

Impact of Network Workload between Virtualization Solutions on a Testbed Environment for Cybersecurity Learning

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Abstract : The adoption of modern lightweight virtualization often comes with new threats and network vulnerabilities. This paper seeks to assess this with a different approach studying the behavior of a testbed built with tools such as Kernel-Based Virtual Machine (KVM), Linux Containers (LXC) and Docker, by performing stress tests within a platform where students experiment simultaneously with cyber-attacks, and thus observe the impact on the campus network and also find the best solution for cyber-security learning. Interesting outcomes can be found in the literature comparing these technologies. It is, however, difficult to find results of the effects on the global network where experiments are carried out. Our work shows that other physical hosts and the faculty network were impacted while performing these trials. The problems found are discussed, as well as security solutions and the adoption of new network policies.

Keywords : containerization, containers, cybersecurity, cyberattacks, isolation, performance, virtualization, virtual machines

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