Testing Applications using Linux Containers

Matúš Marhefka  
supervisor: Ing. Aleš Smrčka, Ph.D.

Benefits

Using containers (Docker containers in particular) to create testing environments and running tests inside them have many benefits, for instance:
• quick setup of testing environment,
• tests reproducible across different machines, as all the configuration and dependencies are bundled in a single or few container(s),
• no influence on the host system or other containers running on the host system,
• ability to run tests in parallel.

Testing Applications Running in Docker Containers

The work addresses following testing tasks (including possible issues) when running tests in containers:
• creating a testing environment
• and deploying tests into a container or into an image,
• running tests inside a container,
• monitoring and managing process of testing,
• and gathering results of testing and analyzing potential problems.

Testing methods and framework

• Introduced three methods of testing applications in Docker containers.
• One method is used in the framework implementation.
• The framework consists of the core module which provides basic functionality and it is designed to be extensible with an additional custom code in form of a plugin.

• Plugins are used for implementation of custom testing methods and their different variants.

• The framework automates the repetitive work needed to be done when setting up testing environments, copying tests and gathering results of testing from Docker containers.
• It can be incorporated into larger testing suites targeting software containers validation and testing.