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Get ready for your journey into the cloud era with software-defined access networks

Nokia SDAN starter-kit service

White paper

A cloud-native, software-defined access network (SDAN) that supports containerized network functions, zero-touch and agile operation, network slicing and end-to-end orchestration is fundamental for communications service providers (CSPs) to compete and succeed in the gigabit broadband era.

Nokia SDAN starter-kit gives CSPs a structured approach to understand the benefits of SDAN and be better prepared before implementing this industry game-changer.
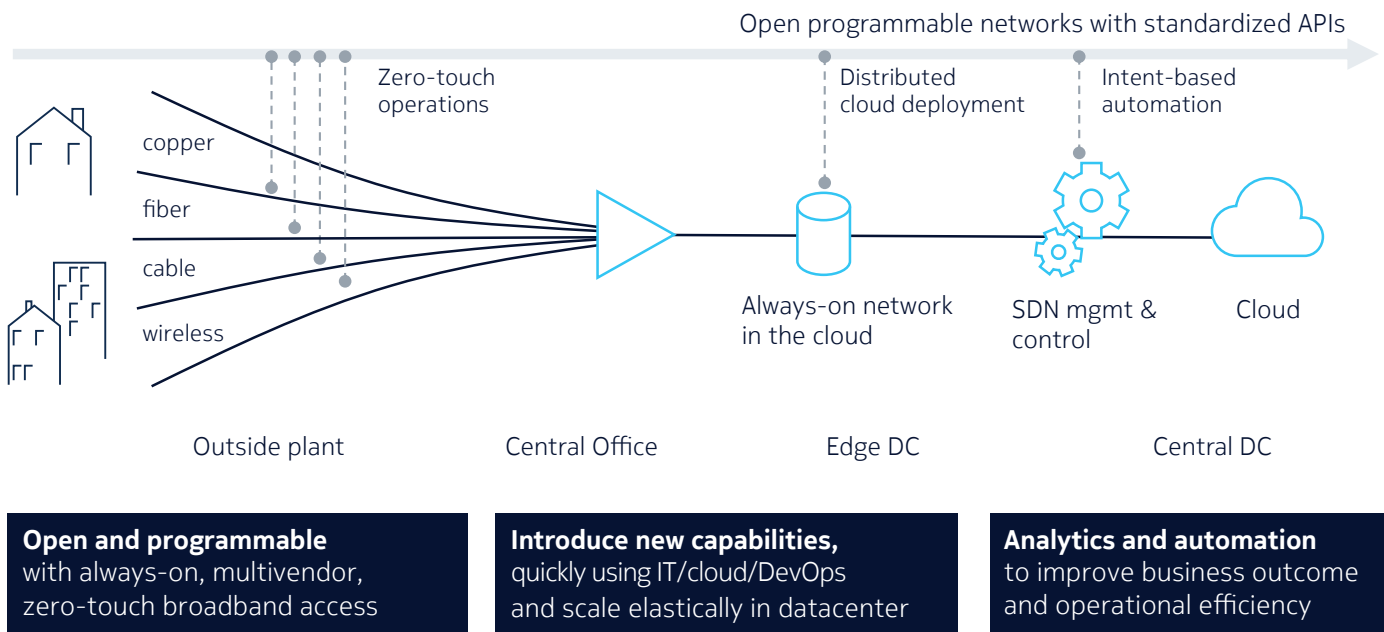
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Introduction

Fixed access network solutions have enjoyed growth in recent years thanks to technology evolutions and innovations in copper (G.fast), fiber (XGS-PON and NG-PON2), cable (distributed access architectures) and wireless (fixed wireless access). Current solutions have generally been developed in a monolithic approach with proprietary interfaces to the OSS and IT systems, which reduces flexibility in hardware dimensioning and software integration. Virtualization allows operators to automate the network and unlock new capabilities with smart, cloud-native access. Global network function virtualization (NFV) technology investment is projected to grow from $17 billion in 2019 to $45 billion in 2025. The fixed access network is on the cusp of embracing cloud and virtualization.

Software-defined access networks (SDAN) uses software-defined networking (SDN) and NFV to speed up innovation cycles, leverage cost-effective data center platforms that simplify IT integration, and scale up the ability to program and automate the network.

