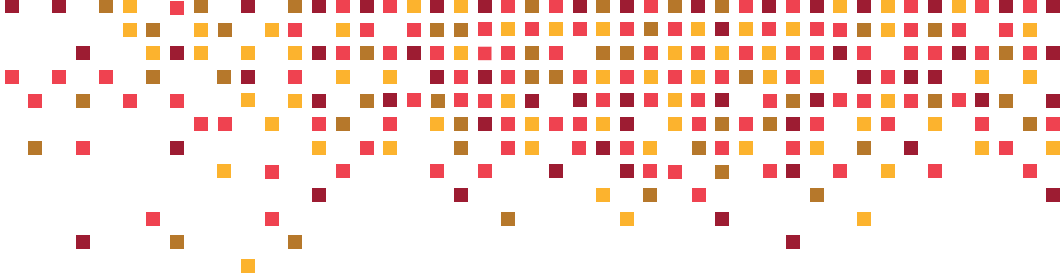

FREQUENTLY ASKED QUESTIONS: UNDERSTANDING THE BENEFITS OF SDN IN HEALTHCARE

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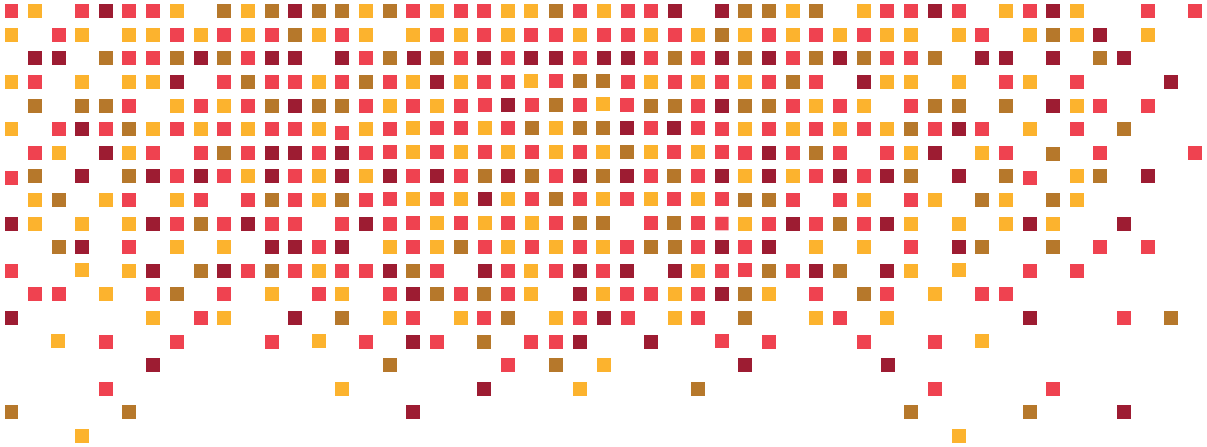
From Nokia

Abstract

Healthcare IT professionals are under pressure to upgrade their networks and data centers to address challenges with compliance, data protection, management complexity, mobility and accelerated development of new applications. Software-defined networking, or SDN, is beginning to play an important role as an enabling technology for healthcare organizations. With SDN, IT can automate many of the tasks involved in network management and compliance, with an architectural approach that becomes an asset for fast and agile deployment of applications.

This article explores the benefits of SDN in healthcare by answering five of the most important questions healthcare IT leaders are asking, including an overview of SDN and how it differs from legacy networking architectures. The article describes some of the ways in which SDN can enhance development, support compliance, improve security and strengthen key areas such as business continuity and disaster recovery. In addition, the article describes some of the features and characteristics to look for in an SDN vendor.



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The rise of SDN

Software-defined networking (SDN) is an important innovation for enterprise data centers that is beginning to play a significant role in enhancing agility, manageability, security and compliance for a wide range of organizations, including many in the healthcare industry.

