



White Paper

A Common Network Management Solution – Transforming the OSS

Executive Summary

Over the years, as services have evolved, service provider networks have grown into highly complex islands of infrastructure from multiple vendors, each with its own management system. This complexity makes it hard for service providers to stay ahead in today's intensely competitive markets.

At the heart of the issue is the Operations Support System (OSS) that controls hundreds, if not thousands, of network elements.

Solving the challenge demands a complete redefinition of the OSS. Two of the industry's biggest players, Cisco and Nokia Siemens Networks, are collaborating to create an open network management platform that will enable all OSS application developers to add greater value for service providers through better network management.

The platform will make interoperability across the entire network a straightforward proposition. Service providers will benefit by being able to launch new services more quickly, with much lower deployment and operational costs. End-users will be able to enjoy exciting new services that are up-to-date, affordable and reliable.

Introduction

Service providers work in an increasingly complex environment. The world's communications networks continue to merge with the Internet. Consumers and businesses demand an ever-wider range of more advanced services, such as IPTV, video sharing and IP voice, built on multiple access technologies, such as WCDMA, HSPA, WiMAX and WLAN.

Service provider networks have grown into highly complex islands of infrastructure from multiple vendors, each with its own management system. Added to this mix are various systems from applications vendors, each of which demands training and updating of a service provider's internal skills simply to enable their use.

Complexity is making it harder and more costly for service providers to create, deploy, provision, monitor, control, troubleshoot and bill services effectively and quickly enough to stay ahead in today's intensely competitive markets. The situation will worsen as fixed-mobile convergence progresses and end-users increasingly demand tailored packages of services available anywhere, anytime and on whichever device they choose.

The Operations Support System (OSS) is how service providers manage their networks and the end-user services it provides. Controlling thousands, if not hundreds of thousands of network components, the OSS is the critical mechanism for turning network investments into revenue.

Yet nearly all OSSs are highly fragmented, built up piecemeal over the years by adding a variety of bespoke systems from vendors of all types to meet the needs of the moment. Most OSS applications have been built for a single purpose, inevitably creating a collection of inefficient stove-pipes of applications. These OSSs are a serious drag on service providers' efforts to roll out new network technologies and deploy end-user services quickly and cost-effectively.

Against this background, a fundamental question must now be asked: Is the current process of building, maintaining and operating OSSs sustainable in the coming years?



Cisco and Nokia Siemens Networks are two major players in the industry that have joined forces to collaborate on a project that will redefine the OSS. The aim is to solve the major problem facing service providers - that of the high cost and extreme complexity of OSS applications interacting with devices, which can consume as much as 35% of ISV development costs.

Pressures are intensifying, new thinking is vital

The pace of change in the global communications industry continues to quicken. The changes are not only intensifying existing pressures on service providers, but are also throwing up completely new challenges that will need innovative thinking to overcome.

The Internet is becoming ever more closely entwined with the world's telecommunications networks. New technologies and new competitive pressures are forcing service providers to rethink their roles as their customers look for new services and seek out the best deals matched to their needs.

To secure their future, service providers must solve several key issues as they search for improved efficiency in their operations and advanced services that will win lucrative new revenue streams.

- **Converging services and new technologies**
The buzz today is triple play and quadruple play – providing a converged set of services encompassing wireless and wireline telephony, Internet and TV.

The days of selling single, stand-alone services are numbered. Customers expect a set of fully integrated services tailored to their needs. They want these services to be available seamlessly whether they are at home, at work or on the move, and on the device they choose – mobile, PC, TV or handheld. Service providers able to offer converged packages will have a strong competitive advantage over those selling single, isolated services.

- **Rising complexity**
Service providers have to deal with a constant stream of new technologies that add complexity to their networks and management systems. Richer communications services will encompass a range of technologies, such as presence, location-based services, video and multimedia, and IPTV, set against a highly complex

landscape of network technologies implemented across multiple vendors' equipment, to a much extended range of end-user devices.

