



**Title:** SLA-Ready Hub and Social Marketplace - first iteration

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**Date:** 23 December 2015

Revised version following Year 1 review. Submitted 29 April 2016



**Coordination and Support Action**

**Grant Agreement no:** 644077

**ICT-07-2014: Advanced Cloud Infrastructures and Services**

## Executive Overview

SLA-Ready is a European initiative driving a common understanding of service level agreements for cloud services with greater standardisation and transparency so firms can make an informed decision on what services to use, what to expect and what to trust.

The SLA-Ready **Common Reference Model** (D2.3, May 2016 and D2.4, December 2016) will benefit the industry by integrating a set of SLA components, such as common vocabularies, SLO metrics and measurements, as well as best practices and relevant standards needed to fill the gaps identified in the current SLA landscape.

Under **WP4 - Communications, Impact and Exploitation**, SLA-Ready supports small businesses (SMEs) with practical guides, encouraging them to carefully plan their journey to the cloud and make it strategic through an informed, stepwise approach, so the cloud and applications can grow with their business.

Under WP4, SLA-Ready will develop and incrementally roll out a cloud business hub and SLA marketplace featuring, among other content, tutorials-as-a-service and practical guides on cloud services and the entire SLA life cycle. The SLA Marketplace represents the practical implementation of the Common Reference Model, which builds on the requirements elicited by SLA-Ready in **D2.1 Requirements emerging from a state-of-the-art analysis** (June 2015) and **D2.2. Requirements emerging from a state-of-the-art analysis –Final Report** (December 2015).

**D4.2 SLA-Ready Hub and Social Market Place – 1<sup>st</sup> iteration** describes the design and rollout phases for the Cloud Business Hub and SLA Marketplace, tailored content creation, tools and services, as well as sustainability through integration into the CSA STAR (Security Trust and Assurance Registry) and CloudWatchHUB. It also defines key performance indicators to measure the impact of the hub and marketplace. D4.2 expands on and updates **D4.1 Communication and Dissemination Plan**, which defines the main actions for serving the target audiences of SLA-Ready with particular reference to developing the hub and marketplace. Based on our updated analysis of market gaps and the SLA landscape, we have decided to call to the “digital hub” as the **Cloud Business Hub** and the “Social Marketplace” as the **SLA Marketplace**.

In Annex 2, this document also provides a joint exploitation and sustainability plan for Year two of the project following Year one review recommendations.

In November 2016, **D4.3 SLA-Ready Hub and Social Marketplace - final iteration** will describe the evolution of the Cloud Business Hub and SLA Marketplace, reporting on the KPIs defined and core communication and dissemination impacts.

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## Document information

<b>Deliverable number</b>	<b>D4.2</b>
<b>Deliverable title</b>	SLA-Ready Hub and Social Marketplace - first iteration
<b>Deliverable Nature</b>	Report
<b>Deliverable dissemination level</b>	Public
<b>Contractual delivery</b>	31 December 2015
<b>Actual delivery date</b>	23 December 2015
<b>Author(s)</b>	Jesus Luna and Daniele Catteddu, Cloud Security Alliance
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<b>Reviewer(s)</b>	Neeraj Suri, TUDA
<b>Task(s) contributing to the deliverable</b>	Task 4.1 - SLA-Ready Digital Hub and Social Marketplace, Task 4.2 - Communications, outreach and tutorials-as-a-service, Task 4.3 - Socio-economic impact and exploitation of SLA-Ready outputs
<b>Target audience(s)</b>	Cloud Service Providers, Policy Makers, Standardisation Bodies
<b>Total number of pages</b>	35

## Disclaimer

SLA-Ready has received funding under Horizon 2020, ICT-07-2014: Advanced Cloud Infrastructures and Services. The information contained in this document is the responsibility of SLA-Ready and does not reflect the views of the European Commission.

## 1 Introduction

SLA-Ready aims to provide a service-oriented to cloud services and service level agreements that match the specific and evidence-based needs of the private sector in Europe. Meeting these needs is key to overcoming the different barriers to the uptake of cloud services, whether that be lack of knowledge or a lack of understanding of cloud contracts/SLAs.

### 1.1 Summary of main findings

Here we update our findings on major issues since the submission of D4.1 (M3 March 2015) and taking into consideration outputs of other SLA-Ready deliverables<sup>1</sup>.

- **Lack of knowledge:** For the 80% of organisations not yet using cloud services, insufficient knowledge is the main blocking factor (EuroStat).

Our interactions with the business community continue to highlight the general lack of knowledge about cloud computing, which represents one of the biggest barriers to adoption by small businesses.

To quote Eduardo Sanchez, Ametic – Spanish Trade Association as just one of many examples: *“Most SMEs (operating in different sectors) know very little about cloud computing. This knowledge is just the first step to adoption”*. The message is clear: businesses need a stepwise approach to cloud service uptake – a guided journey to the cloud.

**Slow adoption rates:** The major gaps between the strategic economic objectives for cloud service adoption and the current state of play have also been stressed recently in the context of the Digital Single Market, a clear sign that Europe is not making enough progress on the adoption of cloud services<sup>2</sup>.

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<sup>1</sup> D2.1, 2.2, 3.1, 3.2

<sup>2</sup> Compare, for example, Neelie Kroes, Vice-President of the European Commission responsible for the Digital Agenda, A European strategy for cloud computing, September 2012, [http://europa.eu/rapid/press-release\\_SPEECH-12-652\\_en.htm?locale=en](http://europa.eu/rapid/press-release_SPEECH-12-652_en.htm?locale=en). More recently, Andrus Ansip, Vice President for the Digital Single Market, European Commission, highlighted the need to address the low uptake of new technologies such as cloud as key to achieving the DSM. See [https://ec.europa.eu/commission/2014-2019/ansip/announcements/speech-vice-president-ansip-bruegel-annual-meeting-productivity-innovation-and-digitalisation-which\\_en](https://ec.europa.eu/commission/2014-2019/ansip/announcements/speech-vice-president-ansip-bruegel-annual-meeting-productivity-innovation-and-digitalisation-which_en). On the main actions for the Digital Single Market, see ‘Digital Single Market Strategy: European Commission agrees areas for action’, March 2015, [http://europa.eu/rapid/press-release\\_IP-15-4653\\_en.htm](http://europa.eu/rapid/press-release_IP-15-4653_en.htm), September 2015.

Providing companies with examples, success stories and user tips can go a long way in helping businesses identify similar business requirements and benefits across the entire private sector.

- **Lack of clarity:** Top barriers to adoption by small businesses are 1) lack of clearly defined terms and conditions 2) lack of pricing transparency, and 3) the lack of balance between the risks and responsibilities of the CSC and CSP<sup>3</sup>.

The implication is clear: many prospective CSCs find cloud services too complicated, too risky and too untrustworthy and prefer not to use cloud services. SMEs need specialised legal terminology and clauses, and checklists to evaluate the risks/responsibilities that prospective cloud customers have to undertake. Being in a better position to make trade-offs would make it easier to define a course of action as an essential ingredient for a carefully planned journey to the cloud.

- **Low uptake sectors:** Sectors like finance (banking, insurance, investment) are slow in adopting cloud services. There are several reason for slow adoption, such as 1) lack of awareness of the security benefits of the cloud; 2) lack of guidance from regulatory authorities; and 3) lack of transparency on security measures/investments on the part of cloud service providers.

ENISA<sup>4</sup> stresses the need for greater awareness of security risks and benefits, examples of cloud adoption and clearer guidance, and better tools for contract/SLA negotiation, especially for small financial institutions<sup>5</sup>.

Success stories provide good guidance and an example for financial institutions, supervisory authorities and CSPs that are still beginning their journey to the cloud. A key conclusion of the ENISA report is that “whenever the rules of the game are clear, more players are encouraged to participate.

- **Contractual complexities:** The SLA-Ready SME analysis of current Cloud SLAs and CSP practices (D2.1 & 2.2<sup>6</sup>) reveals many non-technical barriers. These barriers include the need for specialised legal terminology and clauses and the risks/responsibilities that prospective cloud customers have to undertake.

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<sup>3</sup> UK Federation of Small Businesses

<sup>4</sup> European Network and Information Security Agency

<sup>5</sup> ENISA, ‘Secure Use of Cloud Computing in the Finance Sector’, December 2015

<sup>6</sup> D2.1 & D2.2 Requirements emerging from a state-of-the-art analysis



Significant barriers run through the entire 7-phase life cycle defined by the consortium in D2.2. Indeed, many of the barriers come in the very first phases: “assessment/procurement”. Other issues include the lack of common, standardised approaches for locating the SLA with information scattered across different sections of the website, in different formats and with different clauses, making even the most basic comparison challenging.

Moreover, many of the clauses forming part of the service term agreement and the SLA are riddled with complex terminology, typically with self-preserving clauses for the CSP while shifting many of the risks on to the CSC, who is tasked with working out the implications by themselves.

- Our analysis of the SLA guides available online shows that the vast majority are almost exclusively tailored to large organisations equipped with an IT department. Such guides typically target Chief Information Officers, from both the public and private sector.

These barriers include the need for specialised legal terminology and clauses and the risks/responsibilities that prospective cloud customers have to undertake.

What is missing is a single access point to online practical guides specifically catered to small firms, complemented by a suite of dedicated tools and hands-on tutorials, e.g. webinars and “cloud clinics” to tackle issues that concern SMEs and large companies the most. Also missing is a specially tailored suite of business CSC accounts (user stories and user tips) that other firms can use as a guide in their evaluation of cloud services from a practical perspective, while also showing some general trends.

Such an approach can help build up a catalogue of cloud services available today, complemented by essential information on contractual/SLA information and different types of support available at different costs.

## 1.2 Small Businesses: Startups and SMEs

The importance of small businesses to the European economy is well-known<sup>7</sup>. The main target group of SLA-Ready are those many SMEs that (1) do not yet have a sufficient understanding of cloud services and realise the benefits of the cloud and (2) all SMEs that are typically offered “off-the-shelf” contracts with little to no power to

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<sup>7</sup> See, for example, a recent article on the importance of SMEs to the UK economy: <http://contractsit.com/small-companies-make-a-big-difference/>.

negotiate terms and conditions. Lack of knowledge and low acceptance of the typical CSP SLA “take-it-or-leave it” approach clearly represent major barriers for small businesses. Another issue is the inability to find practical guides and insider tips all in one place. Information on both these issues is dispersed across many different websites and documents, and, in the case of SLAs typically targets large organisations, especially CIOs.

In D4.1, we have defined key messaging and a plan (virtual and physical) for engaging, educating and empowering SMEs. Here we detail the types of tools and services we will provide to lower barriers to entry and increase understanding of SLAs so SMEs know what to use, what to do, and what to expect.

