Story
How do you manage software development, which is written by a thousand scientists and engineers from over a hundred different countries, for unique and complex hardware? At CERN, the newest technologies are explored to tackle these problems.

To support a more efficient software development process at CERN, a platform was designed that provides browser access to on-demand-created environments (similar to virtual machines). This enables power-users to have full access and customization, while system administrators are still able to manage these environments and to provide access to them from anywhere. Furthermore, it allows running and testing code on these different environments.

Additionally, a light-weight web-based editor was created that supports the particular DSL and from which code can be run in a specific environment. The editor was based on Eclipse Orion technology and extended by reusing features from a previous desktop IDE. Since migrating a desktop IDE to a browser is not trivial, various extension techniques were designed.

The potential developer group comprises of about 800 users, so our solution had to be scalable. Various extensions and examples were given to make certain aspects of the platform scalable, one of which was the deployment of our platform on OpenStack (open-source cloud platform). Our platform can then be scaled on CERN’s OpenStack facility.
Challenges
The main challenge was to integrate many different technologies that were not designed to cooperate. Since the project took ten weeks, this integration had to be done very fast, while we had no expertise or knowledge about these technologies. Another challenge was the communication with the client, which was done remotely: using Skype-calls or emails. One way to overcome this was our weekly integration process, which also helped in showing results early.

Results
A proof of concept platform was developed that can provide custom or premade environments (similar to virtual machines) that are accessible through the browser. Moreover, a web-based editor was made of an earlier DSL-specific IDE. This web-based editor was connected with the rest of the system, such that code developed in the editor could be immediately deployed and run on various environments.

Benefits
The advantage of this platform is that all environments (similar to virtual machines) can be managed centrally, which is very helpful in maintenance and system administration. Furthermore, the platform can be used to increase the efficiency of hardware usage for large groups of users. Moreover, the web-based editor gives easy access to develop software that runs on complex environments. This is especially useful for CERN, where many developers work for a few weeks up to a few years. In general, this project explored new technology areas that are the basis to improve productivity in large heterogeneous developer groups at CERN.