

Service-Oriented Network Virtualization toward Convergence of Networking and Cloud Computing

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Abstract: *A holistic approach that makes it possible to control, manage, and optimize both computing resources and networking in a Cloud environment is required because of the crucial role that networking plays in Cloud computing. This results in a convergence of networking and Cloud computing. As a crucial feature for the next generation of networking, network virtualization is being implemented in the Internet and telecommunications sectors. It is anticipated that virtualization will bridge the gap between these two fields as a potential enabler of profound changes in the communications and computing domains. When applied to network virtualization, Service-Oriented Architecture (SOA) creates a Network-as-a-Service (NaaS) paradigm that may significantly facilitate the convergence of networking and Cloud computing. The use of SOA in network virtualization has recently received a lot of attention from both academia and industry. Although numerous pertinent research papers have been published, they are currently dispersed across a variety of subject areas in the literature, such as cloud computing, telecommunications, computer networking, and Web services. Specifically, we first introduce the SOA principle and review recent research progress on applying SOA to support network virtualization in both telecommunications and the Internet. In this article, we present a comprehensive survey of the most recent developments in service-oriented network virtualization for supporting Cloud computing, particularly from the perspective of network and Cloud convergence through NaaS. Next, we discuss the most recent advancements in network service description, discovery, and composition, as well as a framework for network-to-cloud convergence based on service-oriented network virtualization. We also talk about the problems these technologies face because of network-cloud convergence and the research opportunities in these areas. Our goal is to get researchers interested in this new interdisciplinary field.*

Keywords: Network virtualization, the service-oriented architecture, cloud computing, network-as-a-Service (NaaS)

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