Needs the SLA-Ready Cloud Business Hub and SLA Marketplace can help satisfy:

- **An ABC of cloud computing:** a guide on different cloud services and the typical business benefits, guiding SMEs through the different phases of cloud procurement, usage and termination, e.g. identifying requirements, how to avoid common mistakes and giving SMEs a much clearer understanding of security, privacy, data management and personal data protection.
- **A clear understanding of Cloud SLAs:** Help SMEs breakdown the barriers to the many complexities of cloud SLAs. We aim to clarify legal clauses, and offer guides on risks and responsibilities, so they can make informed decisions and trade-offs based also on a clear understanding of what to expect and what to trust.

We will tailor our practical guides, tools and services specifically for small businesses with limited time and resources to spend on evaluating cloud services and their respective SLAs.

The SLA-Ready Cloud Business Hub and SLA Marketplace aim to fill these gaps not just through the tools and services we will provide and integrate but especially in creating those very milestones a company needs to reach before it becomes “cloud and SLA ready”.

### 1.3 Large Companies

SLA-Ready mainly targets large companies that have concerns, perceived or real, about security and privacy, including regulated industries. A recent ENISA report highlights the need to raise much greater awareness of security benefits of the cloud, assist companies in making risk assessments, and help bridge the gap between the supply and demand sides (as well as regulators, where relevant).

The ENISA December 2015 report highlights the need to promote more widely risk assessment frameworks and tools to reduce misconceptions about the security benefits of the cloud.

- **Key insights:** SLA-Ready has a role to play in breaking down misconceptions about cloud security risks and opportunities by offering insightful snapshots from existing frameworks and studies, both technological and sector-based.
- **Guides and tools on security** can help breakdown misconceptions about the cloud, and turn current obstacles into opportunities for good practices in the private sector across sectors that are important to the European economy, such as finance, health and transport.

#### 1.4 Cloud Service Providers

The SLA-Ready state-of-art analysis (D2.2) has been vital in revealing the current practices of cloud service providers with regard to service level agreements, and more generally cloud contracts. This is also an opportunity to clarify the services in terms of security and privacy, SLA aspects and life cycle.

Placing attention on major concerns and requirements on the customer side is an opportunity for cloud service providers to strengthen their service offers to enable more companies to start or advance their journey to the cloud. SLA-Ready will also highlight the need for standardised SLA metrics for all users along with ways to ensure enforcement and with greater transparency throughout as crucial to increasing adoption.

#### 1.5 Roadmap for the rollout of the Cloud Business Hub and SLA Marketplace

The figure below illustrates the roadmap for rolling out the cloud business hub and SLA marketplace, showing how sustainability and exploitation plans fit into the master plan.



**Figure 1. Rollout of Business Hub & SLA Marketplace**

The rollout of the marketplace, the production of online and multimedia content and the development and integration of tools will be continuously monitored with SMEs and their representatives to ensure SLA-Ready is speaking the right language. Feedback will also be collected during events.

## 1.6 Structure of the Document

The rest of this document is structured as follows:

- Section 2 introduces the Cloud Business Hub and Marketplace,
- Section 3 discusses the proposed integration of SLA-Ready's outcomes with both CSA STAR and CloudWatchHUB,
- Section 4 outlines how social media activities can support the promotion of the Cloud Business Hub and Marketplace
- Section 5 presents the proposed Key Performance Indicators,
- Section 6 presents the partners' exploitation plans,
- Section 6 summarizes the conclusions of this deliverable,
- Finally, Section 7 summarizes the conclusions of this deliverable.

## 2 *Rollout of the Hub and Marketplace*

This section introduces the basis and content focus of both Cloud Business Hub and Marketplace.

### 2.1 Content Focus

#### 2.1.1 Content focus of the Cloud Business Hub

To create clear a path towards cloud uptake, SLA-Ready will incrementally roll out a **Cloud Business Hub** offering a stepwise practical, hands-on guide and insider tips. Because small firms cannot negotiate the SLA, we are designing the Business Hub to help lower the entry barrier from the very outset.

A key feature of the business hub is therefore to support the most typical approach that small businesses take in their journey to the cloud, drawing on feedback from SMEs and their representative organisations.

Our aim is to assist small businesses in selecting a cloud service, give them a better indication of what to expect when using it and greater awareness of issues such as security and privacy.

Our approach is not to “re-invent the wheel” but to assess, and where necessary adapt and update, existing tools and services developed in Europe or elsewhere.

SLA-Ready is well placed to empower small businesses by offering vital insights into how to deal with all aspects related to the SLA and SLOs, the contractual clauses, and coverage (or lack of it) on security, privacy, data management and data protection.

Our plan for rolling out the SLA marketplace is to provide small businesses with an incremental guide to SLAs. Again, our approach is not to “re-invent the wheel” but to integrate tools and other existing guides that can facilitate small businesses

#### **Guides & Services to the cloud**

In addition to the tools and services described below, SLA-Ready will embed a glossary of key terms based on the final state-of-the-art analysis (D2.2) but explained in layman’s term. Relevant terms will be linked from the online texts as relevant with a full set of terms also provided.

- **Your Essential Business Guide to Cloud Computing:** concise overview of cloud services with examples of cloud service providers. Key differences across the different services, especially in terms of the respective roles and responsibilities on the part of the cloud service customer and the cloud service provider.

→ **IMPACT:** Clearer and better understanding of cloud services. The guide will also inform briefings and webinars as a first introduction to cloud services.

- **User Stories:** cloud customer contributions on how services they are benefitting from the cloud across different sectors. The user stories include life-giving properties for start-ups and micro businesses that are lowering the entry barrier to almost any sector. The user stories will also cover examples of the Internet of Things wherever the cloud is a fundamental enabler.

→ **IMPACT:** SMEs see real-world examples for cloud service usage, helping them identify with similar business requirements and benefits. They also get.

**User Tips:** The user tips are accounts of real-world experiences with cloud services, including important lessons learnt so other businesses can avoid repeating them.

→ **IMPACT:** Peer-2-peer practical insights means SMEs can pick up useful practical tips about what to expect and what to avoid when using a given cloud service.

**Open Forum:** The aim of the open forum is to encourage the business community to ask questions about their concerns about 1) moving to the cloud and 2) cloud service level agreements through a peer-2-peer approach.

→ **IMPACT:** A dynamic service to share concerns, experiences and best/good practices, including the marketplace tools and services.

- **Guide on security and privacy in the cloud:** insights on the risks and opportunities associated with different cloud services, drawing on existing work in field and linking to existing tools (e.g. ENISA and EU-funded projects).

→ **IMPACT:** SMEs understand the risks involved when using a given cloud service. They will gain a clear understanding of the responsibilities they need to take, as well as opportunities to improve their security posture.

- **Your Legal Guide to the Cloud:** guide to the legal aspects of cloud service contracts, including the European Data Protection framework and compliance, and updated accordingly. This block will also feature relevant videos from VieuWs.

→ **IMPACT:** Increase awareness of the legal aspects drawing on the state-of-the-art analysis and external sources. Increase understanding about compliance, which is currently very low in the European business community.

Examples of ENISA guides and tools SLA-Ready will leverage and promote include:

- SME Cloud Security Tool<sup>8</sup> and related report – extracting key insights and tips.
- Cloud Computing Security Risk Assessment<sup>9</sup> as a helpful tool for developing a corporate risk assessment for cloud computing.
- Network and Information Security in the Finance Sector<sup>10</sup> – reducing fragmentation with common and shared guidelines for operating in a pan-European market.

### 2.1.2 Content focus of the SLA Marketplace

The SLA-Ready Marketplace is the main entry point for supporting SMEs in understanding and managing cloud SLAs. We aim to achieve this by ensuring the project outputs find a practical implementation and by structuring content around the specific needs of SMEs. Practical guides also include webinars and hands-on events.

D4.2 relates to tasks taking place in WP2 (Definition of a common reference model) and WP3 (International Cooperation, Consensus, and Standardisation), as showed in the figure below. The main outcomes of WP2, in particular the common reference model, is a foundational output for the SLA marketplace, where WP4 will adapt it for both the business community and CPSs.

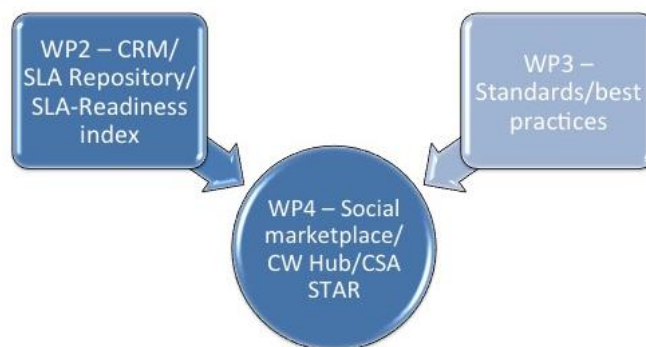


Figure 2. WP2 and WP3 inputs for this Deliverable 4.2

<sup>8</sup> <https://www.enisa.europa.eu/activities/Resilience-and-CIIP/cloud-computing/security-for-smes/sme-guide-tool>.

<sup>9</sup> <https://www.enisa.europa.eu/activities/risk-management/files/deliverables/cloud-computing-risk-assessment>.

<sup>10</sup> <https://www.enisa.europa.eu/activities/Resilience-and-CIIP/nis-in-finance/network-and-information-security-in-the-finance-sector>.



An example of a WP2 output is the SLA Readiness Index (D2.3), which will be applied to the SLA repository (D2.1 and D2.2) with the aim of improving the CSP information contained in the CSA STAR repository.

Activities taking place WP3 have resulted in a focused set of standards and best practices related to Cloud SLAs, including initiatives from ISO/IEC, NIST, ETSI and CSA. WP4 is tasked with making them available to CSPs (standards directory) and translating their benefits to SMEs, including insights into their implications. The ultimate aim is to help business CSCs their role in the SLA-Ready Common Reference Model.

The table below summarises the main SLA-Ready outputs and their relevance to WP4. It is important to note that considerable effort into taking the outputs and putting them into well-packaged content (including interactive tools) for SMEs.

SLA-Ready Outputs	SLA Marketplace
<b>December 2015:</b> D2.2 State-of-the-art Analysis – Final Report	This final report expands on the initial analysis (D2.1), drawing also on feedback from the Advisory Board. It will feed into the SLA Marketplace by tailoring relevant sections to the business community
<b>December 2015:</b> D3.2 Standardisation and International Cooperation Initial Report	Reports on the main standardisation and internationalisation activities carried by SLA-Ready, identifying best practices and gaps in the SLA landscape
<b>May 2016:</b> D2.3 Common Reference Model to describe, promote and support the uptake of SLAs	Benefit the industry by integrating a set of SLA components, such as common vocabularies, SLO service metrics and measurements
<b>December 2016:</b> D2.3 Common Reference Model to describe, promote and support the uptake of SLAs – Final Report	Benefit the industry by integrating relevant updates into the SLA Marketplace
<b>December 2016:</b> D3.3 A Business Guide to Service Level Agreements: How to be a well-advised user of cloud services. An initial version will be made available in late September 2016.	This deliverable will report on the integration into the SLA-Ready Cloud Business Hub & SLA Marketplace of user-friendly guide to the legal, technical and socio-economic frameworks, regulations and compliance aimed at facilitating the uptake of SLAs in the private sector.