- **Faster pace of business**
The pace of technological development is accelerating relentlessly as the cycle of innovation becomes ever shorter. New devices and new services need to be exploited more quickly and brought to market in weeks, not months or years. Being first with a new service provides essential competitive advantage; lagging behind costs precious market share.
- **New forces of competition**
Cost pressures are increasing. New players are moving into the traditional telecoms space, raising the competitive stakes to new highs. Not only must service providers bring new services to market quickly, but they must do so more efficiently. Boosting their operational efficiency is vital for staying competitive and maintaining productivity.
- **Increasing compliance requirements**
In a world of tightening legislation and stricter compliance rules, service providers must be prepared to adopt best practices for network changes and security. In particular, large organizations and government agencies are becoming more concerned about monitoring changes to communications networks that they connect to. They are asking for greater visibility of such changes and service providers will need the tools to be able to check compliance as a matter of routine.

Redefining the OSS and its capabilities

Clearly, service providers must be able to create, provision, deploy, monitor, control, troubleshoot and bill all services accurately and efficiently. The Operations Support System (OSS) is vital in enabling service providers to create new services, launch and run them efficiently.

However, most existing OSS infrastructure is extremely complex and costly to maintain. For many service providers, OSS inflexibility hinders their growth. Instead, the OSS should help service providers to develop and deploy new services rapidly and cost-effectively.

Achieving this aim requires nothing short of a complete redefinition of the OSS and how it is structured. The basis of this redefinition as proposed

by Cisco and Nokia Siemens Networks is to structure the system into a customer-facing OSS and a network-facing OSS

The customer-facing OSS would include the business and service management layers. The network-facing OSS comprises parts of the service management layer, the network management layer and the element management layer.

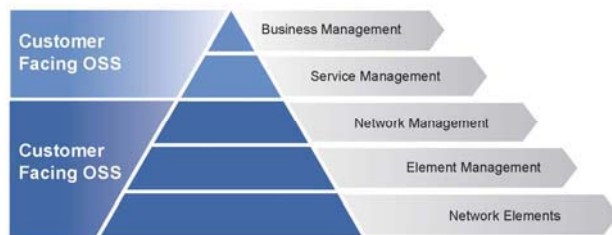


Figure 1: *Current OSS is a set of fragmented and static applications, generally requiring dramatic levels of human-intensive integration. The goal of the collaboration is to create a single model that can represent a fluid set of elements, networks, and services across those network. This can provide improvements in both the ability to deliver services more quickly and to lower the cost of operations.*

The key to the platform's success is defining the open interface between the customer-facing OSS and the network-facing OSS. Such an open, standards-based platform would solve many of the challenges that service providers increasingly face and enable the industry to more effectively deal with network changes.

One of the most important aspects of the platform is that it provides a common environment for all OSS applications, such as performance reporting, provisioning and service assurance. Most of these applications will come from third party vendors who will have access to open APIs and who will be able to focus more of their development resources on creating innovative and useful functionalities, rather than on the nuts and bolts of making an application work with network elements.

Towards a standard OSS

What is an OSS? A simple question you may think, but what should be a straightforward answer is made difficult by a lack of agreed, industry-wide definitions and standards.

The TeleManagement Forum's (TMF) Next Generation OSS (NGOSS) provides a set of specifications and guidelines for key business and technical areas, while its Enhanced Telecom Operations Map® eTOM initiative defines an overall telecoms operations map. However, there is no consistent definition of the OSS. Such is the complexity of OSS infrastructure today that a large number of standard interfaces need to be defined. The almost limitless combinations of these standard interfaces make it nearly impossible to standardize a full working OSS.

Current OSS infrastructure is disjointed

Most OSSs are highly complex back-end systems built up from disparate sets of point solutions from different vendors.

Today's services are largely built on separate solutions, often from different vendors and incorporating disparate technology and management systems. The OSS has been expanded section by section to meet each new service's needs and as the network has evolved.

