

NFV AND SDN ARE NOT THE SAME. HERE'S WHY.

Software-Defined Networking (SDN) and Network Functions Virtualization (NFV) are two of the hottest topics in the networking world today. To many, the two terms are interchangeable, but the reality is that they represent two different aspects of the future of networking. And, while the technologies do intersect, they are not at all the same thing. The confusion seems to stem from three commonalities:

- **Timing:** The concepts emerged at approximately the same time frame
- **Compatibility:** NFV and SDN can be used together
- **Virtualization:** A variety of new technologies are involved

At this point in time, NFV is primarily the domain of the telco and carrier operators due to the urgency of their business drivers. They have demanded new technologies that are easy to scale and that accelerate service deployments, while improving their business models by reducing the need for expensive, purpose-built hardware. SDN, meanwhile, has seen its initial use cases spread across data centers and campus-wide environments to provide much-needed flexibility and programmability. The crossover point in the market has

been with Cloud Service Providers (CSPs) who have both the business urgency and the data center need. CSPs demonstrate that SDN and NFV are often complementary and can be implemented together, but the spectrum of potential use cases is very broad and there is no requirement to do so.

Defined Differences

One of the key differences is that SDN separates the control plane that governs a network from the forwarding plane that sends packets through it, giving IT more control over the behavior and performance of their networks. SDN addresses the management complexity of rapidly growing and distributed networks by centralizing control and enabling programmability to achieve desired behaviors.

In contrast, NFV takes the network processes that are traditionally associated with specialized proprietary hardware (such as routing, firewalls, and application delivery controllers) and converts them to virtualized software platforms that can run on standard commodity hardware, most commonly x86 servers. These functions can be moved within a network on demand and scaled up and down as needed, without the delay and cost of installing new hardware devices. In addition, NFV enables fast/low-cost feature upgrades, which enables rapid innovation in service offerings (months or quarters instead of years or decades), due to soft implementation. SDN can't promise this.

Some experts say that SDN is a new way to manipulate the network, and NFV is a new type of infrastructure to be manipulated. In this way NFV is a transition to new system architectures and the new network designs enabled by that flexibility, while SDN enables an abstracted way to manage and control the overall network.

SDN as a Growth Catalyst

The ability to abstract the control of the network has ignited a long-term fundamental change to network design; more importantly “who gets to do network design.” This has created a power shift away from entrenched vendors. Customers and smaller nimble vendors can now do network design at many levels that were previously blocked by the vertical old-guard solution. New protocols such as OpenFlow are being adopted by a wide range of users, from leading vendors to start-ups looking to jump on the SDN bandwagon. And while vendors can offer additional features in their hardware to differentiate their products, a substantial portion of these new technologies are derived from open community design, reducing the limitations of single-vendor networks and creating a much smaller degree of lock-in than with traditional, fully proprietary systems. *That means greater IT flexibility.*

Further, the complete abstraction of the network control layer means that upgrades to the SDN environment are software-based and don’t require replacing specialized hardware devices. With SDN, rapid changes to network configurations—as business models evolve—become a simple contributor to growth, rather than a stumbling block to innovation.

SDN and NFV: Differences At a Glance	
SDN	NFV
SDN is a new model for network management—not a product—that enables automation, traffic engineering, and more	NFV is the virtualization of specific network functions, such as routing, switching, and firewalling
SDN enables the centralized management of increasingly complex and virtualized data centers	NFV saves countless man-hours and overhead costs, but can add to network complexity
SDN does not require NFV	NFV does not require SDN
But, SDN and NFV can work together	
SDN is a new way to manipulate the network	NFV is a new type of infrastructure to be manipulated

NFV Is Faster and Less Expensive than Status Quo Networking

With NFV, appliance-type tasks that were formerly handled by expensive, dedicated equipment can now be moved to NFV-aware equipment that can be configured to serve multiple purposes, virtualizing the tasks formerly assigned only to the dedicated hardware. For back-end operators, telcos, and other large carriers, this is a major advantage.

Traditional technologies currently fill telco and carrier data centers and client connections with a multitude of specialized hardware devices and multiple hardware vendors, each of which has its own hardware and software upgrade path. The NFV model allows not only for the use of powerful, low-cost server hardware, but also the ability for organizations to deploy and/or update services much more quickly than what occurs in status quo operations. With NFV, the old model of taking hours, days, or even weeks to commission and decommission dedicated hardware solutions becomes a thing of the past.

The targeted end result of NFV is reduced OpEx (and to a lesser degree reduced CapEx). The requirement to buy dedicated hardware and force over-provisioning to accommodate

potential growth is drastically reduced, as thin provisioning and agile deployment cycles become the new norm. In addition, ongoing costs for space, power, and cooling are reduced by using powerful, dense virtual servers.

Virtualization is now a well-established technology and the question for most organizations isn’t whether an SDN or NFV solution can deliver better results, but rather *what kind* of deployment makes the most sense. The first step to realizing the benefits of a virtualized solution should be to select a provider and schedule an “incremental consultation.” In this approach, an expert will evaluate your current infrastructure and recommend the SDN or NFV solutions best suited to your particular environment and ultimate business needs. While SDN or NFV may not be right for every organization today, the inherent business benefits are apparent—and now is the time to start evaluating the path to the future.