Between 30% to 40% of all networking spending will be allocated for SDN between now and 2018, according to one study, meaning the SDN market will reach as high as $35 billion by 2018.[1] There are a wide range of reasons for such high expectations of SDN, based on the myriad benefits it can deliver to address the challenges of today's data centers, including:

- **A more agile environment for test and development,** with a network platform that is simple to deploy and manage—ensuring that network changes are no longer a bottleneck for developing new applications, but, instead, are an asset for fast and agile deployment.
- **Much simpler manageability and scalability,** freeing up IT personnel and resources for more strategic purposes, while enabling the overall organization to be more responsive to the needs of patients, clinicians, administrators and other employees.
- **Support for open, heterogeneous environments,** in stark contrast to the proprietary platforms that are still a surprisingly large part of today's legacy network environment.
- **Improvements in security and compliance management,** with granular control that supports consistent policy management and enables secure authentication at the user, application and device levels—which is becoming increasingly important as healthcare organizations continue to embrace mobile solutions for clinicians and other care providers.
- **Enhanced disaster recovery capabilities,** with a virtualized approach to network deployment that allows the IT organization to restore networks with greater speed and accuracy to ensure higher availability of critical applications and services.

The benefits of SDN play particularly well in healthcare environments. Although each healthcare IT organization has its own challenges, there are important trends and challenges taking place in healthcare that are common to many organizations. These include:

- **A stricter regulatory compliance environment**, which is a global phenomenon.
- **The need to support virtualization**, typically across a number of facilities on a campus or spread out over a wide geographic area.
- **High bandwidth requirements** to quickly transfer large files for medical procedures such as MRIs or EKGs.
- **Enhanced mobility** for practitioners and equipment, i.e., having smaller and more mobile machines stored locally so they don't have to be moved around between facilities.
- **Advanced data protection capabilities** to protect the confidentiality of patient information as use of electronic health records continues to proliferate.

1 "SDN Market Size, April 2013," SDNCentral

IT professionals in healthcare will undoubtedly be assessing SDN in the near future, if they aren't doing so already. What are some of the key questions you may be asking? Here are five that will help you understand the benefits of SDN for healthcare environments:

Q: What, exactly, is SDN and how is it different from my legacy architecture?

A: In traditional legacy networks, all of the functions of a switch or a router are on the same device. Therefore, the data path and the control path are linked together, sometimes using a proprietary architecture that makes it difficult for switches from one vendor to work with those from another vendor.

In SDN architecture, the data path is separated from the services and control functions. The control plane and services plane can be abstracted from the network equipment in much the same way that the control and services functions of a virtual server are abstracted from the physical server.

In an SDN solution, you want to make sure that the architecture you choose supports both a network services controller and an advanced policy and analytics engine. These will be necessary to handle functions such as high-level routing, security, authentication, policy management and many others.

By separating and abstracting network control and service from the forwarding plane, the organization gains far more flexibility than ever before. Network control and service functions are now programmable and can managed in a much more granular manner. As described by the Open Networking Foundation: "The result is an extremely dynamic, manageable, cost-effective, and adaptable architecture that gives administrators unprecedented programmability, automation and control."[2]

Q: How does SDN address some of our challenges with accelerating time-to-market and increasing agility?

An important challenge for healthcare environments is the ability to develop new services quickly. As we have seen with the rapid adoption of mobile devices in healthcare settings, getting the right information quickly into the hands of clinicians at the right time in the right location can make the difference in improving the quality of patient care.

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SDN accelerates the development cycle significantly. Developers can seamlessly use a shared resource pool for test and development cycles without affecting production environments. With network virtualization and abstraction, they can set up new test networks easily and experiment with different approaches, so that proof-of concept and prototype applications can be created faster and with a greater number of iterations to improve quality.

2 "ONF Overview," Open Networking Foundation home page

Q: How does SDN improve our organization's ability to maintain compliance with industry regulations such as those contained in HIPAA and the Affordable Care Act?

A: In healthcare, regulatory compliance can be complicated and subject to constant change. SDN makes it much easier to adapt to changing requirements by automating many of the functions involved in managing network equipment and security policies.

