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Abstract

Many tech stars like Netflix, Amazon, PayPal, eBay, and Twitter are evolving from monolithic to a microservice architecture due to the benefits for Agile and DevOps teams. Microservices architecture can be applied to multiple industries, like IoT, using containerization. Virtual containers give an ideal environment for developing and testing of IoT technologies. Since the IoT industry has an exponential growth, it is the responsibility of universities to teach IoT with hands-on labs to minimize the gap between what the students learn and what is on-demand in the job market. That can be done by using containerization. There are many approaches in the containerization field, but they can be difficult to use without depth knowledge in virtualization and code encapsulation. After a deep analysis of the containerization challenges, we came with an idea of a microservice infrastructure based on Docker, which is an open- platform for developing, testing, and running applications using containers, to solve the virtualization and code-encapsulation problem. Our infrastructure will provide a code development and testing web-based platform that allow users to securely go in the process of containerization without spending research time in learning virtualization. So, students and researchers can focus more on the development and testing of algorithms and codes. For example, it will be easy to develop containers that allow sensors to connect to an external server in few cliques, or to run a python code in a total isolate process in minutes without downloading any containerization software.

Keywords: Microservices, web-based infrastructure, containerization, virtualization.