Cloud and Edge Computing

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Cloud and edge computing are currently undergoing a substantive transformation on several fronts, from applications to hardware, and from architectures to devices. This issue of the Cloud and Edge Computing Series solicited articles in the area of cloud and edge computing to address the main issues concerned with evolving processes and supporting pedagogies and applications in cloud computing, networking, and storages technologies. There have been advances on both the cloud and edge computing fronts that have affected this line of technology. Paradigms such as computing in virtualization-based architectures, issues on geographical constraints for deploying clouds, and the use of SDN/NFV in clouds, for example, were of special interest for this issue of the Series. Nevertheless, our attention was also focused on data center network (DCN) architectures, security, load balancing, and application data streaming supported by evidence from simulations, analysis, or experiments. The last but not least important factor we expected to see in articles was the standardization aspects of cloud and edge computing technology. We were especially interested in articles that could address communications standards in networking for clouds, fogs and edge computing.

This issue presents a first article that is exemplary of the transformation of traditional IP routers and functions in virtualized software entities, where SDN is an essential enabler for NFV as it provides the flexibility of network infrastructure needed by NFV. Canonico and Romano present a system for managing multicast distribution trees in a hybrid IP/SDN network. Distribution of live multimedia streams to a high number of end users through the Internet is a big challenge for both network operators and content providers. The need for efficient and flexible management platforms for content distribution infrastructures has been recognized and addressed by all the standardization for operating in the field of telecommunications. In this article, the authors show how ISP operators managing IPTV infrastructures in their network can gradually introduce, thanks to the virtualization of network function (i.e. VNF), SDN management systems into their legacy IP based infrastructure leveraging. This approach makes it possible to build hybrid IP/SDN networks, where network nodes behave as traditional IP routers by default, but whose packet forwarding behavior may be customized for specific flows thanks to an OpenFlow-enabled control plane.

Biographies

NADER F. MIR (nader.mir@sjsu.edu) is a professor and former associate chair of electrical engineering at San Jose State University in California. He received his Ph.D. degree from Washington University, and has consulted for leading companies such as Google and Cisco. Internationally known for his scholarly work, he has spoken at many leading conferences, and has published nearly 100 refereed papers and a successful book entitled *Computer and Communication Networks*. He has held several IEEE journal editorial positions, and served on many organizing committees of conferences. He was granted a U.S. patent, and is the recipient of prestigious teaching and research excellence awards.

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