

OSS

Redefining OSS
for business value in all-IP
Next Generation Networks

Management Summary

People now demand more from their phone companies. We don't just expect richer functionality and more choice - we want transparency and lower cost too. With the richer mix of communication, business and entertainment services, we all understand that the higher the bandwidth, the better our experience. And of course, we use an increasingly rich mixture of devices with smartphones, tablets, and interactive TVs all being part of our everyday lives.

And it's not just the customers who expect more: investors and financial markets also have raised expectations, demanding higher returns from their investments.

To benefit from these higher expectations, Communication Service Providers (CSPs) must both diversify their service portfolios and rationalize service delivery. They must achieve this under unprecedented competitive pressure - compressing time-to-market for new products, boosting all aspects of operational efficiency and achieving differentiating service quality in everything they do.

The shift to all-IP Next Generation Networks (NGN) promises much in terms of increased agility and reduced operational cost. But NGN alone cannot deliver the required advances. For most telecommunications companies, Operational Support Systems (OSS) still remain tightly coupled to technology silos.

This must change.

OSS needs to be dragged out of the technical back office and reexamined in terms of business contribution - specifically with regard to the overall quality of customer experience.

In this paper, Atos asks how OSS can make a more potent business contribution, and considers the implications for the associated IT architecture.

By breaking the OSS domain into its constituent parts, we can help CSPs focus on their individual business challenges, with real emphasis on operational agility. This examination, in turn, becomes an accelerator for success in the new world of Next Generation Networks.

Who should read this paper?

This white paper is intended for CSP professionals with a specific business or technical interest in operations and the processes and technologies which support them. This paper will be of particular interest to those needing to manage complex combinations of new and legacy networks, delivering their own and third party fixed and mobile services.

Table of Contents

Management Summary	2	The Atos OSS model in action	6
Who should read this paper?	2	The Quad-play bundle study case	6
Introduction	3	Service model and platform	6
NGN and the all-IP landscape	3	Dual views required	7
Four challenges for network operators	4	Fulfillment, service activation and policy control	8
Challenge 1: Separating services from the underlying access technology		The OSS shift: from technology to business	9
Challenge 2: Quality-of-Service and transport		Business Process Monitoring	9
Challenge 3: Mobility and ubiquitous service provision		The Service Catalogue	9
Challenge 4: Unrestricted access to different service providers		The Atos position	10
Establishing an understandable OSS model	4	Conclusion	10
Service Assurance	5	References	11
Fulfillment	5		
Mediation	5		
Workforce Management	5		
Network Planning and Rollout	5		
Asset Lifecycle Management	5		

Introduction

For CSPs, what were once highly differentiating offers have fast become the norm. These include quad-play offers, universal broadband internet access and delivery across an expanding array of smart devices. Just as the technological landscape has grown more diverse, so the range of parties involved in the service value chain has increased.

In this paper, we suggest a means to achieve the improvements in operational control needed in this new landscape. These improvements will also enable CSPs to proactively manage customer experience and compress time-to-market. All this is directly linked to the ability to master convergence in the increasingly diverse IP service environment.

Atos estimates that where legacy OSS landscapes dominate, around 70% of the cost of deploying new services results from the need to manage dependencies between order orchestration, network provisioning

and service activation. When you minimize these dependencies and standardize their process interfaces, you will radically improve time-to-market for new services, production quality and operational control. The sum of these improvements translates directly into the enhanced customer experience on which both loyalty and profitability ultimately depend.

Customer experience and production quality become the foundation of success for every CSP. It's easy to say, but tough to achieve: customer assurance for IP services is at least three times more complicated than that of traditional connectivity services. The converged service inventory becomes the critical foundation component for both customer assurance and for network and service operations. In parallel, mediation must now provide enhanced quality-of-service measurements, moving beyond the traditional technical focus of strict resource performance measurement.

NGN and the all-IP landscape



next generation
intelligent networks

The ITU NGN Definition

A Next Generation Network (NGN) is a packet-based network able to provide services including Telecommunication Services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It offers unrestricted access by users to different service providers. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.

(ITU-T Y.2001, 2004) ^[1]

As traditional CSP networks are transformed into all-IP Next Generation Networks, there must be a corresponding change in OSS. With those traditional networks, service delivery is tightly coupled to access technology. With circuit-switched telephony, for example, the physical resources used to deliver the service must be dedicated to the customer who uses it.

As CSPs have introduced services such as broadband internet and IP-TV, they have generally continued to build on this approach for OSS in fulfillment, assurance and inventory management processes.

Four challenges for network operators

Atos believes there are four underlying challenges facing network operators regarding OSS transformation for the all-IP and NGN landscape.

Challenge 1: Separating services from the underlying access technology

For fulfillment, the qualification processes used until now to determine available bandwidth before provisioning internet, VoIP or IP-TV services no longer apply. For customer assurance the resource inventory is no longer the root cause of a customer problem.

Challenge 2: Quality-of-Service and transport

Managing quality-of-service in the transport network now becomes critical. Delivering the required quality of customer experience now depends on transparency and understanding of the virtual circuits in the transport network and their associated QoS characteristics. This, in turn, impacts both assurance and capacity planning.

Challenge 3: Mobility and ubiquitous service provision

The relationship between service, customer equipment and access network is now dynamic.

Authentication can no longer be fulfillment-based but must be executed at the time of usage. Traditional approaches using root-cause-analysis and resource-based correlation are no longer adequate now that device and user-location are dynamic and must be determined on demand.

