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Abstract

Since the emergence of software defined networking (SDN) and from the development of the OpenFlow protocol, it is possible to observe that this new paradigm of networks is revolutionizing the networks based on the IP protocol, allowing the creation of new mechanisms for provisioning of services, guaranteeing scalability and reducing costs. Although this new paradigm has been created for the centralization of the control logic, it is possible to decentralize it. In this scenario, subdividing the administrative domain into smaller subdomains and having each subdomain controlled by a controller has been an alternative to ensure scalability in SDN. This article proposes an architecture, here called OrchFlow, capable of receiving requests from applications and orchestrating them in order to provide the requested services in an OpenFlow network with multiple controllers. OrchFlow acts hierarchically and provides access to the network infrastructure in three distinct ways: Proactive, Reactive, and Hybrid. This article presents the architecture, implementation, and an extensive benchmarking using two of today’s leading OpenFlow controllers, Ryu and Floodlight.