Figure 1: Open programmable networks with standardized APIs

Open and programmable with always-on, multivendor, zero-touch broadband access

Introduce new capabilities, quickly using IT/cloud/DevOps and scale elastically in datacenter

Analytics and automation to improve business outcome and operational efficiency

Increasingly, CSPs are convinced that a cloud-native access network that supports containerized network functions, zero-touch operation, network slicing and end-to-end orchestration reduces OPEX and speeds up innovation in a multivendor and open environment. Getting your network ready for cloud is a priority as virtualization is a game changer, and essential for competing in the gigabit broadband era.

Challenges

While SDAN promises simplified operation, agility for innovation, and new opportunities for monetizing network assets, it also brings new challenges for CSPs, such as:

- Quantifying the benefits, supported by a concrete business case.
- Understanding the use cases and their potential to generate new revenue.
- Understanding the best OSS and network evolution path and roadmap definition.
- Integrating legacy infrastructure with the new SDAN-enabled assets.
- Preparing for organizational and operational changes.
- Smoothing the process of migrating end users and services.
- Leveraging new services delivery capabilities brought by the cloud and SDN.

CSPs need support to move from PMO (present mode of operation) to FMO (future mode of operation) with clear business drivers, a cost-effective roadmap and a customized implementation plan.

The solution

Nokia has been working with leading operators worldwide to introduce new technologies by offering expert support. We have demonstrated that a proper technical consultation is the key to a successful implementation. SDAN has a profound impact on network operations in terms of both its breath and depth, which highlights the importance of an up-front analysis of key areas of SDAN introduction to achieve a comprehensive readiness assessment.

Nokia understands that CSPs may not have the resources for such an analysis as it requires special knowledge and experience. We have, therefore, channeled our learnings and expertise into a service package called SDAN starter-kit. The starter kit gives CSPs a structured approach for the SDAN introduction analysis that identifies gaps and issues before implementation.

What is it?

The SDAN starter-kit is an impact analysis executed by Nokia experts with a pre-defined model, delivered through face to face workshops leveraging Nokia's global expertise. It is a technical consultation service covering topics from strategy to tactics, validating the business case, providing additional proof-points, firming up investment plans (ROI) and helping define a roadmap fit for a CSP's individual situation and needs.

When does it happen?

The starter-kit service should be used during the planning phase, before considering vendor selection and/or moving into network implementation. Focusing on tactical level topics, the starter-kit is valuable for providing proof-points, or validation of the strategic level decisions and, therefore, closing the information loop between strategy and execution during multiple iterations of the planning process. In addition, CSPs can maximize the value of the service by feeding the impact analysis findings into the procurement process to ensure best business interests are met.

What does it deliver?

Firstly, the SDAN starter-kit helps CSPs make an informed decision when onboarding SDAN. TCO modeling helps CSPs to identify and quantify their specific operational benefits when implementing SDAN. The findings of the technical consultancy are summarized in an assessment report. By identifying potential gaps and issues, the report makes recommendations on the evolution path toward implementing a SDAN architecture.

As a next step, the starter-kit can look at what other Nokia SDAN services can complement to the customer in tackling various areas of the evolution path, such as design, OSS integration, intent development and migration services.

Customer stories

Here are two examples of SDAN starter-kit with focus on the TCO modelling in which Nokia helped two EMEA Tier 1 operators in achieving an improved understanding of the operational benefits of SDAN by comparing the operational cost of their traditional access network and with SDAN.

Scope

Quantitative OPEX analysis of the network operation using FCAPS (fault, configuration, accounting, performance and security management) as the main channels for the SDAN benefit comparison.

Approach

The analysis assumes the network running in a steady state, both in PMO and FMO. The benefits and quantifications are activity oriented so we can compare time and cost of FCAPS tasks performed in each scenario.

Method

30+ SDAN operational benefits have been identified across six operational areas: Network & IT Operations, Maintenance & Repair, Provisioning, Operational Network Planning, Deployment & Upgrades.

These elements are further consolidated into 12 OPEX categories. A walk-through of the current customer operations model helped to identify "formulas" for each of the 12 OPEX benefit categories.

The finalization of the TCO analysis was done through a workshop between CSPs and Nokia where the model was validated and the underlying data refined based on both CSP and Nokia perception.

Results

The analyses indicate that typical FCAPS fixed access savings for most operators will be between 25-40% after implementing a SDAN solution.

The analyses also indicate some categories have a higher influence in the overall TCO picture.

