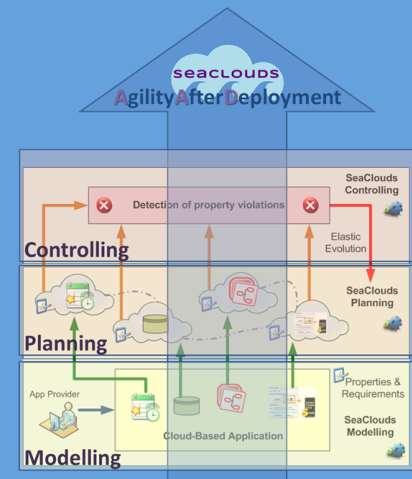


seaclouds

AGILITY AFTER DEPLOYMENT

Modelling Planning Controlling



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Editorial

Nowadays Cloud Computing reduces time-to-market and provides on-demand scalability at a low cost. Many private and public Clouds have emerged during the last years, offering a range of different technologies each suited for particular types of applications.

One of the problems arising in this heterogeneous scenario is the lack of standardization in cloud services, which pushes cloud customers to end up “locked-in” with the chosen cloud provider. In the current situation, it is possible to deploy and monitor a stand-alone application, but not a complex one, and even if frameworks for complex applications on the Cloud can be used, this requires changing the code or using modeling languages.

SeaClouds is an European FP7 research project, whose goal is to develop an open standard solution to tackle adaptive management of complex applications over multiple clouds in a flexible way.

SeaClouds works towards giving organizations the capability of “**Agility After Deployment**” for cloud-based applications, by supporting developers and application managers through the creation of an open source platform that leverages open standards (such as **OASIS CAMP** and **TOSCA**) in order to support the deployment of applications over multiple clouds, the monitoring of such deployments, and the migration of application modules across different (both public and private) cloud providers if needed.

The consortium of the project includes six European partners: three companies – Atos, Cloudsoft and Nurogames – and three universities – Malaga, Pisa and Politecnico di Milano.

The project started by October 2013 and will last until April 2016. Through our website and this periodic Newsletter we will keep you informed about our progress.

Overview

The SeaClouds project

SeaClouds aims to tackle the problem of deploying and managing, in an efficient and adaptive way, complex multi-services applications over technologically heterogeneous Clouds environments. More specifically:

- Orchestration and adaptation of services distributed over different cloud providers.
- Monitoring and run-time reconfiguration operations of services distributed over multiple heterogeneous cloud providers.
- Offering unified application management of services distributed over different cloud providers.
- Compliance with major standards for cloud interoperability.

To this end, SeaClouds will perform a seamless adaptive multi-cloud management of service-based applications, by developing Cloud Service Orchestrators and a set of tools to manage complex applications, thus avoiding the problem of Cloud lock-in.

This will be achieved by supporting the migration, replication, and distribution of modules that compose cloud-based applications over multiple and technologically diverse Clouds offerings, by using a unified management API and universal metrics for monitoring and verifying functional and non-functional properties.

SeaClouds will support the work of developers and application managers. In the design phase, SeaClouds will provide them with a new approach based on TOSCA specification to express how each component of the application should interact with the other components, and a language to specify requirements in terms of QoS for each component and for the application as a whole. In the deployment phase, SeaClouds will provide them with searching tool among existing Cloud offerings for those that best match the developer's requirements expressed at design time, and also tools to deploy the application on the selected Cloud providers. In the runtime phase, SeaClouds will provide tools to monitor and analyze the performances of each component across different providers, and also tools to assess whether and which components should be re-deployed on different Cloud providers when some violation appears. In case of redeployment, tools to redeploy the underperforming components on different Cloud providers and to adapt the orchestration to the new configuration are provided.

These tools provided by SeaClouds will be organized in a framework, which will be available either as software to install on premises or as Software as a Service, or a combination of both.