**Table 1. SLA-Ready Outputs and WP4 Re-packaging**

#### Examples of other relevant outputs and synergies

- **EC Standardisation Guidelines**, June 2014: offers an excellent platform to build a comparison sheet for assessing the relevance of purchasing a cloud service and comparing relevant CSP offers.



- **SPECS<sup>11</sup>**: Secure Provisioning of Cloud Services based on SLA Management and tools for negotiating security SLAs.
- **CUMULUS<sup>12</sup>**: finalised EU FP7 project on the topic of continuous cloud monitoring and its relationship with SLAs.
- **A4Cloud<sup>13</sup>**: EU FP7 project discussing the notion of accountability and its importance to cloud certifications, contracts and SLAs.
- **SLAlom<sup>14</sup>**: model terms and specifications and machine-readable tools.

Content design will enable real understanding of cloud services based on a stepwise approach. Navigation therefore reflects the different parts of a typical SME's journey to cloud adoption, where content in the blocks can be interlinked to point visitors to tools on the cloud and service level agreements developed by other initiatives. The only conditions for integration of external tools are: 1) relevance and 2) usability. At the same time, we avoid duplication of effort.

In the sections below we detail the content creation for the cloud marketplace and then for the SLA marketplace, indicating the expected impact based on our sociological analysis (D2.1, updated and expanded in D2.2) and our interactions with the European business community. In the first rollout of the marketplace, the best/good practices are highlighted as relevant in the individual blocks, whereas subsequent rollouts will include a dedicated section.

Most of the content will be based on different entry levels such as the level of technical knowledge and experience of cloud services.

The Entry Test to the SLA Marketplace will a core set of questions to guide users to the most relevant sections based on their starting levels, for example: Q1: Do you and/or your employees have different IT skills? Q2: What type of support do you require, e.g. technical or contractual/legal?

This initial block on the marketplace will feature the following online and multimedia content, with the goal of helping cloud customers produce their own checklist.

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<sup>11</sup> <http://www.specs-project.eu/>.

<sup>12</sup> <http://www.cumulus-project.eu/>.

<sup>13</sup> <http://www.a4cloud.eu/>.

<sup>14</sup> <http://slalom-project.eu/>.

**Your Essential Guide to Cloud Service Level Agreements:** A walkthrough a typical cloud service level agreement with pointers on what current and prospective customers should pay particular attention to. This will include the SLA-Ready webinar “How to negotiate a Cloud Contract”, and any other and future multimedia tools. It will also integrate any other relevant tools available, e.g. for monitoring performance.

Small businesses have expressed the need to match their requirements (including business and technical aspects of the service) with the responsibilities and actions they need to take as a CSC. They also need to identify the most relevant Service Level Objectives (SLOs), addressing performance, security, privacy and legal aspects in an SLA.

→ The purpose of the essential guide to cloud contracts/SLAs is to clarify the complex SLA terms and terminology and propose a structured way to guide the SMEs in evaluating the expected service provision.

This approach stems from the ENISA “*Cloud Security Guide for SMEs*” and builds on their practical approach of focusing on the security risks and opportunities of different types of cloud services. The marketplace will link to the SME tool so they can come up with a security checklist for the actions they need to take before actually using the chosen service.

The rationality behind this builds on the need to well-define Service Level Objectives unambiguously to establish a clear communication between cloud service providers and their prospective customers. Moreover, this guideline shall help customers to understand the specific elements of a service to map them with a standardised set of SLOs, thus helping them to forecast the potential risk exposure for their business if these terms are not included in the contract.

Section 4 of D2.2 identifies a list of requirements for the SLA-Ready Common Reference Model (CRM) from community best practices, including standardisation bodies and EU FP7/H2020 projects. We leverage this work to group the most relevant requirements from a technical perspective in categories shown in following Table.

Category	SLO	Reference in D2.2
Performance	Response Time	Section 3.2 pag. 28
	Capacity	Section 3.2 pag. 28
	Elasticity	Section 3.2 pag. 28
	Resources availability	Section 3.3.6
Fault tolerance & incidents	Service Resilience	Section 3.2 pag. 29

Category	SLO	Reference in D2.2
management	Customer data backup/restore	Section 3.2 pag. 30
	Disaster recovery	Section 3.2 pag. 30
	Level of redundancy	Section 3.3.8 pag. 47
	Recovery point & time	Section 3.3.10 pag. 50
	Incident management	Section 3.3.9 & Section 3.3.13
Security	User authentication and identity assurance level	Section 3.3.3 pag. 36
	Mean time required to revoke a user	Section 3.3.3 pag. 37
	Password storage protection level	Section 3.3.3 pag. 37
	Use of client certificates for authentication	Section 3.3.3 pag. 37
	Cryptography attributes	Section 3.3.4
	Tenant isolation level	Section 3.3.7 pag. 46
	Provider's multi-tenancy support	Section 3.3.8 pag. 47
	Data deletion	Section 3.2 pag. 32
	Data deletion quality level	Section 3.3.8 pag. 46
Legal & Privacy aspects	IPR	Section 3.2 pag. 30
	Data deletion	Section 3.2 pag. 32
	Data deletion quality level	Section 3.3.8 pag. 46
	Law Enforcement Access	Section 3.2 pag. 33
	Country level anchoring	Section 3.3.10 pag. 49
	Data minimisation	Section 3.3.15 pag. 55

Table 2. Service level objectives

→ **IMPACT:** Setting the business customer in the right direction is fundamental for making an informed decision about all aspects of the cloud but especially the service level agreement as a critical interface with the provider.

- **FAQ: What's an SLA?:** Our analysis shows that non-technical business people are not always know what a service level agreement. This online service provides straightforward background information as the very basis for walking businesses through the SLA life cycle.

As an example of the applicability of this guide we draft below some questions for the SMEs relevant to understand the important aspects of the SLA they should consider.

*Q1: Do your employees have different IT skills and different authentication capabilities?*

Be sure that your CSP provides identity assurance levels to require strong authentication when accessing sensitive resources.

*Q2: Does your service need to accommodate different peak demand of resources?*

A2: Elasticity is what you need.

*Q3: Should your service work in real-time?*

A3: You need to look at the Response Time.

*Q4: Is your service built on critical data that you cannot afford to lose?*

A4: You need to check that your CSP provides Fault tolerance solutions like “Customer data backup/restore” functionalities and negotiate the “Level of redundancy”. Please note that replicas of your data might have an additional cost.

*Q5: Does your company manage sensitive data?*

A5: You need to ensure that your provider offers secure data deletion and minimisation capabilities when you do not need your data any more.

→ **IMPACT:** Breaking down the initial barriers to cloud service level agreements, in a straightforward way and without making any assumptions about the knowledge a cloud customer has.

**FAQ: What's the SLA life cycle?:** Drawing on the state-of-the-art analysis, this section will walk cloud business users through the SLA life cycle identified and analysed by SLA-Ready.

→ **IMPACT:** Cloud business customers will know what to do and what to expect at each phase of the life cycle, meaning they can plan their use of the services much more carefully and know what steps to take if something goes wrong. This will help businesses become “SLA-Ready”, reducing the conspicuous complexity not only of the state of practice vocabulary but also of the proposed terminology in standardisation.

**Best Practices:** This section will explain current best practices in the cloud industry, such as standardisation and industry-led initiatives.. It will also offer unique SLA-Ready insights

into what different standards mean for the demand and supply sides, drawing also on the already established Advisory Board and Supporters as they are recruited over time.

→ **IMPACT:** Demystifying technical standards and offering a practical approach to cloud (security) SLAs.

### 2.1.3 General features of the hub and marketplace

The web portal will also include a number of general sections which could include content relevant to both the business hub and the marketplace. Content will be tailored for the target audience and are listed below.

**Tech Trends:** a dynamic news service offering insights on cloud industry trends, on the Internet of Things and on 5G as key technologies in the emerging landscape. This service will highlight which businesses (large and small) are innovating in this space and show how it is evolving. Information will be sourced from IT and telecom media channels with “Monthly Wraps” shared through the forthcoming SLA-Ready newsletter service.

**Webinars:** In addition to the SLA-Ready webinars (tutorials-as-a-service), we will publish a selection of other useful webinars for the private sector. Examples include popular business applications, e.g. MS 365, Other webinars can help our target communities understand compliance with European data protection. Webinars will be sourced from the Cloud Security Alliance and VieUws, and tagged to match different target audiences and linked from relevant sections on the hub and marketplace.

**Cloud Clinics:** are focused events (briefings) and/or webinars aimed at addressing the biggest barriers to cloud service adoption starting in 2016. This service will be offered in conjunction with selected cloud events and widely promoted to the business community.

**Knowledge Hub:** This service will select the most important reports and surveys on cloud computing, including legal and security issues for any user of the marketplace looking for a more in-depth analysis. We will provide a brief overview of each report and indicate the target audiences it is intended for.

**Policy Pulse:** This section will provide policy updates on cloud computing and the legal framework so business can stay up to speed on compliance and other essential information they need.

**Advisory Board:** This is a showcase for the members of our Advisory Board, offering a space for them to share insights on the cloud and related topics, with particular reference to best/good practices.



**Supporters:** This is an area to share the views of the supporters SLA-Ready is recruiting mainly through LinkedIn, offering a variety of opinions and trends that we can share with the SLA-Ready business community.

### 3 Integration and Back-linking to the SLA Marketplace

This section presents the proposed integrations plans of the SLA Marketplace with CSA STAR and CloudWatchHUB.

#### 3.1 Integration with CSA STAR Registry

In early 2013 the Cloud Security Alliance released its certification scheme called Open Certification Framework (OCF) – STAR. Today, the CSA OCF-STAR has become the industry’s most powerful programme for security assurance in the cloud.

OCF-STAR consists of three levels of assurance which currently cover four unique offerings all based upon the Cloud Controls Matrix (CCM<sup>15</sup>), a comprehensive list of cloud-centric control objectives. The first level of assurance, known as CSA OCF-STAR Self Assessment, documents the security controls provided by various cloud computing offerings thereby helping users assess the security of CSPs they currently use or are considering using. In order to achieve OCF-STAR Level 1, cloud providers either submit a completed Consensus Assessments Initiative Questionnaire (CAIQ<sup>16</sup>) or a report documenting compliance with CCM. This information then becomes publicly available in the STAR registry<sup>17</sup>, promoting industry transparency and providing customer visibility into specific provider security practices.

