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End-to-End Control and Management of Multi-AS Virtual Service Networks Using SDN and Autonomic Computing Architecture

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Abstract : Automated and end-to-end network resource management and provisioning for virtual service networks in a multiple autonomous systems (a.k.a multi-AS) environment is a challenging and open problem. This paper proposes a novel, scalable and interoperable high-level architecture that incorporates a number of emerging enabling technologies including Software Defined Network (SDN), Network Function Virtualization (NFV), Service Oriented Architecture (SOA), and Autonomic Computing. The proposed architecture can be used to not only automate network resource management and provisioning for virtual service networks across multiple autonomous substrate networks, but also provide an adaptive capability for achieving optimal network resource management and maintaining network-level end-to-end network performance as well. The paper argues that this SDN and autonomic computing based architecture lays a solid foundation that can facilitate the development of the future Internet based on the pluralistic paradigm.

Keywords : virtual network, software defined network, virtual service network, adaptive resource management, SOA, multi-AS, inter-domain
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