The complexity that service providers face is illustrated by the case of a mid-size operator that has been in operation for about ten years. The operator estimates it currently has about 160 different systems within its OSS. Some have been created by its internal development work, some purchased from IT vendors and some from network vendors. Managing such a plethora of systems would be time-consuming and resource-consuming for any service provider. The piecemeal nature of many OSSs reflects the fragmented nature of the OSS industry as a whole. Several hundred vendors currently operate in the OSS industry, selling a wide range of products offering different approaches for the delivery of services. The diversity and non-standard nature of this multitude of point solutions will continue to cause headaches for service providers until a radical new approach is adopted. Service providers in the 21st century need a modern, more open and more integrated OSS if they are to tackle successfully the challenges they face.

Challenges facing service providers

The ability of communications service providers to efficiently operate, manage and control their networks



is fundamental to their entire business. The OSS is the key component that enables a service provider to turn its substantial network investments into viable business results.

Service providers must be able to integrate new technologies, new network elements, new services and even new capacity quickly and cost-effectively to win a competitive position in the market. Current OSSs in fixed and mobile networks are simply inadequate in helping service providers to achieve this aim. When new equipment is introduced or existing elements are upgraded, extensive work is needed simply to ensure compatibility with the existing OSS and Network Management System.

- **Service deployment is human intensive.**
Today, when new elements and devices are added to the network, a great deal of low level work is needed to hand-code the necessary interfaces. This work is difficult and time-consuming, adding no real value for the service providers' customers. Furthermore, as is typical with software development, custom coding is prone to errors and introduces unnecessary risks.
- **A fragmented OSS is costly to operate**
Many analysts that follow the OSS industry say that 50-70% of all spending on an OSS goes on systems integration and maintenance of legacy systems. A significant portion of this spending goes into training to ensure that a service provider's personnel are equipped with the know-how to use the various systems effectively. These costs can only rise as the demands on the OSS increase with the development and availability of new technologies and services.
- **Reliance on scarce resources**
Integration work is also specialized, leaving service providers dependant on costly and scarce programming personnel or being forced to rely on integration services. This situation is no longer viable and reducing the amount of integration work needed to deploy new elements and new services is needed to reduce costs and time-to-market.
- **Investment could be better spent elsewhere**
All of these issues add up to a significant drain on a service provider's resources that could be better spent on improving their business performance and meeting rising competition and technological complexity.

Modernizing the OSS is truly a make or break issue.

A platform to eliminate OSS fragmentation

The vision of a new platform that eliminates today's fragmentation is built on a network-facing OSS that provides developers with a common model that they can use to create applications to meet market demands. The platform is vendor-independent and works across all technologies.

Network modeling is the key

Typically, OSS standardization has focused on defining interfaces for collecting data for various network elements. However, data representation and modeling has not been properly addressed yet and this has resulted in diverse and inconsistent OSS architectures. Network modeling and data collection has been designed for each OSS system and application separately, reducing the interoperability of the OSSs significantly.

The key aspect of the network management platform is its ability to work with multiple technologies, collect data from various sources and represent that data in a meaningful manner. Network modeling provides visibility of the network topology, the services created on top of the networks and the status of the whole system. This is the most crucial aspect of the network management platform.

Applications will improve network management

Application development can then take place on top of this management platform. As such applications will use the consistent network models and data, they will more easily link together and inter-operate to provide a single, all-encompassing view of the network and services.

The OSS would then be built from a suite of applications capable of supporting all network types and architectures. The OSS would have full access to continuously updated information about the network's assets, its resources and the end-user services it provides.

The ability to develop applications that use the end-to-end network model fully will provide an important boost for application development, significantly improving service providers' ability to manage their networks. This will result in a business driver for all participants of the OSS industry to support a more flexible and profitable business approach. The consistent network model will also reduce the amount of systems integration work that is needed to deploy

the OSS, reducing lead-time and risks significantly.

