



## **Cloud-TM**

Specific Targeted Research Project (STReP)

Contract no. 257784

### **D5.3: Initial Collaboration Plan**

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# 1 Introduction

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This document illustrates the initial plan for collaborations with other FP7 projects under the Work Programme 2009/2010 Objective “Internet of Services, Software and Virtualization”.

The collaboration activities described hereafter are largely based on the opportunities identified during the participation to the Collaboration Meeting held in Bruxelles on the 19<sup>th</sup> and 20<sup>th</sup> of October 2010, in which the Cloud-TM project was represented by its coordinator, Dr. Paolo Romano.

Based of the information gathered during this meeting, and at the light of an a-posteriori study of the advertised goals of the Call 1 and Call 5 projects active in areas related to the ones addressed in Cloud-TM, we have identified three main potential areas of collaboration, namely:

1. *Standardized APIs for resource provisioning from Cloud infrastructures*
2. *QoS specification, negotiation and monitoring*
3. *Storage and data management platforms for the Cloud*

In this document we first elaborate on the potential benefits achievable by pursuing collaborations in these research areas. Then we detail the set of Call 1 and Call 5 projects that we have identified as potential candidates for activating collaborations with our consortium. Finally, we report the Working Groups in which the Cloud-TM project is going to participate and the activities up to date carried out in this context.

## 1.1 Relation with other deliverables

The Periodic Management Reports, namely deliverables D6.1, D6.2, D6.3, will provide information on the advancement of the collaboration activities planned in this document, and possibly update the collaboration plan to take into account of future developments of the Cloud-TM and related EU funded projects.

## 2 Main Areas of Collaboration

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Based on the information gathered during the Bruxelles Collaboration Meeting, and on a subsequent analysis of the research results and goals of the related Call 1 and Call 5 projects, we were able to identify three main areas of collaboration with other EU funded projects, namely:

- *Standardized APIs for resource provisioning from Cloud infrastructures:* at the moment of writing there is, to the best of our knowledge, no universally recognized standards for allocating/deallocating resources (e.g. virtual machines, storage or network facilities) from IaaS Cloud platforms. This reduces portability of existing solutions for automated resource provisioning, one of the key objectives aimed at by Cloud-TM and many of the currently active EU funded projects in the area of QoS management and Cloud computing.

While defining new standards for resource provisioning is out of the scope of the Cloud-TM project, we are willing to collaborate with EU funded projects active in this area (such as Mosaic) by either providing use cases or applications leveraging such APIs (for instance, the Cloud-TM's Autonomic Manager). We believe that this will be useful both for Cloud-TM, which will benefit from a higher portability, and for other EU projects directly working in this area, which will be provided with (additional) real use cases/applications to validate the effectiveness of the proposed standards.

- *QoS specification, negotiation and monitoring:* automating the provisioning of resources from the underlying Cloud infrastructure to ensure applications' SLAs is a key goal that Cloud-TM shares with several currently active EU projects in the areas of QoS and Cloud computing. While these projects typically target different kind of applications (for instance, in Cloud-TM we target a middleware for transactional data manipulations), all of them will have to face the issue of developing tools for QoS specification, negotiation and monitoring.

Unfortunately, at current date there are no universally recognized standards in the area. This represents a significant hurdle as it forces practically each project in the area of Cloud computing to implement analogous, but proprietary, solutions that end up being incompatible and often not easily comparable.

For a small scale project like Cloud-TM, whose focus is on other research topics (such as transactional data management and self-optimization mechanisms), the availability of standardized, robust, open tools for QoS specification, negotiation and monitoring would be extremely beneficial as it would allow to concentrate the efforts on the key challenges addressed by the project. We are therefore willing to get involved in efforts aimed at cooperatively developing such tools with other projects working in this area, or at reusing

existing results developed by older projects working in this area.

- *Storage and data management platforms for the Cloud*: several call 5 projects (e.g. Contrail, Vision Cloud) focus on the issue of developing innovative storage solutions for the Cloud, addressing problems such as data security and Cloud providers federation. While these research directions are not the focus of the Cloud-TM project, an important issue that we intend to address is related to how to integrate the Cloud-TM transactional data platform with heterogeneous Cloud storage platforms. Our approach will be based on a modular, plug-in based architecture whose goal is to minimize the cost of porting the Cloud-TM middleware to persist its state on top of heterogeneous storage platforms.