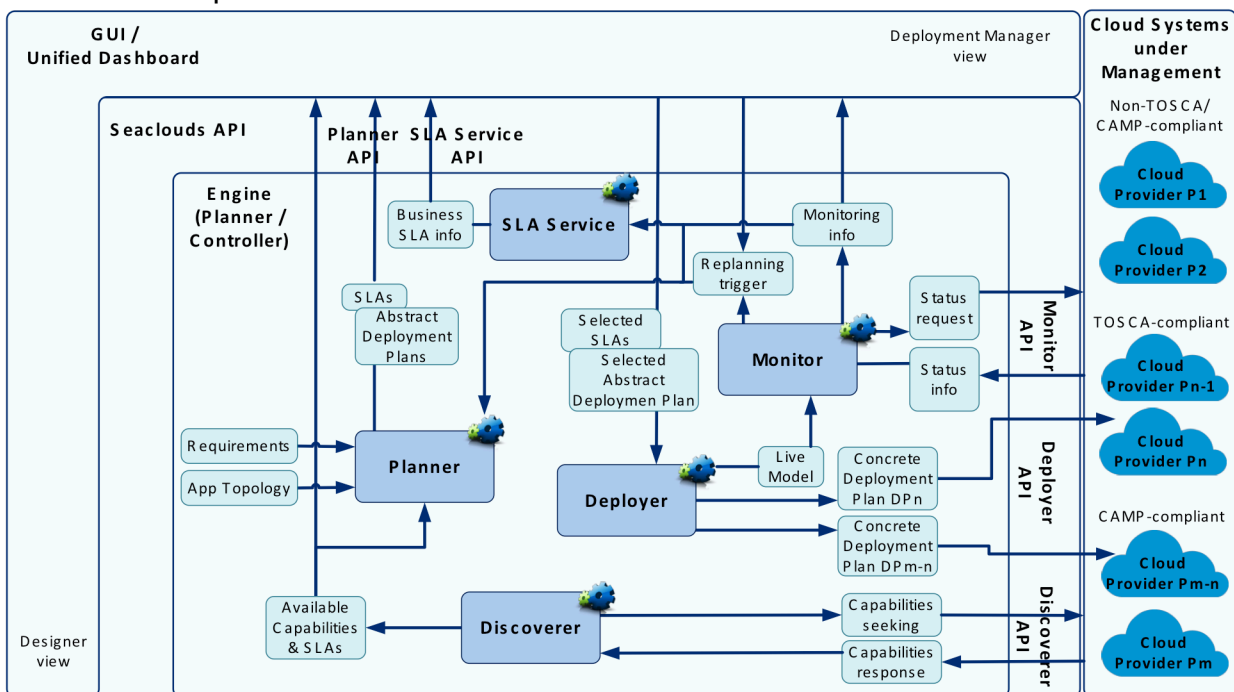
On the Spotlight

SeaClouds Reference Architecture

The SeaClouds consortium has provided the first version of its reference architecture within its deliverable D2.2 that is available on the [project website](#).

The main stakeholders for the SeaClouds platform are the following:

- **Application Designer (or Developer)** exploits the GUI to provide a description of the topology of the application to be deployed together with a set of requirements, which includes QoS properties and technology requirements for the application modules and also the whole application.
- **Deployment Manager (or Application Manager)** exploits the GUI through a Unified Dashboard to supervise the deployment and the monitoring of the application.
- **Cloud Providers** provide the Cloud resources.



As regards the SeaClouds platform functionalities, five components are identified in the architecture: **SeaClouds Discoverer** is in charge of discovering (by using the Discoverer API) available capabilities and add-ons offered by available cloud providers. **SeaClouds Planner** is in charge of implementing planning policy (by means of the Planner API) to orchestrate the multi-cloud deployment of the application modules. **SeaClouds Deployer** is in charge of taking as input the orchestration specification generated by the Planner, and deploying (by exploiting the Deployer API) the application modules on the specified clouds.

