

Abstract

Conventional networks are complex and challenging to operate. On top of that, they have limited flexibility to react to device failures and flow changes. On the other hand, server virtualization and cloud computing have made the server side of the Data Center become more flexible to the ever growing applications' requirements placing traditional networks in the spotlight. A new networking paradigm, Software-Defined Networking (SDN), purports to redress manageability, flexibility and scalability limitations of traditional networking by making use of network management centralisation and foster automation using network programmability.

The primary objective of this dissertation is to determine the current state of SDN implementations and identify what its top adoption factors are. In addition to this, this research evaluates what is the impact that the adoption of SDN will have on the network professionals. A lack of comprehensive academic research on what the top adoption factors of SDN are and its impact on network engineers seems evident.

This exploratory research adopted a positivist methodology. It applied a quantitative approach to data gathering via an online survey. The findings, relevant to organisations planning or currently involved in SDN initiatives, network engineers and academic researchers, conclude that the majority of organisations will be involved in SDN initiatives within the next two years. The simplification of network provisioning and configuration, the better utilisation of network resources and the ability to perform traffic engineering proved to be the top adoption drivers. On the other hand, organisations identified the challenges of integrating SDN with legacy networks, the immaturity of vendor solutions and the immaturity of OpenFlow as the top inhibitors of SDN adoption. Furthermore, network engineers predicted changes in the structure of their teams and found imperative to master programming skills for them to stay relevant in the market. This research culminates with a proposed framework for SDN-SWOT analysis and a roadmap to help organisations overcome the challenges identified in integrating SDN whilst maximising the benefits.