The STAR registry is a publicly accessible repository designed for users of cloud services to assess their cloud providers, security providers and advisory and assessment services firms in order to make the best procurement decisions. It is noticeable that these goals are fully aligned with SLA-Ready’s mission to increase trust and transparency in the cloud ecosystem through SLAs. In consequence, SLA-Ready has developed synergies between its SLA Repository (WP2) and the CSA STAR registry just as presented in the rest of this section.

As presented in Deliverables 2.1 and 2.2 in order for the CSA STAR registry to exploit the information from the SLA Repository, it is required to present the data associated to the SLA assessments in a more compact and easy to understand manner. The chosen format was the “SLA-Readiness index”, a qualitative indicator showing the compliance of a given Cloud SLA with respect to the SLA-Ready’s CRM. More technical details related to the SLA-Readiness index will be presented in Deliverable 2.3.

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<sup>15</sup> <https://cloudsecurityalliance.org/group/cloud-controls-matrix/>.

<sup>16</sup> <https://cloudsecurityalliance.org/group/consensus-assessments/>.

<sup>17</sup> [https://cloudsecurityalliance.org/star/#\\_registry](https://cloudsecurityalliance.org/star/#_registry).



A high-level view of the process developed to integrate the SLA-Readiness index into the CSA STAR Registry is shown in the figure below. In Step 1, the CSP registers its CAIQ/CCM self-assessment into OCF-STAR following the current process established by CSA. During Step 2, the SLA from this CSP is assessed and entered into the SLA Repository<sup>18</sup> following the criteria defined in Deliverable 2.3. Before computing the SLA-Readiness index corresponding to the CSP SLA, in Step 3 the data from the SLA Repository is aggregated and qualified thanks to the “SLA Reasoner” techniques introduced also in Deliverable 2.3. The outcome from the SLA Reasoner is the actual SLA-Readiness Index (Step 4), which then becomes part of the CSP’s entry<sup>19</sup> on the STAR Registry (Step 5).

The process described in this section solves the problem of populating information from the SLA-Repository into the STAR Registry, while keeping it compact and easy to understand. However, cloud customers willing to obtain more information related to their CSPs will also have a link from the STAR Registry back to the SLA-Repository and the social marketplace (cf., Section 3.2), where they may even have access to the raw data used for computing the SLA-Readiness index.

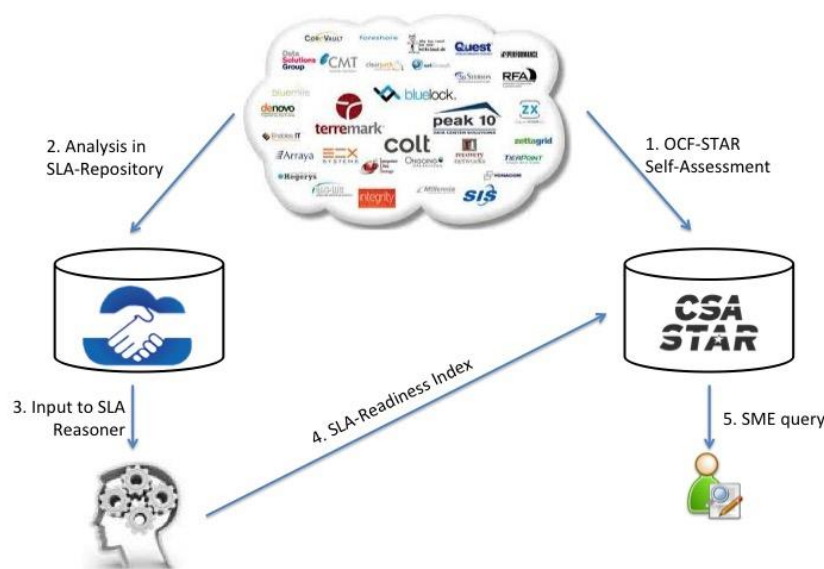


Figure 3. Usage of the SLA-Readiness index into the CSA STAR registry.

Aligned to the deployment roadmap for the SLA Repository (D2.2), in the table below, with the proposed timeline for the integration of the SLA-Readiness index into CSA STAR.

<sup>19</sup> With the previous consent of the CSP.



Planned release date	Milestone	Access Restrictions	Comments
Q4/2015	Initial version of SLA Repository	Only to members of the consortium	Initial version of the repository based on the final set of CRM requirements (cf., Deliverable 2.2).
Q1/2016	Initial set of analyses (at least 40 CSPs)	Only to members of the consortium and assessed CSP	This version of the SLA Repository contains assessment data of at least 50 CSPs as produced by the consortium. CSP validation starts.
Q2/2016	Proof of concept SLA-Readiness index computation	Only to members of the consortium	Based on techniques and criteria presented on Deliverable 2.3
Q3/2016	Initial integration with CSA STAR	Only to members of the consortium	Proof of concept SLA-Readiness index integrated into CSA STAR.
Q4/2016 – Q1/2017	Validated SLA information in CSA STAR (at least 15 CSPs)	Publicly available (read-only)	Initial set of CSPs has validated the results of the SLA analysis, and gave their consent to publish online in CSA STAR.

**Table 3. Proposed timeline for integration into CSA STAR**

### 3.2 Back-Linking from the CloudWatchHUB

The CloudWatchHUB, [www.cloudwatchhub.eu](http://www.cloudwatchhub.eu), is increasingly recognised as ‘the’ pan-European cloud observatory with a suite of tools and services for SMEs complementary to SLA-Ready. The focus of CloudWATCH (phase two started in September 2015) is now on the rollout to market of European cloud, software and services, risk management, and cloud pricing. By linking the tools and services developed and integrated by SLA-Ready, CloudWatchHUB can expand its offer as part of its drive towards a sustainable service.

The table below outlines the mutual benefits of linking the SLA marketplace to the CloudWatchHUB.

Tool/Service	Added Value for the CloudWatchHUB
Essential Guide to SLAs	Provides a missing piece to current and future essential guides for the business community.
Essential Guide to Security and Privacy in Cloud SLAs	Provides insights into security and privacy issues within the cloud SLA, again enhancing current and future CloudWATCH2 services.
Guide to SLA Standardisation	Provides timely updates on Cloud SLA standardisation efforts for publication on the newly developed cloud standards hub, which will also draw on CloudWATCH2 standardisation activities, and those of Cloud and software, and services projects.

SLA Repository & Readiness Index	Helps prospective business cloud service customers to identify cloud service providers that fit their specific needs. CloudWATCH2 will consider the feasibility of developing extensions based on the SLA Repository to include relevant new services being rolled out by European projects.
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Table 4. SLA-Ready Tools & Services for the CloudWatchHUB

#### 4 Social Media and Community Building

In D4.1, we have explained the strategy for building the SLA-Ready community. Here we briefly describe the actions we will take with regard to the Hub and Marketplace. SLA-Ready will actively promote the tools and services on offer in the marketplace to its growing community on twitter and LinkedIn. The figure below shows tweets on peer-2-peer learning and tech trends, as an example of how we plan to move forward.

Follow us on Twitter

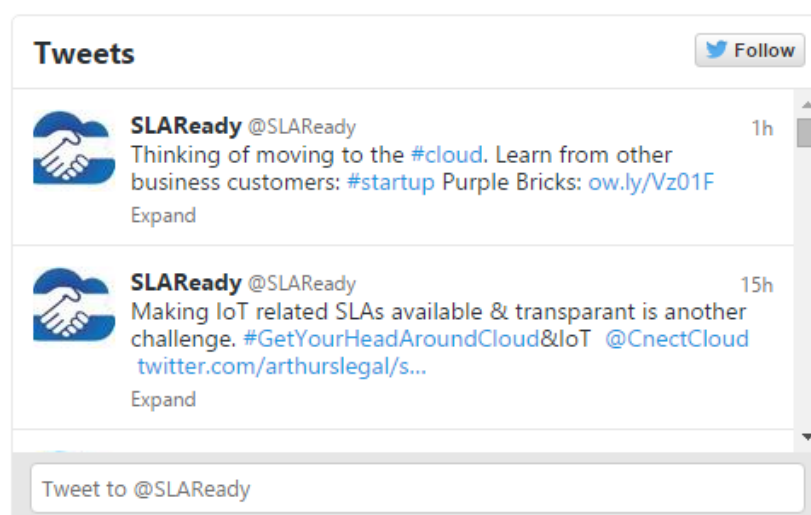


Figure 4. A sample of SLA-Ready Tweets

A key activity in building up the community is sourcing start-up and SME multipliers that can help spread the word about our tools and services as they evolve over time. This includes establishing synergies with multipliers and European chapters of the Cloud Security Alliance for events, especially the Cloud Clinics.

The table below provides a sample of channels sourced since the production of the Communication and Dissemination Plan (April 2015), excluding individuals.

<b>Start-up Multipliers</b>	@StartUpEU   @StartupUK, @StartUpBritain   @StartupsBe   @Sbootcamp   @iMinds   @BeTech_   @Allied4Startups
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	@STARTUPLISBOA
<b>SME Multipliers</b>	@EIT_Digital   @UEAPME   @innovateuk, @techUK   @BITMi   @Swedishenterp   @Kommerskoll   @VNO_MKB_Brussel   @isme_ie   @ISBC_global   @EEN_EU   @AlternativaPME   @Irish_Biz   @AgorianI   @AMETIC_es   @EstoniaInvest   @EUBIC
<b>Standards Multipliers for SMEs</b>	@sbs_sme, #Standards4SMEs   @Standards4EU General promotion of standards: @ISOstandards   @IECstandards   @ETSI_STANDARDS
<b>Media Channels</b>	@ComputerWeekly   @IoTWeeklyNews   @TelecomTV   @Inside5G

Table 5. Sample of Multiplier Channels for Small Firms

## 5 Key Performance Indicators

SLA-Ready will use the following key performance indicators (KPIs) to measure the impact of the hub and marketplace, as well as communication and outreach activities. SLA-Ready measures the KPIs quarterly using a tool to measure monthly results against end-of-project targets ('flash report'). Monthly plans are used to define the main activities to be carried out by partners to reach the targets set.

**KPI 4.1 SLA-Ready Hub:** This KPI measures the impact of the hub and marketplace by analysing metrics such as unique visitors, page views, popular pages, downloads/views of business guides and tips. It also profiles users in terms of country provenance and behaviour.

**KPI 4.2 SLA-Ready Marketplace:** This KPI measures the popularity of the SLA-related practical guides, tools and services integrated.

**KPI 4.3 Social Media:** This KPI measures social media activities such as the number of tweets, posted, the number of re-tweets, and likes. It will use twitter analytics to identify top tweets (tweets a lot of people are interacting with and sharing via re-tweets and replies); top mentions (the number of times a handle is used); impressions (the number of times users saw the tweet) and top media tweets (tweets with a video or picture).

