

Attestation of Trusted and Reliable Service Function Chains in the ETSI-NFV Framework

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Abstract

The new generation of digital services are natively conceived as an ordered set of Virtual Network Functions, deployed across boundaries and organizations. In this context, security threats, variable network conditions, computational and memory capabilities and software vulnerabilities may significantly weaken the whole service chain, thus making very difficult to combat the newest kinds of attacks. It is thus extremely important to conceive a flexible (and standard-compliant) framework able to attest the trustworthiness and the reliability of each single function of a Service Function Chain. At the time of this writing, and to the best of authors knowledge, the scientific literature addressed all of these problems almost separately. To bridge this gap, this paper proposes a novel methodology, properly tailored within the ETSI-NFV framework. From one side, Software-Defined Controllers continuously monitor the properties and the performance indicators taken from networking domains of each single Virtual Network Function available in the architecture. From another side, a high-level orchestrator combines, on demand, the suitable Virtual Network Functions into a Service Function Chain, based on the user requests, targeted security requirements, and measured reliability levels. The paper concludes by further explaining the functionalities of the proposed architecture through a use case.

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