA@SOI could definitely provide added value to the overall discussion and process.

| Fondazione Bruno Kessler | Fondazione Bruno Kessler (FBK) major goals are both scientific excellence and impact to the market and society. Its dissemination strategy is therefore twofold. From the one side, FBK will actively present the results through the scientific publications in top journals and conferences in the area of software and services. In particular, key people in the project are in the steering committee and in the program committee of the major international conference on service oriented computing (ICSOC). ICSOC will constitute one of the most effective means of dissemination of the research results of the projects through papers and the organization of workshops. From the other side, FBK has well-established collaborations with local SMEs, and will promote the results of the project through technology transfer projects. Special attention will be devoted to dissemination of results in the field of eGovernment, through current and future collaborations in national projects and with public bodies like CNIPA (Centro Nazionale per l’Informatica nella Pubblica Amministrazione). Moreover, FBK has launched a laboratory on Interoperability and eGovernment, the LEGO lab, which is open to research institutions and companies that want to invest in research and development in the area of eGovernment. As mentioned in the Case Study described in WP B6, eGovernment constitutes a significant test case for the result of the project, due to the special kinds of SLAs that can be established among public bodies, companies, and citizens. The project will take advantage of the LEGO lab to share results with research institutions and companies that are involved in the laboratory. |
| Forschungszentrum Informatik | Since Forschungszentrum Informatik (FZI) is an organization specialized in technology transfer of highly innovative solutions in the ICT sector, it has an extensive network of industrial partners, especially SMEs to whom it provides consultancy and training, but also targeted research and solution customization. The SLA@SOI project will be used to consolidate our position in the strategic domains of service-oriented software and quality of service. The results of the project will be directly incorporated in our consultancy activities for this sector and will constitute a valuable basis for future national and European research and development activities. The research group Software Engineering (SE) involved in the SLA@SOI project has a very close cooperation with the chairs of Prof. Dr. Oberweis, Prof. Abeck and Prof. Dr. Reussner at the University of Karlsruhe and will use these channels to |
| SLA@SOI | raise awareness for these topics in the academic world and to allow the results of the project to flow into lectures at the University of Karlsruhe (TH). FZI believes that closing the gap between expected competences of future ICT professionals and the education they receive in universities is the key to the success of the ICT industry in Europe in the years to come. |
| GPI S.p.A | GPI S.p.A is a small but very active player in the market of IT technologies for health-care and social welfare systems. The aim of the participation of GPI is focused on e-government solutions applied to the fields of e-health and welfare, with particular attention to the modelling, assessment and evaluation of SLA. One of the most important outcomes of the project for GPI is the adoption of advanced service-oriented approaches and methodologies by the company, and the possibility to offer products that include the advanced SLA-based techniques developed within SLA@SOI. Being partner of LEGO (the Laboratory of interoperability and e-Government in the Trentino Region), GPI intends to adopt this laboratory as a facility to disseminate the results of the project and to share them with academy and with other companies. |
| Intel | The Open Innovation Lab, Ireland, a part of the recently launched Intel Labs Europe, is chartered with engaging in open research in partnership with industry, academia, research institutions and public administration to advance the technical state of the art. The output of this research is used to inform both groups within Intel and the industry at large of potential technology directions. As well as influencing internal product development and internal ICT deployment efforts, opportunities will be sought to disseminate project output widely outside the company. Be it in custom presentations to external delegations to the innovation Open Lab, through engagement with open standards organisations, or publication of academic papers, Intel will seek to disseminate the outputs of SLA@SOI as broadly and effectively as possible. |
| Politecnico di Milano | Politecnico di Milano (PMI) is a research institution and its exploitation and dissemination interests are mainly concerned with the use of project results in courses at Politecnico, new consultancy opportunities (technology transfer initiatives) in cooperation with CEFRIEL (the IT centre of excellence at Politecnico), and presentation and publication of papers at the major international conferences (as well as tutorials and special-purpose workshops) and in the most prominent journals. The exploitable results of the project relevant for PMI are: (1) the experiences learnt in the definition, design, and implementation of the SLA@SOI framework; (2) the lessons learnt from tailoring the models and meta-models for predictable and manageable service-oriented systems; (3) the lessons learnt from the development of the industrial case studies. Exploitation actions related to consultancy services and courses will possibly start before the end of the project, but independently from the project itself. |
| SAP AG | Delivering business solutions OnDemand is a core pillar of the |
company strategy of SAP. This is important for better addressing small and medium size enterprise customers (which are themselves not able to host such large applications) but also the line of business of large organizations.