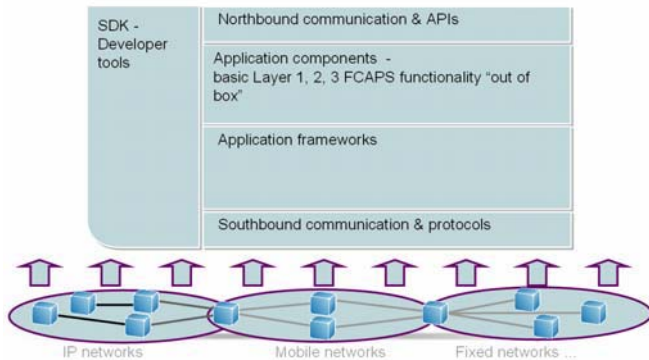


Figure 2: The intent of the collaboration is to create a next-generation OSS capable of managing multi-vendor, multi-technology, and multi-service networks. As customers accelerate their demand for NGN services, the OSS provides a framework for delivering, fulfilling, and ensuring services end-to-end. ISV's will take advantage of the common data and network models and find straightforward integration with well-defined API's.

The benefits of the common platform approach

A common network management platform would resolve most of the challenges that service providers face.

- Faster deployment of new services**
 By reducing substantially the lengthy integration process needed to ensure a new service or technology works with existing network management infrastructure, service providers avoid delays when adopting new network elements and services. Time-to-market is much reduced, enabling differentiation by being first to launch a service. Also, the payback time is short, helping to achieve faster returns on investments.
- Lower OPEX for end-user services**
 Improved network management capabilities will simplify the daily tasks associated with running end-user services. Not only will services become more reliable, helping to achieve higher end-user satisfaction, but fewer service provider resources will be needed to maintain the quality of service delivery.
- Enables new types of business model**
 As new business models are explored, the network management platform can offer the flexibility to deal with new complexities. For

example, the common network management platform would provide a means for 'wholesale' service providers that offer services to other providers, such as Mobile Virtual Network Operators (MVNO), to offer their customers a view into the network via the OSS. Network sharing between operators, in which infrastructure such as the Radio Access Network, is shared to reduce site CAPEX and OPEX, is another emerging business model that demands an OSS that can offer effective network management.

- Lower deployment costs**
 With a common network management platform, the integration of new services and technologies is greatly simplified. This means that not only are fewer resources needed for less time, but those resources can be less skilled and less costly. The overall cost of deployment is much reduced and device provisioning is more reliable, helping to achieve shorter payback time and greater return on investment.
- Lower OSS maintenance costs**
 Substantial cost savings can be made in network maintenance by using the platform's tools. This reduces the service provider's in-house development time and resources spent on incorporating changes and upgrading network elements and applications. Such cost savings translate directly into improved operational efficiency and higher profitability.
- Improved network management**
 An open network management platform will encourage a wider choice of OSS applications as developers adopt the platform structure. This will bring a new level of innovation and functionality, enabling service providers to more efficiently manage their network and add value to the end-user services they offer.
- More effective investments to improve OSS**
 The service provider resources released from managing the OSS can be re-applied to developing further OSS capabilities. In addition, the cost savings achieved through improved integration efficiency can be re-invested in additional and better applications to add value to the network. This investment will help the service provider provide more effective end-user services, vital to compete in intense markets.

Commitment to a solution



Cisco and Nokia Siemens Networks share a common vision and commitment to delivering an open, vendor-neutral, standards-based network management platform. To achieve this aim the two companies are entering into a multi-year agreement to bring together the best network management and operational support systems technology from the IP management and mobile environments.

The collaboration will help service providers to move from managing discrete islands of technology, to treating the network as a strategic asset for service delivery. Cisco and Nokia Siemens Networks believe they are well matched and that this initiative will benefit from their:

- established expertise in network evolution
- deep understanding of network complexity
- long-term commitment to network technology
- extensive R&D resources
- commitment to openness and industry standards

An important component of the initiative is to invite other vendors, application developers and service providers to participate. The aim is to create an ecosystem / developer community with the opportunity to build value on top of the solution. Transforming low value network element mediation and integration work into high value service-enabling activity should be one of the major values for the industry as a whole.

Ultimately, the key to the platform's success is to make interoperability across the entire network a straightforward proposition for service providers. Cisco and Nokia Siemens Networks believe that the network management platform will become the most widely used OSS platform.



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