Figure 2: Operational benefits

Current operations   SDAN operations
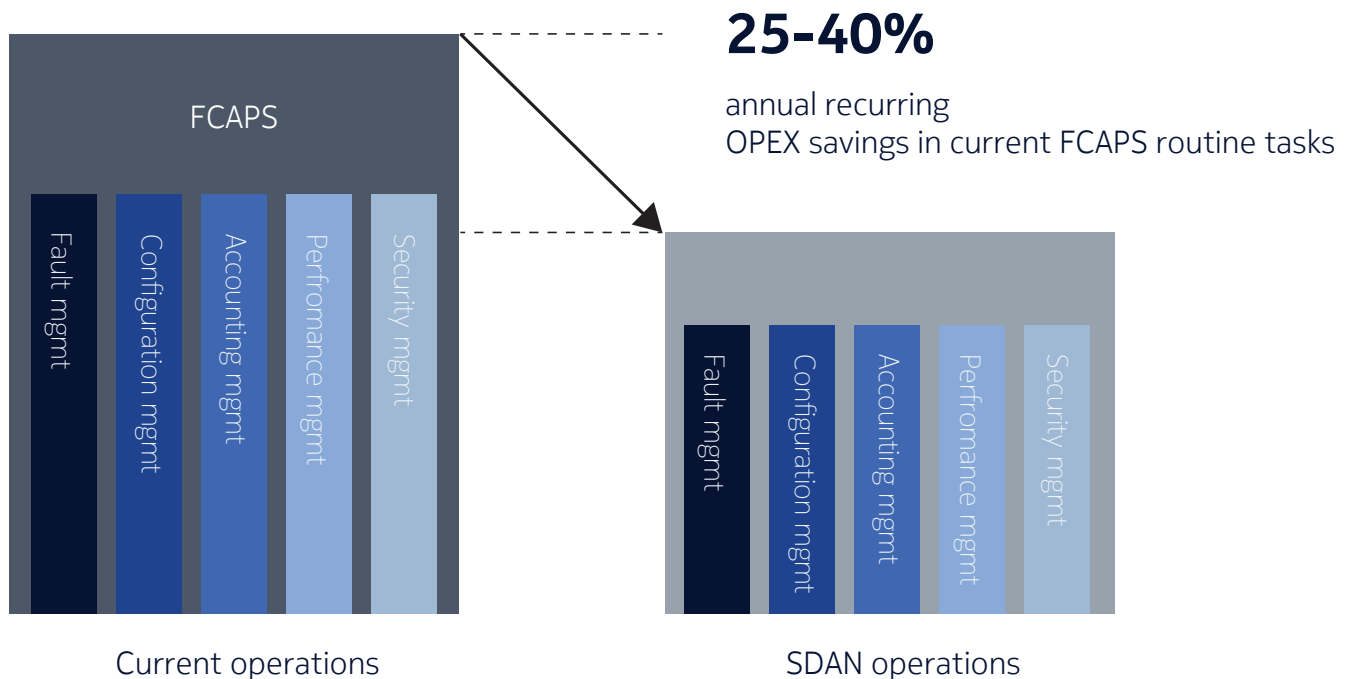
Every CSP's analysis will be different, given the maturity of operating models, the complexity of networks, the existing levels of automation in network operations, and other factors. This highlights the importance of a service such as the SDAN starter-kit to do a deep-dive into each CSP's situation and to make specific recommendations.

Value Proposition

Overall, the Nokia SDAN starter-kit provides a faster time to market by leveraging Nokia global expertise, structured approach and tools and experience from working with other customers on their SDAN transition. More specifically, CSPs will enjoy the following benefits:

1. Understand and quantify CSP specific SDAN operational benefits
2. Understand operational and network impact when introducing SDAN
3. Accelerate roadmap decision and evolution plan.
4. Optimized Return on Investment.
5. Flexible and agile engagement.

Conclusion

The move to SDN and the cloud is far from business as usual: it is the kind of access network transformation that only happens once every 20 years. Yet the benefits are significant and, most likely, essential for CSPs to remain competitive and profitable. Preparation is key and begins with the Nokia SDAN starter-kit to have the best possible understanding of the benefits of SDAN and be better prepared before implementing this industry game-changer.

Appendix

5G	Fifth generation mobile
API	Application programming interface
CSP	Communications service provider
DAA	Distributed access architecture
FCAPS	Fault, configuration, accounting, performance and security management
FMO	Future mode of operation
NFV	Network function virtualization
OPEX	Operational expenditure
PMO	Present mode of operation
ROI	Return on investment
SDAN	Software-defined access network
SDAN	Software-defined networking