Docker and Kubernetes at the university
Using container technology for science and teaching

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Container technology is getting more and more popular in recent years and has already significantly impacted the software development process and the operation of systems especially in the area of web applications. Docker provides a free and open-source platform for building and running container images in a controlled and isolated environment. Kubernetes, which is also free and open-source, provides an orchestration system which enables automated deployment and management of containerized applications. Around Docker and Kubernetes there exists a vast ecosystem of tools and services. At the Department of Computer Science 4 of the University of Bonn we recently started using these technologies in both science projects and teaching. With this talk we intend to share our experiences with other people which might use container technology in similar use cases.

Our presentation will be split in five sections, which will cover the following topics:

- Use cases: We will give a general overview about which applications for container technology exist within a university. Specifically, we intend to highlight the similarities and differences to normal software development, DevOps, etc.

- Science vs. Teaching: Container technology can be used in both science and teaching. However, the intended goals and also the needs and requirements of both areas may differ significantly.

- Implementation and Experiences: Based on the ideas and considerations described above we implemented a Kubernetes cluster in our department. We will give a detailed description of the cluster architecture and our experiences so far.

- Problems and "Lessons learned": As for every new project there are things which turned out to be more difficult than expected. We will talk about these problems and what we learned from that.

- Recommendations and Outlook: Concluding our presentation, we will give some recommendations to other people who intend to implement container technology in a similar scenario. We will also outline some of our plans for the future.