For LinkedIn, we measure the number of members and the ratio of business representatives compared to other organisation types (e.g. public sector/government) where the aim is to have 80-90% from the business community. We also profile members in terms of the demand and supply sides. We also measure the number of blog views and slide share views to gauge the effectiveness of this activity.

**KPI 4.5 Tutorials-as-a-service (webinars):** This KPI measures the number of webinars produced by SLA-Ready, the number of relevant webinars hosted on the hub or marketplace, and the numbers of participants.

**KPI 4.6 Visibility at events and overall external visibility:** This KPI measures the number of events where SLA-Ready plays an active role, including the cloud clinics (with details thereof), the audiences present (e.g. start-ups/small businesses, large companies, CSPs), sectors represented and new contacts made. It also considers supporters of SLA-Ready (e.g. helping the validation of the common reference model) and opponents (e.g. potential barriers to the uptake of outputs and the common reference model, and fence sitters, indicating the levels (low, medium, high). Finally, this KPI also measures visibility in media and business channels, as well as on conference websites.

**KPI 4.7 External visibility:** This KPI measures the visibility of SLA-Ready on external sites, including media channels, conference websites and business channels.

**SLA-Ready Community:** By the SLA-Ready community, we mean 1) the size and structure of twitter followers, 2) profiles of the professional members of LinkedIn, and 3) the wider partner network of business contacts collected in a single database, which is used for promoting major announcements, especially the launch of new tools and services.

## *6 Partner Exploitation Plans for the SLA Marketplace*

At the time of writing the SLA-Ready proposal, the consortium identified like-minded websites for the integration of the marketplace. In this section, we define the integration process within the CloudWatchHUB and usage of the “SLA-Readiness index” within CSA STAR, highlighting the added value. In this section we provide updated partner plans, with the Cloud Security Alliance being the main stakeholder.

### **6.1 Cloud Security Alliance**

#### ***Unique expertise and innovation for SLA-Ready***

The Cloud Security Alliance is contributing with its expertise and background on Cloud governance, risks, and compliance (GRC) including Cloud security SLAs. More specifically, the Cloud Security Alliance is an active contributor to related standardisation initiatives (ISO/IEC, NIST, ETSI) and best practices (C-SIG SLA). Also the Cloud Security Alliance maintains three internal working groups on topics related to SLA-Ready namely Cloud Trust, Cloud Trust Protocol and SLA. The Cloud Security Alliance contributes also background related to the STAR Repository, which contains self-assessments from CSPs related to their security capabilities.

#### ***Contribution to SLA-Ready assets and outputs***

Three main expected outcomes from SLA-Ready are relevant for CSA:

1. The SLA-Readiness index (and its integration to STAR), will allow CSA to provide more transparency to Cloud Customers already using the STAR repository for this purpose. Furthermore, in the future the underlying SLA Repository's data could be exploited by the STARWatch tool (the foreseen "Premium" version will integrate comparison functionalities that may use the SLA Repository as input).
2. The work being carried on by WP3 is being exploited by CSA to position our organisation in the standardisation landscape related to Cloud SLAs. Some preliminary results are being already obtained e.g., NIST invitation to new initiative on machine-readable SLAs/control frameworks, and references to CSA work in ETSI CSC Phase II report and EC SMART (SLA Model) report.
3. The best practices and guidelines associated to the CRM, will be also contributed to CSA's community as part of related working groups like SLA, Cloud Trust and Cloud Trust Protocol.

#### Assets and Outputs

- **Common Reference Model (WP2):** CSA is contributing to develop and validate the proposed CRM elements through the elicitation of real-world use cases (derived from CSA's background).
- **Engagement with standardisation bodies and related initiatives (WP3):** through its International Standardisation Council, CSA has become an active contributor to ISO/IEC on the topic of Cloud SLAs (19086 Parts 1-4). Besides, CSA is also monitoring the standardization/best practices landscape to identify other initiatives like ETSI CSC Phase II. Finally, CSA is also engaged with NIST in initiatives related to Cloud SLA metrics and machine-readable formats (to be launched Q1/2016).
- **Advisory Board (WP3):** CSA analyses the feedback received from the AB mainly to refine the WP3 approach to standardization (e.g., the suggested liaison with ISO/IEC SC38).
- **SLA Repository (WP4):** CSA is driving the creation of the SLA Repository both by proposing the SLA assessment criteria, and interacting with the CSP's that will validate the analysed SLAs (Q1/2016).
- **Marketplace (WP4):** in collaboration with Trust-IT, CSA is one of the main contributors to the overall design of the Marketplace. CSA is also contributing to the content related to standards and best practices.

- **SLA-Readiness index (WP4):** Along with TUDA and Arthur, partner CSA is designing the SLA-Readiness index so it can be validated into the context of the STAR repository.

## Cloud Security Alliance

### Sustainability plans

#### On the dissemination side

Aligned to the exploitation plans presented in SLA-Ready's Description of Action (DoA), partner CSA has started five concrete actions to leverage the project's expected outcomes. These actions are summarised below.

CSA Open Certification Framework: Several and well-established security certification schemes exist to assess the level of security assurance in ICT systems. ISO27001, SSAE 16, ISAE 3402, SOC1-2-3, PCI-DSS are perhaps the most well known. Although at the state of practice some of these are applied to cloud computing, it is widely acknowledged that none of them is sufficient to assess the security of cloud systems during their operational stage. A commonly used security assurance best practice from industry is the CSA CCM, which contains a comprehensive set of controls to assess the information security assurance level of CSPs. The CSA CCM is the technical standard used in the context of the CSA Cloud certification program, called Open Certification Framework (OCF) - STAR Program<sup>20</sup>. Currently the OCF-STAR Program is the most widely used and accepted cloud-relevant certification and attestation scheme, recently also used as a reference in an EC DG-DIGIT tender to procure cloud service for EU Institution (including the EU Parliament).

CSA is in the process of evaluating enhancing the information provided by OCF-STAR by leveraging two main elements from SLA-Ready namely (i) the SLA-Readiness index, and (ii) the SLA-Ready repository. Firstly, CSA will evaluate improving OCF-STAR Level 1 (self-assessment) and in particular the STAR registry<sup>21</sup> by adding qualitative information related to the compliance of CSP's SLAs to the designed Common Reference Model (CRM). Secondly, the data contained into the SLA-Ready repository (WP2/WP4) may be used to implement the envisioned "continuous audit" feature of the OCF-STAR Level 3. This continuous audit functionality will offer a structured approach for Cloud customers to query Cloud SLA-related information from the repository, most likely using a protocol like CSA CTP<sup>22</sup>. On a second implementation stage, CSA is also evaluating to leverage a comparison functionality based on the continuous audit information possibly based

<sup>20</sup> <https://cloudsecurityalliance.org/star/>.

<sup>21</sup> [https://cloudsecurityalliance.org/star/#\\_registry](https://cloudsecurityalliance.org/star/#_registry).

<sup>22</sup> <https://cloudsecurityalliance.org/group/cloudtrust-protocol/>.



on the experience obtained from SLA-Ready.

Internal research groups: CSA maintains working groups across 29 domains of Cloud security<sup>23</sup>, a set of which are directly related to the core topic of SLA-Ready. In particular we refer to the PLA WG, SLA WG, Cloud Trust WG, and Cloud Trust Protocol WG. As presented in Deliverable 4.2, CSA has started concrete actions to (i) support those WGs with the outcomes from SLA-Ready, and (ii) contribute to the WP2 CRM based on the best practices developed within those WGs. During Year 1 the most notable contribution from SLA-Ready was to the Cloud Trust WG<sup>24</sup>, where a catalogue of security and privacy SLA metrics was developed. Cross-fertilisation of these WGs is a continuous activity that CSA develops during the duration of the SLA-Ready project.

Another CSA initiative that has been benefited from the SLA-Ready outcomes is the International Standardization Council (CSA ISC<sup>25</sup>), which is positioning CSA in the field of Cloud SLA standardization within organizations like ISO/IEC and NIST.

#### On the economic side

CSA's best practices are available and free both to volunteers and corporate members. With respect to certification (OCF-STAR) the objective of CSA's 3-year business plan (2017) is to achieve 400 certified CSPs in OCF – STAR (currently 140), from which it is expected to have at least 20% of them relying on Level 3 – continuous audit. Despite access to the STAR repository is free of cost, CSA is evaluating the economic/market value of advanced and automated features like CSP/SLA comparisons. Such functionalities may become part of the upcoming STAR Watch tool<sup>26</sup>.

#### Original plan (in Description of Action)

*Directly leverage SLA-Ready's social market place for SLAs to offer a publicly available service to compare side-by-side two or more CSPs based on the STAR entries (SLAs) and a service to continuously monitor the fulfilment of published STAR entries. CSA will customise STAR reports (Security, Trust and Assurance Registry) based on relevant outcomes of SLA-Ready, specifically CCM and CAIQ (reflecting a model closer to a cloud SLA). The repository (WP2) will be directly leveraged through STAR. It will also ensure access to CSA's network of volunteers willing to provide further insights and practical experiences about SLAs.*

Table 6. CSA Sustainability and Exploitation Plan

## 6.2 Trust-IT

### ***Unique expertise and innovation for SLA-Ready***

<sup>23</sup> <https://cloudsecurityalliance.org/research/>.

<sup>24</sup> <https://cloudsecurityalliance.org/group/cloudtrust/>.

<sup>25</sup> <https://cloudsecurityalliance.org/isc/>.

<sup>26</sup> [https://cloudsecurityalliance.org/star/#\\_watch](https://cloudsecurityalliance.org/star/#_watch).

Trust-IT is a IT-savvy **UK SME** focused on end-to-end service delivery, cloud hosting services, IT analysis and communication strategies. Its current portfolio of Horizon 2020 projects range from cloud computing (CloudWatch2, CLARUS, PICSE, and internationally the EUBrasilCloudFORUM and EU-Bra BIGSEA), to cyber security (WISER), Green IT (ICT Footprint.eu) and 5G (5G-ENSURE). It is therefore well-placed to offer insights in the evolving IT and standardisation landscape. Trust-IT also organises the annual Cloudscape workshop series in Brussels, offering a forum to showcase SLA-Ready outputs to policy makers and industry players, and what it means in terms of innovation for the Digital Single Market.

### ***Contribution to SLA-Ready assets and outputs***

Trust-IT is particularly interested in ensuring the practical implementation of the Common Reference Model (WP2); Advisory Board insights (WP3), and the SLA Repository; Marketplace; SLA-Readiness (WP4). The outcomes of standardisation activities are also of interest for integration into the CloudWatchHUB. The integration of such tools and services will enhance the CloudWatchHUB offer and make it more appealing to a wider audience, thus boosting its sustainability business model.