The outcome of SLA@SOI is of very high interest for SAP, in order to accelerate and realize its OnDemand vision. The automated SLA management that incorporates the whole stack starting from the customer SLA negotiation down to the infrastructure is a key contribution that SAP Research is trying to make.

The dissemination strategy of SAP addresses different stakeholders:

Customers and external partners are addressed in order to inform them about the research strategy and get in touch with them for collecting their feedback. A major channel used for this activity is the SAP Developer Network (SDN) but also public workshops such as the SLA@SOI information day. Also scientific events such as the Future Internet Symposium are quite relevant to teach a wider audience about the research activities and as a side effect used to increase the brand value of SAP.

The second major stakeholder group are SAP-internal development groups and even more important the product owners of certain areas. While these can be partially addressed via SDN we also plan for (and already did a couple of) dedicated internal workshops and whitepapers in order to reach them, such as the SAP Research Summit, the Performance Network, and the NetWeaver Lifecycle Forum.

Telefónica Investigación y Desarrollo SA (TID) is responsible for the Group’s strategic targets and critical technical areas and one of these is helping Telefónica to develop the management solutions needed to operate its services and networks. To have an adequate management infrastructure is of utmost importance in order to be able to respond to customer needs so as to keep a pre-eminent position in a very competitive environment.

Telefónica, as a service and network provider, is highly interested in maximising the revenue from its customer base but, at the same time, improving the quality perceived by customers and their satisfaction. In this sense, one subject need to be addressed, covering whole business interaction between service providers and customers from the commercial product definition to post-sale relationship. Therefore, TID plans to use SLA@SOI result to create a standardized business SLA model, interfaces and tools to cover the whole commercial lifecycle: Product definition, includes activities to create and update commercial products, Negotiation & Sale process, includes activities to customize a commercial product to specific customer, and Post-sale relationship includes activities and tools to monitor Business SLA signed and how it is carrying out in each moment for both parts.

TID is interested in translating business requirements to SOA/SOI worlds in order to offer any product/SLA grounded
on the capabilities of used services and infrastructure components.

TID recognizes the importance of contributions in specialized workshops, special journal issues and sessions at international conferences. Therefore, several different dissemination channels will be used:

- Original project results will be disseminated by writing research papers for major conferences and relevant IEEE magazines and journals
- A project web site will be established acting as a central contact point and providing additional background information about the project itself.
- In order to reach a broader academic and industrial audience, a workshop will be organized and tutorials will be given at major conferences.
- The material used in the tutorials will be further targeted to (part of) a book or electronic publication about the Next Generation Overlay Networks.

In addition, special issues in publications such as IEEE Communications Magazine will be organized focusing on specific subjects covered by the project.

| Dortmund University of Technology | The university of Dortmund is a scientific research partner. As such it participates in several projects and also works together in commercial projects with business partners. The group will use its expertise and connections to disseminate the project results within its scientific and commercial channels to provide wide adoption of the technology platform and to achieve sustainability of the results beyond the scope of the project. Based on the current scientific results and software products, the following collaborations are of special interest and are already used to disseminate SLA@SOI results towards other stakeholders:
- The German project SLA4D-Grid, lead by TUDO, currently evaluates the monitoring concepts produced by SLA@SOI.
- Requirements from SLA@SOI have been transferred to the Open Grid Forum's WS-Agreement group to be included in the definition of upcoming standards like WS-Agreement Negotiation.
- A project group at the TU Dortmund University dealing with Clouds is using results from the SLA@SOI work around the infrastructure provisioning.

Furthermore, SLA@SOI's SLA model has been incorporated into TUDO's training material and has been, for example, presented at the SSAl&E summer school.