We will be therefore closely monitoring the advances of EU projects in the area, making available our data platform's use cases and pilot applications. We will also evaluate the possibility of developing plug-ins to integrate the Cloud-TM data platform with innovative storage solutions developed by any of these projects providing features of particular relevance for our project.

## 2.1 Related Call 1 and Call 5 projects

In the following we report, for each of the collaboration areas identified in Section 2, the corresponding Call 1 and Call 5 projects that will be contacted in order to activate mutual collaboration efforts:

*Collaboration area: "Standardized APIs for resource provisioning from Cloud infrastructures"*

Call 5 projects:

- 4Caast
- Cloud4SOA
- Vision Cloud
- OPTIMIS
- CONTRAIL
- mOSAIC

*Collaboration area: QoS specification, negotiation and monitoring:*

Call 1 projects:

- IMPRESS
- SMARTLM
- SLA@SOI
- RESERVOIR

Call 5 projects:

- 4Caast
- Cloud4SOA
- Vision Cloud
- OPTIMIS
- CONTRAIL
- mOSAIC

*Storage and data management platforms for the Cloud:*

Call 5 projects:

- Vision Cloud
- CONTRAIL

## 3 Participation to Working Groups

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The Cloud-TM project is currently collaborating in the following three working groups:

- 1. Virtualized Service Platforms**
- 2. Quality of Service & Service Level Agreements**
- 3. Service Engineering**

At the time of preparation of this report, the Working Groups on “Virtualized Service Platforms” and “Service Engineering” are still bootstrapping their activities, and it is expected that teleconference will be organized before the end of 2010 to define a more detailed work plan.

On the 3<sup>rd</sup> of November 2010, the Cloud-TM project, represented by Dr. Paolo Romano, participated to a teleconference organized by the “Quality of Service & Service Level Agreements” Working Group. During this teleconference several collaboration points among Call 1 and Call 5 projects have been identified and are reported in the table shown in Figure 1.



QoS & SLAs Working Group															
	S-CUBE	Q-Impress	SmartLM	IRMOS	RESERVOIR	SLA@SOI	SOCIOS	Cloud4SOA	FITTEST	PLAY	SRT-15	VISION Cloud	OPTIMIS	CONTRAIL	CloudTM
S-CUBE	X	Quality Prediction							Testing					Reference Model	
Q-Impress	Quality Prediction	X							Metamodel for QoS						
SmartLM			X				WSAG4J	SLA Negotiation							
IRMOS				X							QoS Monitoring	SLA Management			QoS Specification, Negotiation, Monitoring
RESERVOIR					X						QoS Monitoring				QoS Specification, Negotiation, Monitoring
SLA@SOI						X					QoS Monitoring	SLA Management		SLA Lifecycle	QoS Specification, Negotiation, Monitoring
SOCIOS			WSAG4J				X								
Cloud4SOA			SLA Negotiation					X					SLA Lifecycle		
FITTEST	Testing	Metamodel for QoS							X						
PLAY										X					
SRT-15				QoS Monitoring	QoS Monitoring	QoS Monitoring					X			QoS Monitoring	QoS Specification, Negotiation, Monitoring
VISION Cloud				SLA Management		SLA Management						X			
OPTIMIS								SLA Lifecycle					X	Term Languages	QoS Specification, Negotiation, Monitoring
CONTRAIL	Reference Model			QoS Management		SLA Lifecycle					QoS Monitoring		Term Languages	X	QoS Specification, Negotiation, Monitoring
CloudTM				QoS Specification, Negotiation, Monitoring	QoS Specification, Negotiation, Monitoring	QoS Specification, Negotiation, Monitoring					QoS Specification, Negotiation, Monitoring		QoS Specification, Negotiation, Monitoring	QoS Specification, Negotiation, Monitoring	X
Call 1 Projects															
Call 5 Projects															

Figure 1: Foreseen collaborations within the QoS & SLAs Working Group