### ***Assets and outputs***

- **Practical implementation of the Common Reference Model (WP2):** Trust-IT has provided the sociological framework and analysis in relation to the state of the art. It has also extensively researched barriers to cloud service adoption by the business community. This is an important basis for creating tailor-made content and software tools for the SLA-Ready Marketplace.
- **Marketplace (WP4):** As one of the co-designers and co-content creators, Trust-IT has an obvious stake in sustaining the marketplace through integration in the CloudWatchHUB.

## **6.3 TU Darmstadt**

As a university, TU Darmstadt's academic exploitation falls into the two main categories of external and internal exploitation. The external exploitation primarily addresses community building in the form of publications, hosting and/or participating in thematic workshops, and organising seminars for advocacy of the technical areas of SLA based trust metrics.

The internal dissemination comes from the educational component of (a) developing courses in the areas of Cloud trustworthiness, and (b) developing students researching these areas.



For the external exploitation, TUD's DEEDS group has initiated activities such as (a) research results in publications (e.g., Cloud Security Metrics related Trans. Cloud Computing, and joint publication on SLA Standards with NIST in IEEE Cloud Computing), (b) co-chairing the Workshop on "Quantitative Aspects of Security Assurance (QASA 2015)" ([www.iit.cnr.it/qasa2015](http://www.iit.cnr.it/qasa2015)) that directly supports exploitation related to trust metrics, and (c) keynotes/seminars (e.g., NIST (SLA Based Cloud Security Metrics); Distinguished Seminars at: Duke University, University of North Carolina, NCSU (Security for Cloud Storage); Academia Sinica, Taiwan; SMU (Cloud Trustworthiness); Univ of British Columbia (Cloud Storage)). Similarly, TUD conducted both academic and industrial seminars using three technology transfer mechanisms available at TUD, namely (a) the university-industry technology transfer CAST Forum for industry seminars e.g., Seminar on the 'Economics of Quantifying Cloud Trustworthiness', (b) the TUD-CASED (Center for Advanced Security in Darmstadt) industry outreach programs, and (c) TUD EC- SPRIDE (European Competence Center in Security & Privacy by Design) which has evolved into advocacy via the new TU Darmstadt Cyber Security Center CRISP.

TU Darmstadt's DEEDS group broader advocacy (and engagement) of the SLA based trust metrics area is ongoing with existing EC projects (e.g. FP7 SPECS, H2020 ESCUDO-CLOUD, A4Cloud), via engagement with focused working groups such as EC's C-SIG-SLA WG, and also with standards bodies such as ENISA/NIST/CSA (e.g. CSA EMEA Workshop on Governance Accountability Compliance <https://csacongress.org/event/emea-2015/#worksops>). TU Darmstadt has also successfully engaged with NIST for SLA standards that resulted in a joint TUD/CSA/NIST publication entitled "Leveraging the Potential of Cloud Security Service Level Agreements through Standards" in IEEE Cloud Computing. A related research agenda influencing activity was a panel discussion on Trust Metrics at BMBF (German Federal Ministry for Science and Technology). TU Darmstadt is also utilizing its membership in the European Computer Science Summit (ECSS) to advocate SLA reference models. The DEEDS plan to pursue the advocacy of the Cyber trust quantification area via dedicated EC fora such as Marie Curie ITN's has been successful with the acceptance of H2020 ITN-MC-NECS.

For the internal exploitation, the DEEDS group has initiated BS/MS course/seminar offerings in the area of Cloud Trustworthiness. This is also a technical growth area for the university, and our approach is to expose the students to the multiple research and educational offerings to grow their research/technical competencies for both research and applications. As a first step we have offered a MS level seminar on "Security and the Cloud—the Issues and Metrics" and will develop SLA relevant content in this and additional seminar/course offerings. Related to the later, the DEEDS group will leverage the data contained into the SLA-Repository and the SLA-Readiness Index to provide

empirical validation of the developed SLA metrics models and techniques. The specific topics related to trust metrics will also be advertised for MS and PhD theses.

## 6.4 Arthur's Legal

Arthur's Legal B.V. ([www.arthurslegal.com](http://www.arthurslegal.com)) is an independent law firm, founded in 2001 and working on a global, cross-border level. Its headquarters is in Amsterdam, with partnerships in, for instance Barcelona, and other cities, and numerous informal collaborations in every member state of the European Union, and almost every country in the world.

It represents and has represented more than 100 IT, ISP, data centre, software and CSP vendors in all phases of their legal life cycle, including incorporation, strategic structuring, 3D data governance, system integration, hardware, software, XaaS, IoT, Robotica and other high tech and IT services, development, change management, ERP projects, public and private tenders, OEM projects, joint ventures, deal making, negotiations, as well as – where necessary – escalations, arbitration and litigation.

On these topics Arthur's Legal also represented and represents European and other companies and non-profit organisations purchasing/buying and implementing IT, ISP and CSP. Arthur's Legal knows and understands the concerns and interests from both sides.

Besides the above, we coach and assist almost 100 European techno starters (cloud computing, eHealth, medical devices, cleantech, sustainable energy and other (high) tech, mostly linked to or spun-out of technical universities), substantially on a pro bono basis, in order to get them started up and ready to grow and succeed.

Whoever Arthur's Legal helps out, it will be hands-on and practical, and it will always try to find out how the real life technology, information flows and business models work before advising and assisting in structuring and ironing out a well-balanced deal with is interesting and beneficial for all involved.

Arthur's Legal will directly leverage SLA-Ready outputs to offer specialised services to its clients. SLA-Ready will therefore enable Arthur's Legal to extend its portfolio of client services and become more flexible and relevant to SMEs and micro companies as a growing market segment. Specifically, it will exploit the reports documenting the best practices for managing cloud SLA: systematic and multi-level comparison, metrics for validation; techniques for the negotiation and trade-off evaluation; enforcement of SLA conditions; contract termination procedure; guidance on (cost-aware) monitoring of cloud SLA execution.

## 7 Conclusions

SLA-Ready will use the current SLA-Ready analyses, particularly D2.2 for a phased rollout of the SLA marketplace as the practical implementation of its Common Reference Model (May and December 2016) and related state of the art analysis<sup>27</sup>. The roadmap for the SLA marketplace is a dual phase rollout of the tools and services as the Common Reference Model matures, while also drawing on the outcomes of its validation process.

The hub and marketplace are central to educating and empowering CSCs from the private sector and small public administrations by offering a suite of services, tools, practical guides and tutorials (web-based and hands-on), which combine SLA-Ready outputs with guides and tools produced elsewhere, including other European projects.

The cloud business hub offers prospective cloud customers a step-by-step guide to cloud services, helping them understand what to expect. The marketplace will provide a stepwise guide to cloud contracts and SLAs, including the entire SLA lifecycle.

SLA-Ready is well placed to empower small businesses by offering vital insights into how to deal with all aspects related to the SLA and SLOs, the contractual clauses, and coverage (or lack of it) on security, privacy, data management and data protection.

We will ensure continued usage of the SLA-Ready and related external tools and services, SLA-Ready will facilitate their deployment on the CSA STAR<sup>28</sup>, and integration into the CloudWatchHUB<sup>29</sup>. The sustainability of the marketplace is assured through concrete partner plans for exploitation and sustainability, as well as initial plans to exploit the most relevant outputs for their institutional and corporate missions. **D4.5 - Socio-economic Impact of SLA-Ready** will provide the final set of exploitation plans (December 2016).

Forthcoming foundational outputs for the SLA-Ready marketplace are:

- State-of-the-art analysis and current alignment with the European Commission Guidelines representing best practices (**June and December 2015**)<sup>30</sup>.
- Common Reference Model to benefit the industry by integrating a set of SLA components, such as common vocabularies, SLO service metrics and measurements (**May and December 2016**).

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<sup>27</sup> D2.1 State-of-the-art analysis, June 2015 and D2.2 State-of-the-art analysis – final report, December 2015.

<sup>28</sup> [https://cloudsecurityalliance.org/star/#\\_registry](https://cloudsecurityalliance.org/star/#_registry).

<sup>29</sup> <http://www.cloudwatchhub.eu/>.

<sup>30</sup> The Guidelines were published in June 2014 and included contributions from the SLA-Ready Consortium. For more information on the current phase, see <http://ec.europa.eu/digital-agenda/en/news/cloud-select-industry-group-c-sig-plenary-meeting-0>.



- International Co-operation and Standardisation to identify best practices and identify gaps in the current SLA landscape. (**February and December 2015**).
- Business Guide to SLAs - how to be a well-advised user of Cloud Services (**December 2016**).

## *8 Annex 2 Year 1 review recommendation response: Joint Exploitation and Sustainability Plan*

The project partners will address targeted joint exploitation plans that will feed through the entry point to the revised SLA-READY marketplace hub (see the draft version of the landing page in fig 1). The project assets identified for joint exploitation, as well as individual exploitation, are identified in Table 1.

**Trust-IT** will create a personalised cloud lifecycle service report for SMEs from the results of the Common Reference Model with the support of an a-synchronised helpdesk for any questions related to the report to help SMEs. This is found via the “Tools & Guides to the Cloud”. Trust-IT will use its international network to disseminate the online personalised cloud service lifecycle report for SMEs.

Trust-IT will maintain the SLA-READY marketplace for one year plus an additional year of hosting and maintenance with ad hoc content introduced when relevant updates are necessary to replace previous content.

**CSA** will maintain (after the finalisation of the project) the SLA Readiness Index, and also support the continuous maintenance, of published SLA Repository entries by enforcing the “Term & Conditions” for CSPs as currently featured under the “CSA Star Registry<sup>31</sup>”. CSA will also disseminate the online Cloud SLA Advisor as described in Section 3 of this report.

**Arthur’s Legal** would be able to have its clients access to its privileged and specialised legal services for contract support. This is addressed under the SLA-READY Services entitled: “Legal Services”. It will also disseminate the online-personalised cloud service lifecycle report for SMEs.

**TUDA**, through the knowledge created via the SLA-READY marketplace hub, will contain advanced information on accessing educational services and academic/industry seminars. The courses would be focused around advanced security, new-IT security master curricula tailored to industry competence. This information is provided under the SLA-READY Services “Master Courses”.

With an asynchronous helpdesk, each partner, for a period of up to twenty-four (24) months after the project completion, can reply to the pertinent questions related to the four levels of services that are provided. The questions will be related to one of the four SLA-READY services that we have indicated 1) CSA STAR Registry and its SLA-Readiness

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<sup>31</sup> Please refer to [https://cloudsecurityalliance.org/star/self-assessment/#\\_terms](https://cloudsecurityalliance.org/star/self-assessment/#_terms)

Index (CSA); 2) Tools & guides to the Cloud (Trust-IT) ; 3) Legal Services (Arthur's Legal) ; 4) Master Courses (TUDA).

There will be an exhaustive FAQ which will cover approximately 80% of the normal requests that are normally asked by CSPs or CSCs. We envisage the remaining 20% will go through the HelpDesk. For the time indicated, Trust-IT can build on the FAQ with the answers provided in the Help-desk.