TUDO will strengthen the aforementioned dissemination paths and constantly exploring new ones in the future. |
| XLAB | ISL is an online multimedia collaboration and support tool developed and sold by XLAB. In previous years we have integrated basic Grid functionality in the system, which allows us to be more reliable, and provide a higher degree of scalability of the system (this improvement was also a result of the knowledge gained in DeDiSys (http://www.dedisys.org) project. With this infrastructure we... |
are able to relay various media streams (audio, video, text, remote desktop) between end-points participating in the collaboration session. Relaying of these streams requires the relaying nodes to provide sufficient capabilities for unhindered, smooth multimedia experience: as an example, a node relaying real-time video or audio stream must provide sufficient bandwidth so that the end-user experience is not interrupted by large delays or jitter. The SLA@SOI project has a natural match with the requirements for media streaming, which we use in the product, and therefore we plan to extend the product to support multiple SLAs depending on the application, location and user. A second dissemination channel for the project will be the newest XLAB product - Phov, which will be publicly introduced shortly. In this product we rely on a stable service infrastructure, which has to meet the user expectation for the provided service. The SLA@SOI project will enable us to integrate the results into the service provisioning infrastructure and by doing so enable good user experience.

Due to the fact that we are the only Slovenian partner in the consortium we will also disseminate the results through papers presented in research conferences, congresses, journals and magazines, which will provide awareness of the project in the general public and at a national level.

Company has also history of publishing articles in local technological journals and magazines, and we plan to present the project results and efforts in a series of articles on the topic.

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<td>In the context of dissemination of SLA@SOI results within A1 Telekom Austria we find a significantly changed landscape. A1 Telekom Austria (A1TA) has recently combined its mobile (A1 Mobilkom) and fixed line (Telekom Austria) companies into a single corporate entity. Now undergoing a period of technical consolidation of many &quot;doubled&quot; systems, the current flux of large-scale architectural decision making provides a renewed opportunity to disseminate SLA@SOI techniques to the various transition task forces especially around the notion of holistic management of service aggregation. In numerous recent business development initiatives, we find ourselves increasingly involved in providing multi-tenant cloud compute facilities for client applications such as hosted email with virus checking for which the techniques and software of SLA@SOI have a clear application. In addition, the internally developed SLA reporting consolidation project for key accounts known as GrandSLAM shortly begins its second year of production operation. Accordingly, we are concentrating our dissemination activities as composed primarily of internally focused efforts to both maintain and create mindshare within the evolving corporate structure complemented by participation in selected externally-oriented events. More concretely we are currently:</td>
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<td>• &quot;shopping&quot; the B5 Service Aggregator demo with attendant presentations around at the various strategic architecture meetings to maintain and create visibility across the newly doubled organization</td>
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<td>• contacting the various technical groups responsible for virtualization/cloud technology products to analyze the current offerings and requirements for SLA service aggregation in relation to the capabilities of SLA@SOI derived applications</td>
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<td>• continuing to offer &quot;contrast and compare&quot; feedback to the GrandSLAM operational group on how SLA@SOI could be helpful in their evolution most notably by applying our model to their domain</td>
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### Appendix E: Standards

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<tr>
<td>Service Component Architecture (SCA)</td>
<td>OASIS</td>
<td>Different states, depending on the specification</td>
<td>Comprises large number of specifications</td>
<td>Service Component Architecture (SCA) is a set of specifications which describe a model for building applications and systems using a Service-Oriented Architecture (SOA). SCA extends and complements prior approaches to implementing services, and SCA builds on open standards such as Web services. SCA is based on the idea that business function is provided as a series of services, which are assembled together to create solutions that serve a particular business need. These composite applications can contain both new services created specifically for the application and also business function from existing systems and applications, reused as part of the composition. SCA provides a model both for the composition of services and for the creation of service components, including the reuse of existing application function within SCA compositions. SCA is a model that aims to encompass a wide range of technologies for service components and for the access methods which are used to connect them. For components, this includes not only different</td>
<td><a href="http://www.oasis-openecs.org/sca">http://www.oasis-openecs.org/sca</a></td>
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<tr>
<td><strong>Modeling and Analysis of Real-time and Embedded systems (MARTE)</strong></td>
<td><strong>OMG</strong></td>
<td><strong>OMG Adopted Beta Specification</strong></td>
<td><strong>Beta 2</strong></td>
<td>MARTE consists in defining foundations for model-based description of real time and embedded systems. These core concepts are then refined for both modeling and analyzing concerns. Modeling parts provides support required from specification to detailed design of real-time and embedded characteristics of systems. MARTE concerns also model-based analysis. In this sense, the intent is not to define new techniques for analyzing real-time and embedded systems, but to support them. Hence, it provides facilities to annotate models with information required to perform specific analysis. Especially, MARTE focuses on performance and scheduling analysis. But, it defines also a general framework for quantitative analysis which intends to refine/specialize any other kind of analysis.</td>
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<td><strong>Common Information Model (CIM)</strong></td>
<td><strong>DMTF</strong></td>
<td><strong>Preliminary</strong></td>
<td><strong>V2.3</strong></td>
<td>CIM provides a common definition of management information for systems, networks, applications and services, and allows for vendor extensions. CIM's common definitions enable vendors to exchange semantically rich management data.</td>
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The Web Services Agreement Specification (WS-Agreement) is a Web Services protocol for establishing agreement between two parties, such as between a service provider and consumer, using an extensible XML language for specifying the nature of the agreement, and agreement templates to facilitate discovery of compatible agreement parties. The specification consists of three parts which may be used in a composable manner: a schema for specifying an agreement, a schema for specifying an agreement template, and a set of port types and operations for managing agreement life-cycle, including creation, expiration, and monitoring of agreement states.