With traditional networks, operations teams typically have to go through a manual process of distributing network policies on all elements of the network whenever a change is needed: For example, when a password change is required, or when a new application is launched and a service policy has to be changed across the network.

With SDN, policy-based networking can centrally enforce these changes while assuring that the new policy is pushed throughout the network. The SDN architecture can provide for a tracking and auditing mechanism for all changes, thus ensuring that the network platform is delivering information to only those individuals who have the proper approvals.

In addition, by centralizing policy management, SDN provides a single, easy location for auditing and compliance reporting. This makes it much simpler for the IT organization to satisfy government compliance requirements, such as those mandated by the Affordable Care Act.

Q: Security is of critical importance in healthcare, particularly with protecting the confidentiality of patient records. What impact does SDN have on security?

A: Healthcare organizations are particularly challenged by the need to strengthen security and data protection across a range of systems and networks and, increasingly, public, private or hybrid clouds. Any compromise to the integrity and confidentiality of patient information is one of the biggest risk factors facing healthcare facilities today.

The separation of network control and hardware functions in SDN provides the opportunity for a much more secure architecture across all environments. The IT organization can take a granular approach to managing the network, ensuring that access mechanisms directly match the existing security and operational models of the organization.

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As a result, SDN can enable the organization to simply create specific security requirements and policies for applications, devices and users. Coupled with a programmable analytics engine available in certain SDN solutions, security and data protection safeguards can not only be deployed much more easily, but they can also be monitored in real time for much faster problem resolution.

Q: Where else can our organization benefit from using SDN?

A: The IT organization will benefit greatly from SDN because many of the time-consuming manual tasks involved in network provisioning and deployment will now be automated. This not only frees up time for more strategic endeavors, but it also

The dynamic nature of SDN makes it simpler for healthcare IT to back up and restore networks faster

ensures greater accuracy and consistent policy management and enforcement. IT operational expenses will go down and productivity will go up.

SDN will also improve disaster recovery and the availability of applications and services. The dynamic nature of SDN makes it simpler for healthcare IT to back up and restore networks faster—getting the organization up and running more quickly than traditional network approaches would allow. With SDN, IT teams can improve high availability and disaster recovery by:

- Moving or mirroring applications to a backup site in a private or hybrid cloud.
- Using virtual networks to scale between physical locations.
- Enabling applications and workloads to be instantiated based on hierarchical policy rules of the organization.
- Centralizing control and visibility of network functions and performance across disparate physical locations.

Taking the next step

The benefits of SDN are especially valuable to healthcare organizations because it addresses their needs for nimble applications development, reduced management complexity, enhanced security and simplified compliance, among others. The opportunity is to begin deploying SDN now, to address today's challenges with a solution that will position you strongly for future growth and innovation.

In choosing an SDN solution, it is important to note that there are several approaches, with many vendors jumping onto the bandwagon. You want to make sure you choose a vendor with an open approach and a rich background in building large and complex networks.

Nuage Networks, an Nokia venture, has taken a breakthrough approach to SDN that is garnering important industry recognition, including a Cool Vendor in Enterprise Communications designation by Gartner,[3] and a TMC Excellence in SDN Award.[4]

Nuage has completed a wide range of successful customer trials and deployments, consistently delivering SDN capabilities that remove the network constraints of legacy environments.

Nuage solutions transform the physical network into a simple-to-manage, rack-once and wire-once, vendor-independent IT backplane. With Nuage, network resources within and across data centers can be treated as an elastic resource pool that can be consumed and repurposed on demand.

Are you ready to take the next step in evolving your data center networks for the cloud era? Contact Nuage Networks to get started, at **largeenterprise@nuagenetworks.com** or **(877) 425-8822**.

3 "Gartner Research Names Nuage Networks a 'Cool Vendor' in Enterprise Communication Strategies," Yahoo! Finance, Oct. 1, 2014

4 "TMC Announces the 2014 Excellence in SDN Award Winners," TMC, April 15, 2014

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