Figure 1 shows the landing page and service entry level for CSCs and CSPs on the new SLA-Ready.eu homepage to be launched in M19. The homepage includes the following entry points

- CSC entrance point leading to best practices questionnaire
- CSP entrance point leading to SLA-Readiness index
- SLA-Ready services leading to an a-synchronised helpdesk with special services which are a central part of the Joint Exploitation Plan with the commitment of each partner to keep them updated.

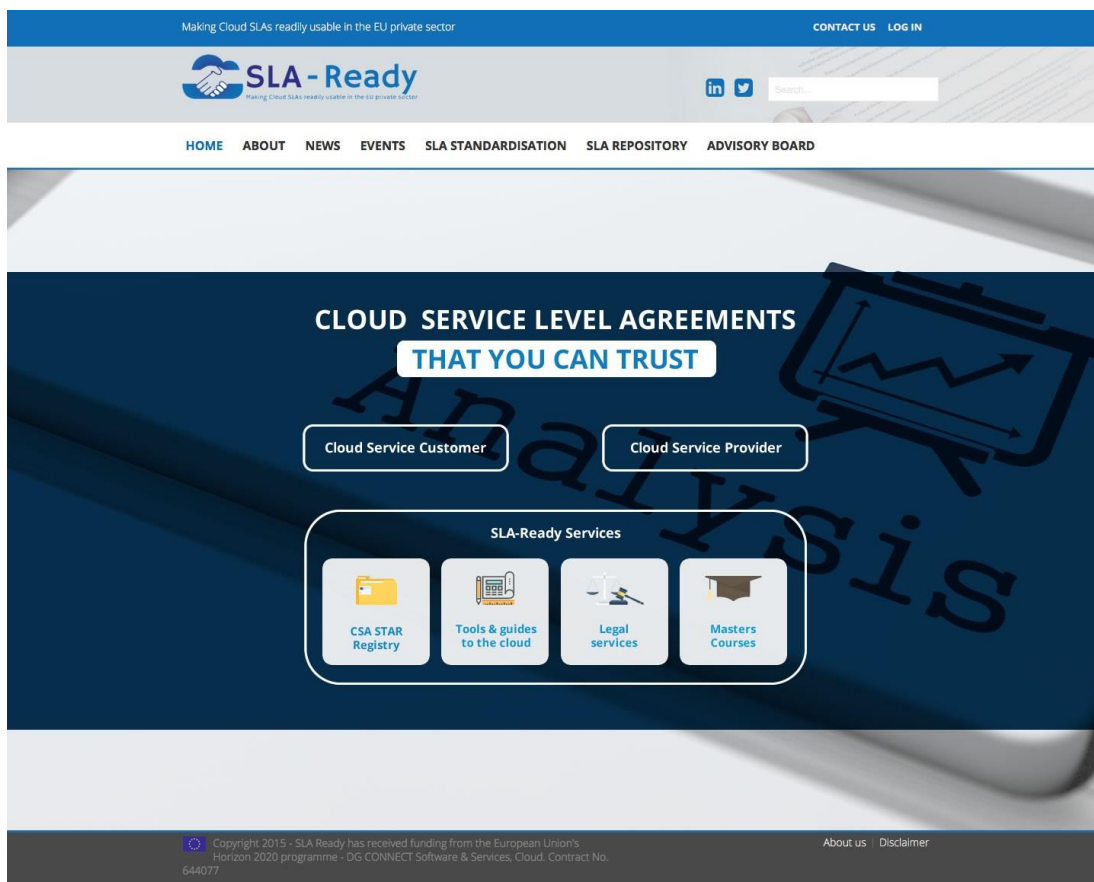


Figure 5. SLA-Ready.eu homepage mock-up

The table below shows how partner expertise and future activities come together to compliment and reinforce the joint exploitation and sustainability plan

Partner	Joint Exploitation plan for online personalised cloud service	H2020 Project - Individual partner complementary exploitation plans
<b>Trust-IT</b>	Market Targets: SMEs and clients	Maintenance of the service for 1 + 1 year. Integration into the CloudWATCHHub to enhance current offer of tools and services for SME.
<b>CSA</b>	Market Targets: private sector organizations, CSPs and government	Best practice promotion at EU and international levels, e.g. Cloudscape Brazil (via EUBrasilCloudForum), EUBraBIGSEA, CLARUS, 5G-ENSURE. As a cloud reseller, support commercial clients through their use of the online service.
<b>Arthur's Legal</b>	Market Targets: SMEs, start-ups including new service providers	Expand CSA STAR repository with additional SLA-related information from participant CSPs in particular. The SLA Readiness index: On a voluntary basis, registered CSPs can increase cloud transparency and SLA comparability through this publicly available information.
<b>TUDA</b>	Market Target: public education institutions	Access to specialised legal services and contract support, leveraging the best practices for managing cloud SLA.
		Extend legal service portfolio to SMEs and accelerators e.g. FinTech Holland. Value-add services include: techniques for negotiation and trade-off evaluation; enforcement of SLA conditions; contract termination procedure.
		Centre for advanced security: introduce new IT-security curricula at institutional and EU levels in collaboration with industry.

Table 7. SLA-Ready joint exploitation plan



## 8.1 Strategy for engaging SMEs

→ Practical implementation of WP2 outputs (D2.3 Common Reference Model, drawing also on the state-of-the-art analysis), WP3 (D3.2 Standardisation and international cooperation, and D3.3 A Business Guide to Service Level Agreements) with WP4 tailoring content to specific stakeholders targeted: SMEs, large companies, CSPs.

### 8.1.1 SLA-Ready Marketplace: beyond an aggregation of SLAs

#### 8.1.1.1 SME CSC-centric tools

**Cloud SLA advisor:** guiding SME CSCs, or prospective CSCs, through the entire cloud SLA life-cycle. An automated questionnaire helps CSCs match their cloud business use case for the service or services of choice, helping them understand related SLAs, and responsibilities and actions they need to take as a CSC. The tool will leverage SLA-Ready's CRM to help clarify the complex SLA terms and terminology and guide the SMEs in evaluating the expected service provision: from performance to security and privacy levels.

Large companies can benefit from the developed SLA guidance as common concerns emerging from the SLA-Ready analysis of use cases, its mapping to the CRM, and f2f interactions.





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### Cloud Service Customer

#### 3 Steps to get your personalised SLA Advisor Report

##### 1. Tell us about you

5 Minutes

User details

Business requirements

Company size

Technical expertise

##### 2. Your position in cloud service lifecycle & cloud services required

5 Minutes

Your position in lifecycle

Type of cloud services required


##### 3. Tell us what you want from your contract

10 Minutes

Security requirements

Reporting requirements

Performance requirements

 Download your personalised SLA Advisor report

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Figure 6. Example of potential three-step for SME to get personalised SLA Advisor

**The SLA-Ready Business Hub:** creating an online resource of online content (documents, reports, articles, videos etc) that can help raise awareness of SLAs and lower the entry barrier for cloud service customers, from small or large companies.

#### Guides and Services:

- A business guide to SLAs (D3.3 and tailored content from desk research and interviews).

- User experiences and socio-economic insights on use cases with particular reference to D2.3: small financial institutions/services; SMEs and small public administrations/agencies.
- Tips focused on the legal aspects in the cloud service life cycle (D3.3., legal studies, EC sources on DPRR and Privacy Shield).
- Tips focused on security and privacy aspects in the cloud service life cycle (D3.3, ENISA, CSA and cloud security event summaries).
- Brief Insights: short documents for busy professionals, summarising longer reports so readers become swiftly acquainted with a larger body of knowledge.
- Glossary of SLA terms based on the common terminology in the Common Reference Model.

#### 8.1.1.2 CSP-centric tool

**The SLA Readiness index** is designed as a quantitative metric for CSPs to assess the fulfilment of the SLA-Ready's CRM as a best practice to guide (prospective) customers on the management of the cloud SLA lifecycle. The major aim is for the Index to become an incentive for CSP's transparency and comparability of offered SLAs. Figure 3 shows a potential procedure for a CSP using the service.

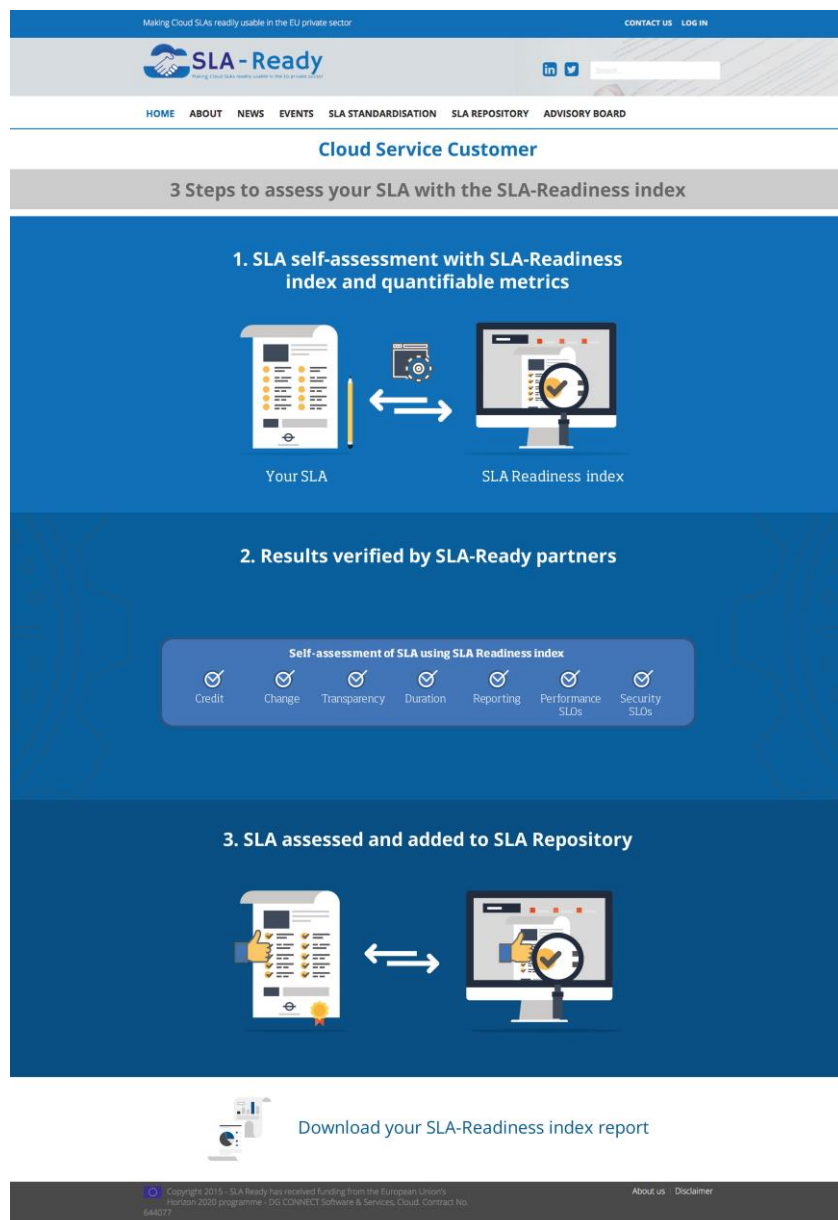


Figure 7. Example of potential SLA-Readiness Index process

The SLA Repository within the SLA-Ready marketplace provides SLA information analysed through CSP self-assessments based on the Common Reference Model proposed by D2.3 and D2.4. In order to facilitate the usability of these analyses, especially for SMEs that are not IT-savvy, an integrated SLA Readiness Index will be computed for each CSP entry in the SLA Repository as discussed in D2.2 and D4.2. Then, the index will be used as an entry point for customers willing to know (in a nutshell) the CSP SLA alignment to the most common SME needs documented by the CRM. The SLA Readiness Index is more than an

“interpretation” of the CSP SLA, it is an actual aggregation of different quality metrics defined for representative elements of the SLA as documented by the CRM.