The WS-Agreement-Negotiation protocol will be used to negotiate and agree upon Service Level Agreements. It will enhance WS-Agreement beyond the simple "accept/reject" protocol and will allow complex negotiation scenarios as well as basic ones. It is work in progress without any draft existing yet.
Web Services Business Process Execution Language (WS-BPEL) | OASIS | Completed | V2.0 | Business processes can be described in two ways. Executable business processes model actual behavior of a participant in a business interaction. Abstract business processes are partially specified processes that are not intended to be executed. An Abstract Process may hide some of the required concrete operational details. Abstract Processes serve a descriptive role, with more than one possible use case, including observable behavior and process template. WS-BPEL is meant to be used to model the behavior of both Executable and Abstract Processes.

WS-BPEL provides a language for the specification of Executable and Abstract business processes. By doing so, it extends the Web Services interaction model and enables it to support business transactions. WS-BPEL defines an interoperable integration model that should facilitate the expansion of automated process integration in both the intra-corporate and the business-to-business spaces.

http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsbpel

Web-Based Enterprise Management (WBEM) | DMTF | Different states, depending on the specification | Comprises large number of specifications | Web-Based Enterprise Management (WBEM) is a set of management and Internet standard technologies developed to unify the management of distributed computing environments. WBEM provides the ability for the industry to deliver a well-integrated set of standard-based management tools, facilitating the exchange of data across otherwise

http://www.dmtf.org/standards/wbem
<table>
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<th>disparate technologies and platforms</th>
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<tr>
<td><strong>Web Services for Management (WS-Management)</strong></td>
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<td><strong>Java Management Extension (JMX)</strong></td>
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<td><strong>GLUE</strong></td>
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<tr>
<td>System Definition Model/System Modeling Language (SDM/SML)</td>
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<td>----------------------------------------------------------</td>
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<td>The Microsoft System Definition Model (SDM) and the cross-industry Service Modeling Language (SML) proposed by Microsoft and nine other leading vendors can be used to create models that capture the organizational and operational management knowledge relevant to entire distributed systems. SDM and its successor, SML, are key technical innovations of the Dynamic Systems Initiative (DSI), a technology strategy led by Microsoft to enhance the Microsoft Windows platform and deliver a coordinated set of solutions that dramatically simplify and automate how businesses design, deploy, and operate distributed systems.</td>
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<tr>
<th>Open Virtualization Format (OVF)</th>
<th>DMTF</th>
<th>Preliminary Standard</th>
<th>V1.1.1d</th>
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<tr>
<td>The Open Virtualization Format (OVF) Specification describes an open, secure, portable, efficient and extensible format for the packaging and distribution of software to be run in virtual machines.</td>
<td><a href="http://www.dmtf.org/standards/published_documents/DSP0243_1.0.0.pdf">http://www.dmtf.org/standards/published_documents/DSP0243_1.0.0.pdf</a></td>
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<tr>
<td>Web Service Distributed Management (WSDM)</td>
<td>OASIS</td>
<td>Completed</td>
<td>V1.1</td>
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