

Network Function Virtualization: Research Challenges and Recent Advances

Abstract: Network Function Virtualization (NFV) is an emerging paradigm that has opened a large window of opportunities for resource usage optimization in enterprise, datacenter, and backbone networks, to mention a few. NFV enables network managers to replace specialized middlebox hardware (performing functions such as firewalling, intrusion detection, load balancing, content caching, etc.) with equivalent, software-based network functions, running on top of commodity, off-the-shelf hardware. There are several ways in which network managers can potentially benefit from this paradigm. For example, it breaks dependency on specialized middlebox hardware, which has traditionally accounted for a large fraction of network complexity and total cost of ownership in most organizations. For some of these organizations, the number of middleboxes deployed is comparable to their L2/L3 infrastructure. As another benefit, NFV enables promptly responding to fluctuations in the aggregated flow traffic through dynamic, on demand (de)allocation/dimensioning of network functions. The potentialities of NFV has made it gain an important support from industry, as one can note from existing, ongoing standardization efforts. NFV has also seen some intense research activity in the past two years, including (a) creating technical conditions for deploying and running networks functions in a virtualized environment, (b) optimizing virtual network function placement and chaining, and (c) devising orchestration mechanisms so as to adapt the virtualized function environment to fluctuating demands. In many of these aspects, NFV has benefited significantly from Software Defined Networking (SDN), which has supported automated steering of flows across deployed functions and, consequently, key management features such as load balancing and policy compliance. In this talk, I will revisit some of the most relevant research challenges in the NFV/SDN realm and present what we have been investigating (on the topic) at INF/UFRGS.

Bio: Luciano Paschoal Gasparry holds a Ph.D. in Computer Science (UFRGS, 2002) and serves as Deputy Dean and Associate Professor of the Institute of Informatics, UFRGS. From 2008 to 2014, he worked as Director of the National Laboratory on Computer Networks (LARC) and, from 2009 to 2013, was Managing Director of the Brazilian Computer Society (SBC). Prof. Gasparry has been involved in various research areas, mainly computer networks, network management and computer system security. He is author of more than 120 full papers published in leading peer-reviewed publications and

has a history of dedication to research activities such as organization of scientific events, participation in the TPC of relevant symposia, and participation as editorial board member of various journals. In 2016, Prof. Gasparry has been appointed as Associate Managing Editor for the Springer's Journal of Network and Systems Management and Publications Committee member of the IEEE SDN initiative. His current research interests include: network, service, and application management; computer system security; software-defined networking; network function virtualization; network virtualization; and cloud computing. More information about Prof. Gasparry can be found at <http://www.inf.ufrgs.br/~paschoal/>.