Dagstuhl Seminar Report: Security and Dependability for Federated Cloud Platforms, 2012

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The Security and Dependability for Federated Cloud Platforms seminar [3] was held in Schloss Dagstuhl[1], July 8-13, 2012. Schloss Dagstuhl, also known as the Leibniz-Zentrum für Informatik, is a renovated castle located in the scenic countryside of Saarland, Germany. Dagstuhl offers a unique concept: 30-45 participants, all of whom receive invitations from Dagstuhl on behalf of the organizers, stay in the castle during the seminar (typically 3-5 days) enjoying all that the castle has to offer. Amongst other things this includes an impressive library, a music room full of musical instruments, an excellent restaurant, as well as a wine cellar where a variety of cheese, wine and local beer is available daily for the late-evening social meetings.

The organizers of our seminar Matthias Schunter, Marc Shapiro, Paulo Verissimo and Michael Waidner targeted a four day event and gathered a mixed group of senior, established and promising young researches from all over the world. The program of the seminar was not set in advance, but most participants provided an abstract [3] and gave short talks on recent or ongoing work. The main purpose of these talks was generating discussion and collaboration among the participants. During some of the evenings, researchers formed work-groups and continued heated discussions fueled by wine, beer and cheese. For the younger participants, this was also a great opportunity to meet and get to know senior researchers in a very informal atmosphere – an opportunity that very few conferences can offer. To further foster the exchange of ideas, in addition to intense research sessions each seminar typically includes a group hike or an excursion. In our case, this included a river cruise and a visit to a local brewery. Many of the participants, and we are among them, found the seminar to be one of the most productive academic events they experienced so far.

The seminar targeted the management and protection of individual clouds and addressed the trend towards cloud federation by bringing together researchers from security, dependability and systems management. The idea was that only such an integrated approach is able to guarantee security and dependability while preserving the essential cost and efficiency benefits of today's emerging solutions. The challenge to address was how to provide secure and dependable services on such federated cloud platforms. Selected research questions were: How can clouds securely interoperate, how can service availability be guaranteed despite failures or attacks on individual clouds, how can existing al-

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[1]http://www.dagstuhl.de/en/

gorithms be adjusted to provide scalable consistency guarantees, and finally whether cloud-of-cloud infrastructures can provide such benefits at costs that are competitive with single cloud solutions. While these questions were addressed during the seminar it also became clear that research on the dependability and security of individual clouds remains an active and challenging area, and therefore was also discussed in depth.

The article that follows [1] is a result of one of the work-groups formed in the seminar. The group included Distributed Systems and Security researchers with very diverse views and focus areas. As a result, the article, named "Verifying Cloud Services: Present and Future", covers the topic from a wide range of perspectives, while at the same time offers a common framework and classification of the issues into four different areas: 1) verification of service identity; 2) verification of service functional correctness; 3) verification of service performance and dependability, and 4) verification of security policies. The authors believe that the collaboration, which included researchers from six countries and representatives from academia, research labs and industry, could not have been possible in any other

setting, and would like to thank Schloss Dagstuhl and the organizers of the seminar for this unique opportunity. Other works and new collaborations have emerged from discussions that started during the seminar, such as a recent study of the inherent properties of multi-cloud replication and their dependence on the interface provided by individual cloud storage services [2].

References

[1] S. Bouchenak, G. Chockler, H. Chockler, G. Gheorghe, N. Santos, and A. Shraer. Verifying cloud services: Present and future. *Operating Systems Review*, 48, 2013.

[2] G. Chockler, D. Dobre, and A. Shraer. Consistency and complexity tradeoffs for highly-available multi-cloud store. http://people.csail.mit.edu/grishac/mcstore.pdf, 2013.

[3] Rüdiger Kapitza, M. Schunter, M. Shapiro, P. Verissimo, and M. Waidner. Security and Dependability for Federated Cloud Platforms (Dagstuhl Seminar 12281). *Dagstuhl Reports*, 2(7):56–72, 2012.