The SLA Repository will be further improved after the duration of the project, in particular with mechanisms to exploit the contained CSP SLA information to allow CSP comparisons and continuous monitoring. Tools and techniques to implement both comparison and monitoring of SLAs have been researched and prototyped in previous EU funded projects like FP7 SPECS<sup>32</sup>, where both CSA and TUDA participated.

The objective after the finalisation of SLA-Ready is then to provide online services available to (prospective) CSCs to help them be guided through the SLA life-cycle based on their own specific needs and help them to understand cloud SLAs. The marketplace will provide the opportunity for SMEs to match their use cases (including business and technical aspects of the service). The proposed services will also need to identify the most relevant cloud SLA metrics, addressing performance, security, privacy and legal aspects in an SLA. This will help clarify the complex SLA terms and terminology and propose a structured way to guide the SMEs in evaluating the expected cloud service provision and SLA management.

Furthermore, by providing the SLA-Readiness index and assessment of SLAs to CSPs, SLA-Ready encourages a culture of transparency amongst CSPs and fosters greater trust of SLAs in CSCs.

## 8.2 Stakeholder Engagement Strategy

From year one findings (D2.1 and D2.2.), it emerges that:

- Significant gaps still exist between current CSP SLA practices and the recommendations of the C-SIG SLAs (European Standardisation Guidelines for SLAs).
- SMEs still face considerable technical and non-technical barriers in adopting cloud services and in understanding legal and security implications, often due to the lack of adequate SLA coverage. The difference between CSP and CSC bargaining power is also causing an asymmetrical cloud market<sup>33</sup>.

Facilitating awareness and understanding of cloud SLAs therefore remains an important factor determining the adoption of cloud services coupled with the

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<sup>32</sup> <http://www.specs-project.eu/>.

<sup>33</sup> CloudWATCH2 Roadmap to a Cloud Market Structure Encouraging Pricing Transparency – First Iteration.

promotion of greater transparency and trust of CSPs on the part of CSCs (SMEs, large companies).

<b>Value proposition for SMEs</b>
<p>SLA-Ready provides a central entry point (hub and marketplace) for practical guides and insider tips to fill knowledge gaps key for effective service life cycle management. It avoids users having to look for information dispersed across many different websites and documents.</p> <p>Being “SLA-Ready”: Unleashing economic benefits for increasing number of SMEs becoming digital businesses; supporting FinTech firms in adopting security and privacy best practices.</p>
<b>Value proposition for large companies</b>
<p>Large companies can be in a position to negotiate contractual terms and add SLA metrics but may lack specialised cloud security and privacy expertise.</p> <p>Being “SLA-Ready”: greater awareness of security benefits and risks (e.g. shift from legacy systems), guidance on understanding and negotiation SLA terms and conditions in terms of risk assessment and management.</p> <p>This group can also become champions, encouraging CSP transparency and best practice adoption so SLA metrics no longer remain the preserve of the few.</p>
<b>Value proposition for CSPs</b>
<p>Greater attention to prospective CSC concerns and requirements is an opportunity for CSPs to broaden their market reach.</p> <p>Being “SLA-Ready”: reducing the significant gaps between current practices and C-SIG SLA/ETSI recommended best practices. Facilitate CSPs in implementing standardised terms, metrics and common vocabularies in SLAs, as well as adoption of relevant standards.</p>

Table 8. SLA-Ready Value proposition

### 8.2.1 Events

Y2 will see an intensification of participation at events around the results of SLA-Ready (services/tools, insights and best practices) in order to validate and promote project results. SLA-Ready has sufficient budget for travel and advancing from the AB expenses to allow for such intensified engagement, including travel and accommodation costs for invited SMEs.

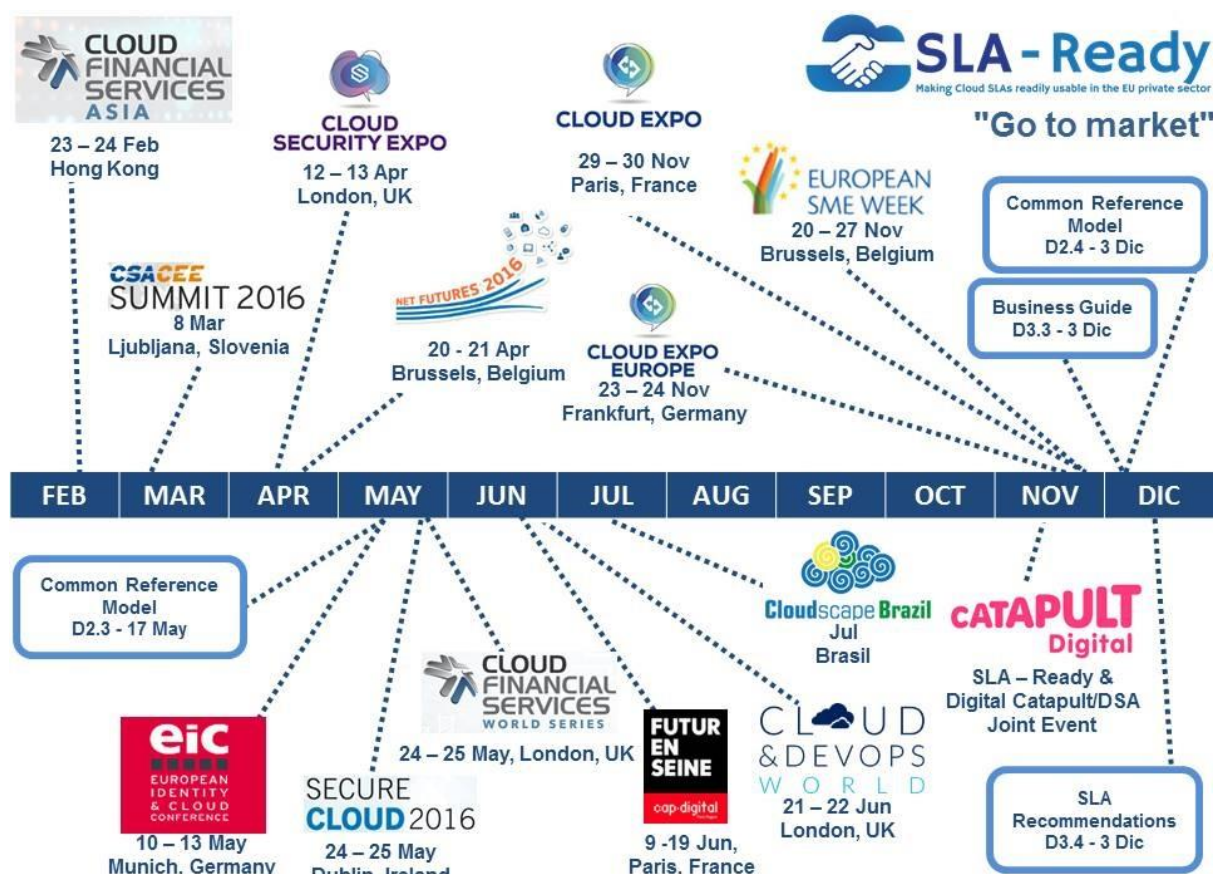


Figure 8. Events for the SLA-Ready Go to Market

### 8.2.1.1 Information stands

SLA-Ready will participate at a number of cloud consumer events with a café style information stand promoting the SLA-Ready marketplace and business hub. The objective of the stand will be to engage face-to-face with CSCs in order to assess needs and requirements and promote the use the marketplace and hub. Such events will also provide an opportunity to gauge user feedback on user-experience of the CSC-centric and CSP-centric services SLA-Ready offers.

Such events will also provide the opportunity to engage directly with CSPs with the objective of encouraging them to complete the SLA-Readiness index and submit their improved SLA into the repository.

**KPI 4: 4 Info stands / Coffee corners to engage stakeholders ~ 100 contacts**

**KPI 5: 4 presentations at events**



#### 8.2.1.2 Tutorials

SLA-Ready produces and promotes webinars and hands-on tutorials based on the specific requirements identified. This service will offer important insights and tutorials on legal and data protection issues; technical aspects; showcases of real-world implementation use cases; real efforts on reference model implementations.

#### **KPI 3: 3 Tutorials (Y2)**

#### 8.2.2 Participation in the community/open discussion forums

SLA-Ready engagement with NCPs and business associations has a twofold objective:

- Communicate personalised, targeted messages inviting their members to try out the lifecycle tool and become a “champion user”.
- Co-host or co-locate events inviting SME members and other companies within easy reach of the venue throughout Y2.

Sample of associations targeted covering much of EU28:

- EU-wide: the European Digital SME Alliance and UEAPME; the European Business and Innovation Network; EIT Digital.
- Northern Europe: InnovateUK (UK), Digital Catapult (UK), techUK (UK), Tech Clusters Finland.
- Central Europe: Agoria (BE), BetaGroup (BE), Ametic (ES), BITmi (DE), ASSINTEL (IT),
- Eastern Europe: SMART ALLIANCE (RO), IVSZ (HU).

**SLA-Ready LinkedIn** is a business community, comprising SMEs and start-ups, large companies and CSPs to leverage as part of the outreach strategy, and is already in Y1 a tried and tested discussion forum.

#### **KPI 6: ~ 300 social media followers**

#### **KPI 7: 4 LinkedIn discussions created**

#### 8.2.3 Translating SLA-Ready outputs

SLA-Ready will engage with SME organisations listed in section 5.2 in order to promote CSC-centric services to their members. SLA-Ready will also gauge their interest in providing translated versions of services. In particular, the consortium will target National Trade Associations who already committed to translated other online Cloud-SME services such as the European CloudScout (Finnish, French, German, Hungarian, Dutch).