ABSTRACT

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As Network Functions Virtualization (NFV) does not require specific *hardware* for each telecommunication service, the main challenge of this approach is the performance when compared to proprietary solutions. Thus, it is important to correctly choose the virtualization technology to be employed in a given network function in order to achieve good performance. Moreover, the right choice of technology allows better utilization of the benefits provided by virtualization, such as flexibility and scalability. To assist in this choice, this work presents a performance evaluation of two virtualization solutions that can be applied in NFV, KVM and Docker, when used to implement a virtualized HTTP proxy. KVM is a traditional virtualization platform, employing complete virtualization and para-virtualization concepts, while Docker implements lightweight virtualization across containers. The results show that Docker performs better than KVM, regardless of the type of virtualization implemented. Thus, Docker can achieve processing times for HTTP requests close to that of a non-virtualized solution, which is an initial requirement considered by the telecommunications industry when using virtualized environments to deploy network functions. However, in situations where flexibility and isolation are important, KVM may be more suitable since it uses a hypervisor layer to provide complete isolation of the virtual instance. This paper also shows that the use of para-virtualization in KVM improves performance, but not enough to overcome Docker. Thus, if better isolation is required and some performance loss is tolerable, KVM with para-virtualization is an alternative to Docker and its container virtualization.

Keywords: NFV; Proxy; KVM; Docker;