



Bachelor Thesis

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# Flexible Configuration of Docker Containers

## Context

Docker is an open platform to build, ship, and run applications. It is often considered as a lightweight form of virtualisation that does not require full-blown virtual machines, but uses operating system mechanisms on the host system to achieve strong isolation and resource management. These isolated entities are called *Docker Containers*.

While Docker Containers are considered flexible, lightweight, and easy to use, they follow a configure-once principle. That is, once created, their configuration can only be changed to a very limited extend. For instance, the application command used at creation time cannot be changed, nor can any further network ports be opened as soon as the container has been created. While these restrictions do not hinder the boxing of many applications, they disable that docker is used in environments that require more flexibility.

## Scope of the Thesis

This thesis deals with the challenge of enhancing the configurability of docker containers. In order to fulfil this task, you should first target understanding how Docker containers work and how the yet unchangeable are represented and used in both the Docker Engine (the runtime system) and the underlying host operating system.

As a second step, a strategy shall be developed that defines how port configuration and start-up command can be changed for created but not running containers. In addition to that, a strategy shall be developed of how to change the port configuration of running containers on the fly.

## Requirements and Comments

If this thesis achieves good progress and outcome, its results are to be integrated in the PaaSage research project (<http://paasage.eu>) which is released under an OpenSource license. For that reason, we appreciate if you are ready to OpenSource your results.

This thesis will most likely touch the Linux kernel API or other low-level Linux functionality. For that reason basic knowledge and experience with Linux systems is recommended (but no must).

If you are interested in this or similar theses, please contact Jörg Domaschka either by mail or in directly in his office.

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