Chapter 17
A Thorough Investigation of Various Goals and Responses for Mobile Software-Defined Networks

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ABSTRACT

Cloud computing has caused some companies to modify their IT infrastructure and maintenance procedures and may eliminate their current hardware altogether. Conventional methods of setting up a switch or router may be error-prone and unable to make full use of the capabilities of current network architectures. As many intelligent networking designs as possible must be developed for intellectualization, activation, and customization in future networks. Due to software-defined networking (SDN) technology, it's possible to control, secure, and optimize network resources, eliminating the rigid coupling between the control plane and the data plane in traditional network architectures. Here, the chapter explores the problems, difficulties, and potential solutions associated with software-defined networks (SDN), a novel concept in computer networking. Through SDN, the network gains the ability to be programmable, quick, and adaptable thanks to its separation of data and its ability to control traffic.

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INTRODUCTION

Networking is an exciting intellectual and technical area because technology allows people and their computers to connect with each other. A network is a group of computers (called nodes) and transmission lines (called links) that allow communication over long distances (Cabaj et al., 2018). Navigating hardware switches has become more difficult as network size and demand increase. Companies running highly virtualized systems with huge networks have found manually configuring individual network soft switches to be extremely difficult and time-consuming (Guleria, 2017). Switches, routers, and other physical hardware are used in traditional networks to make connections and operate the network. However, this is where software-defined networking (SDN) comes into play.(IEEE et al., 2015). AS SDN is considered a popular alternative to conventional networks because it allows IT administrators to add additional bandwidth and physical infrastructure services at no additional cost. SDN is a network strategy that provides network administrators with the ability to configure, monitor, modify, and manage network operations using open interfaces such as the Open Flow protocol programmatically. The application, control, and data layers make up the three tiers of this design.

TRADITIONAL NETWORKING

A traditional network is constrained by both the size of the network and the requirements of various services. It is important to note that these requirements cover reliability, virtualization, flow management, engineered traffic, and implementation of policy requirements.(Al-Haddad & Velazquez, n.d.) There has been an increase in the complexity of network architecture and management over the last few years. We are in the process of connecting everything, thanks to enabling technologies like cloud computing, portability, and newly emerging ideas such as IoT (internet of things)(Al et al., 2022). Due to the complexity and reliability of these new concepts, improved data center infrastructure as well as more bandwidths are required, as they call for a simpler, more resilient network infrastructure. For managing network traffic, the most widely used type of networking is traditional networking, which uses switches, routers, as well as dedicated hardware with fixed functions to provide network management services (Haji et al., 2021) The gadgets on this list perform different functions and complement each other to provide support to the network as a whole. It is common for traditional networks to suffer from issues of scalability as a result of their inherent nature. In the majority of switching hardware and software, provisioning APIs are rarely if ever available, and most of the switching hardware and software that are available are proprietary and difficult to access. It is important