In-Network 2030 Computation and Programmability

Abstract:

This presentation will articulate the concepts, design, technologies and architectures enabling In-Network Computation and Programmability (I-NCP) applicable to Network 2030.

I-NCP is both an old and new approach and network principle. While its scope and definition continue to evolve, there is reasonable level common understanding of the key central role it will play in future network and service delivery scenarios.

In-Networks computation and programmability refers to executable code that is injected or activated into the execution environments of network elements in order to create the new functionality or new configuration at run time with the required security characteristics and guarantees. The basic approach is to enable trusted third parties (tenants, operators, and service providers) to activate application-specific services (in the form of code) into safe execution environment in the network. Network services may utilize this approach in terms of optimized network resources and, as such, they are becoming network aware. The behavior of network (computation, connectivity and storage) resources can then be customized and changed through a standardized programming interface for network control, management and servicing functionality.

The significant value of in-network programmability will be seen in terms of practical solutions applicable to parts of the future network and as well as of dynamic and non-disruptive control, operation, deployment and scaling of network and network service functions at the edge, core and access.

This talk will address results & SoA solutions in in-network computation and programmability, use cases, standards, architectures, high performance execution environments and network management. This talk will conclude with identifying research and development challenges in I-NCP.