SeaClouds Monitor is in charge of monitoring (by exploiting the Monitor API) that the QoS properties of the application modules and the whole application are not violated by the clouds in which they were deployed, and in charge of generating the reconfiguration suggestions (if needed) to be passed as inputs to the Planner to trigger the generation of a new adaptive orchestration plan. **SeaClouds SLA Service** is in charge of mapping (by using the SLA Service API) the low level information gathered from the Monitor into business level information about the fulfilment of the SLA defined for a SeaClouds application.

Latest SeaClouds News

1st SeaClouds Scientific Workshop

The 1st SeaClouds scientific workshop was promoted and organized by the SeaClouds consortium, and accepted as part of the **European Conference on Service-Oriented and Cloud Computing (ESOCC)** program, held on September 2, 2014 in Manchester, United Kingdom.

The objective was to provide a forum to discuss challenges, solutions and perspectives of ongoing research and standards development activities aimed at enabling an efficient and adaptive management of service-based applications across multiple clouds.

The workshop formed an international Program Committee, which included fourteen internationally recognized experts from nine different countries. The accepted research contributions will be published by Springer in the **Communications in Computing and Information Science (CCIS)** series. In addition to the presentations of the contributed papers, the workshop program included a shard opening keynote on the **OASIS TOSCA** initiative, an invited talk on the **OASIS CAMP** initiative, a round table on multi-cloud interoperability, and a session devoted to presentations of the development and initial results of 8 ongoing EU research projects. About 40 people from both academia and industry (e.g., IBM, Microsoft, ATOS and Cloudsoft) attended the workshop.



The workshop has been a success not only for the number of attendees and their positive feedback, but also for the enthusiastic participation to the round table and the wide range of research projects presented in the afternoon sessions. There were several aspects discussed by participants, focused around the multi-cloud domain and developing standards to enable the needed interoperability. A collection of key takeaways and more information about the workshop can be found in deliverable [D1.7.1](#) released by the consortium.

Events

SeaClouds organized the kick-off meeting in Barcelona at October 24-25, 2013, to ensure a smooth start of the project, and get agreement on the detailed plan for the first phase. Then, SeaClouds organized three plenary meetings in Milan, Malaga and Pisa, respectively, to ensure good progress of the project. The initial requirements, case studies, and architecture of the SeaClouds platform are deeply discussed and defined.

Meanwhile, SeaClouds has also participated in more than ten relevant conferences and workshops, so as to continuously raise the awareness of the SeaClouds project not only to its stakeholders, but also to the scientific and industrial communities as well. The focus of this first year has been the presentation of the project goals as well as the initial results regarding the reference architecture.

For more information about SeaClouds related events, please [click here](#).

Publications

SeaClouds has got a significant scientific production till now, which includes 3 journal papers and 13 conference papers.

Among these publications, one could distinguish the one that was released in the journal of **Software Engineering Notes** of the ACM Special Interest Group on Software Engineering (SIGSOFT SEN) entitled “*SeaClouds: An European project on seamless management of multi-cloud applications*”. It aimed at presenting the SeaClouds project objectives to the research community.

Another one was released in the Proceedings of the **17th Ibero-American Conference on Software Engineering** (CIbSE 2014) entitled “*SeaClouds: Seamless adaptive multi-cloud management of service-based applications*”, which aimed at giving an overview of the initial architecture of the SeaClouds platform, and was nominated to the best paper on the CIbSE 2014.

For more information about SeaClouds publications, please [click here](#).

What´s next

- **SeaClouds 1st Review meeting**
Brussels (Belgium) December 10th, 2014
- **4th SeaClouds General Assembly**
Tenerife (Spain) February 23rd – 25th, 2014
- **Interoperability Demo Days at UCC 2014**
ExCel London (UK) December 11th, 2014
- **Cloud Expo Europe**
ExCel London (UK) March 11th & 12th, 2015
- **2nd SeaClouds Scientific Workshop**
Place & Date to be confirmed

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