Featured Containerization Enterprise-Ready DevOps Engine Modeling with Microservices

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Abstract – As the DevOps practice, it needs to keep the complex system infrastructure in an efficient, secure, and flexible manner. Most of the time, industrial practice is to use monolithic computer system infrastructure with hybrid and/or multi-cloud infrastructure. While using these modules, the main problems that occur are, difficulty to archive data, system logs, and applications, difficulty to archive large VMs, large money payments for cloud services, difficulty to scale the infrastructure, difficulty to update and maintain the infrastructure and difficulty to use hardware and software efficiently. The main objectives of the research activity are to develop a conceptual and technically containerized DevOps engine, to orchestrate the containers architecture user friendly, to present a long-time data consistency approach, and create an agile DevOps platform to make easiness to apply DevOps practices. The proposed DevOps engine was deployed on the Docker container management platform and used separated Docker containers to deploy software applications and software services to obtain the enterprise-ready infrastructure by applying microservices architecture. The proposed platform was validated over the same infrastructure in a cloud environment by evaluating the identified research variables. By using light-weighted Docker containers, it is easier to scale, maintain, deploy, and manage enterprise-ready applications. The containers of the proposed DevOps engine were encapsulated components and all internal data of the containers were secured on one host operating system. Due to the fastness of the light-weighted Docker containers, the delivery of the software application to the production environment has been done with zero downtime of the system than the experimented results of the cloud infrastructure for the same configurations. Due to the portability of the Docker containers, was migrated they engine from one environment to another more easily than cloud infrastructure. Due to the results, the DevOps engine is applicable to ship enterprise software applications.

Keywords: Docker, Containerization, Microservices, DevOps