

# EION BYTES

## SDN and NFV enable Network Slicing and Edge Computing in Wireless Networks

Wireless networks are evolving to meet the diverse and dynamic demands of users, applications, and services.

They rely on two key technologies:

- Software-Defined Networking (SDN)
- Network Function Virtualization (NFV).

In this article, you will learn how SDN and NFV enable network slicing and edge computing in wireless networks and what benefits they offer for network performance, flexibility, and innovation.



### What are SDN and NFV?

SDN and NFV are complementary technologies that aim to make networks more agile, scalable, and efficient. SDN separates the control plane from the data plane, allowing network operators to centrally manage and program network resources, policies, and functions. NFV decouples network functions from dedicated hardware devices, enabling them to run as software applications on virtual machines or containers. This reduces the need for expensive and inflexible physical infrastructure and allows network operators to deploy, scale, and update network functions on demand.

Features	SDN	NFV
Name	Software Defined Network	Network Function Virtualization
Platform	Corporate IT	Service Provider
Initiative Supporters	Enterprise Network and Software Vendors	Totally Telecom Service Provider
Protocol	OpenFlow	It does Support OpenFlow
Application Run	On industry standard servers	On industry standard servers
Customer Benefits	Drives down Complexity	Drives down Complexity and increase agility
Strategy	Split control & data forwarding planes	Replace network devices with Software
Hardware	SDN Controller- Main	Virtualized devices on Standard X86 servers
Where in the Network	Layer 2-3 optimization	Layers 3-7 Optimization
Standards	Open Networking Foundation (ONF)	ETSI Standards
Applications	Datacenters and Cloud Orchestration	Routers, FWs, LBs, CDNs, WAN Acceleration

## What is Network Slicing?

Network slicing is a technique that allows network operators to create multiple logical networks on top of a shared physical infrastructure. Each network slice can have its characteristics, requirements, and capabilities tailored to the needs of a specific service, application, or user group. For example, a network slice for IoT devices may have low bandwidth, high reliability, and long battery life. In contrast, another network slice for video streaming may have high bandwidth, low latency, and high quality of service. Network slicing enables operators to optimize resource utilization, improve service differentiation, and support various use cases.

## How do SDN and NFV enable Network Slicing?

SDN and NFV are essential for implementing network slicing in wireless networks. SDN provides the orchestration and coordination of network slices across different domains, layers, and technologies, ensuring end-to-end connectivity and consistency. NFV provides the flexibility and efficiency of deploying and managing network functions as software applications on virtualized resources, allowing network operators to customize and adapt network slices to changing demands. Together, SDN and NFV enable network slicing to be dynamic, scalable, and programmable.

## What is Edge Computing?

Edge computing is a paradigm that brings computation and storage closer to the end users or devices rather than relying on centralized cloud servers. Edge computing reduces the latency, bandwidth, and energy consumption of data transmission and enhances the privacy, security, and reliability of data processing. Edge computing enables applications and services that require real-time, context-aware, and intelligent interactions, such as augmented reality, autonomous vehicles, and smart cities.

## How do SDN and NFV enable Edge Computing?

SDN and NFV also facilitate edge computing in wireless networks. SDN enables the seamless integration and coordination of edge nodes and cloud servers, providing unified network management and control. NFV enables the deployment and migration of network functions and applications across edge nodes and cloud servers, providing flexibility and scalability. Together, SDN and NFV enable edge computing to be adaptive, responsive, and efficient.

## What are the benefits of Network Slicing and Edge Computing?

Network Slicing and Edge Computing can offer several advantages for wireless networks, such as optimizing network resources and reducing latency to improve performance, increasing network flexibility to enable dynamic adjustments, and fostering innovation by creating new services and applications. These technologies can also enhance the quality of service for different applications and services, as well as support diverse and emerging use cases.

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