Challenge 4: Unrestricted access to different service providers

As CSP portfolios expand, new business models are needed in which the multiple parties involved in the service chain can collaborate. CSPs must find the means to integrate third parties into the value chain rapidly, safely and profitably.

Establishing an understandable OSS model

The reality of OSS has never been as neat as the name implies. In reality, OSS has been used as a convenient umbrella term for a disparate collection of systems and processes. For most CSPs, these have been developed over the years with only the loosest of structured co-ordination. In many ways, that was fine as long as the focus was on the delivery mechanism and not the service or the customer.

With the arrival of the all-IP NGN, we need to establish an OSS model which is more than a label of convenience. We do need to be able to examine the constituent parts of the model too: different CSPs have different priorities and challenges - and it must be possible to focus on those. It is, however, essential to be able to observe and assess OSS activities from end-to-end. Without this perspective, it is impossible to understand the interdependencies which underpin operational efficiency.

The model has four domains in all:

- ▶ Fulfillment
- ▶ Mediation
- ▶ Assurance
- ▶ Support processes

Each of these four domains has a distinct focus in the CSP value chain. Individual CSPs differ widely in terms of their resource, maturity and approach to each of these domains and specific operational areas.

By creating a standardized OSS architectural model, Atos helps establish a common framework for discussion, analysis and dialogue between technology and operations experts. It becomes the basis for the considered prioritization of those operational areas where most is to be gained from transformation.

The OSS model developed by Atos is strictly designed around four domains based on the level 1 process areas as defined by the TM Forum eTOM business process framework.

O

an integrated OSS model

Fulfillment

Fulfillment covers the provisioning and activation of services for both retail and business customers. You can see fulfillment acting as a bridge between BSS and OSS, interfacing between order capture and composition on the one hand, and service delivery on the other. CSPs can find fulfillment particularly challenging in their efforts to get new products and services to market faster than the competition. The best way of dealing with a large or complex problem is often to break it down into its constituent parts, and that is exactly what we propose with fulfillment, with the following three categories:

Network services

Fixed and mobile connectivity services, including broadband, TDM and mobile voice services are traditionally included here. This will change with the advent of FTTH and VoLTE.

Service inventory

Need to provide a 360 degree view of all services consumed by the individual customer. Services are defined according to the TMF SID model ^[1] and are seen as customer-facing services.

Value-added services

Services including IP-TV, VoIP, messaging, internet, cloud services including personal and business back-up and archival.

Mediation

Mediation has traditionally been considered a part of charging and billing. This now changes as its importance as customer experience management gains recognition. Output from VOIP and IMS session management layers, for example, can deliver service quality information about individual customers. When aggregated, this information becomes invaluable in proactively identifying resource and capacity problems across the delivery chain.

Assurance

Service assurance focuses primarily on trouble ticketing and fault and performance monitoring. You can consider service assurance from two perspectives:

Customer assurance

Here the focus is on the services used by the individual customer. The output is used either by customer service agents or by automated responses to customer complaints.

Service operations

The focus here is on the overall service delivery platform, used by thousands or even millions of customers. Output is used by the service operations center, and technical performance is measured against SLAs according to ITIL ^[2] standards and best practices

Support processes

Workforce management

The quality of the systems used to coordinate the activities of your field service engineers makes a direct contribution to both business efficiency and customer satisfaction. Whether responding to an incident or working on scheduled fulfillment activity, the productivity of the staff in the field depends on the OSS workforce management systems. These need to match skills and availability with time and location, ensuring that engineers have fingertip access to the documentation and diagnostics they need to do the job.

Asset lifecycle management

Your asset lifecycle management systems must establish an accurate, reliable and timely picture of current resources. They must interface with both finance and accounting processes to ensure, for example, that end-of-life and renewal activities are clearly anticipated and costed. Asset lifecycle management also has an essential role in effective future planning and in optimizing opportunities for redeployment. This functional area closely linked to the use of Configuration Management Databases as defined by ITIL, and has direct relevance for service operations.

Planning and rollout

Although network planning and rollout are often seen as marginal to OSS, the efficiency of this activity underpins the success of network fulfillment. Smooth transition into operations demands a well-ordered handover and planning and rollout systems must achieve this. As CSPs seek to pilot, test and deploy new broadband access technologies such as GPON and ADSL Bonding, dependence on planning and rollout services increases in importance. It is important to take into full consideration the need to coordinate activity and share information across extended teams of contractors and third party providers.

The Atos OSS model in action

The Atos OSS model is designed for practical application. It will ensure that CSPs are able to plan and craft a coordinated approach across all OSS functions. In addition, it will ensure that increasingly important interaction with the BSS is fully considered from the start. Together, these characteristics will ensure that OSS activity both satisfies the traditional need for expert technology management and at the same time helps introduce critical and differentiating business performance capabilities.

The study case included to illustrate these benefits examines the use of the Atos NG OSS model for a retail quad-play bundle. It shows how this approach reduces the complexity of service provisioning and operations. It also indicates how this new approach contributes directly to the improved management of customer experience.

The Quad-play bundle study case

This study takes the example of a typical retail quad-play bundle. The bundle is designed for family use and anticipates each family member using any combination of services from any device.



The bundle packages:

- ▶ Voice communication services
- ▶ Messaging and e-mail services
- ▶ IP-TV and internet access
- ▶ Online back-up

The family can access services using wireless or wire-line broadband access using smartphone, fixed line phone, tablet, interactive TV or PC.

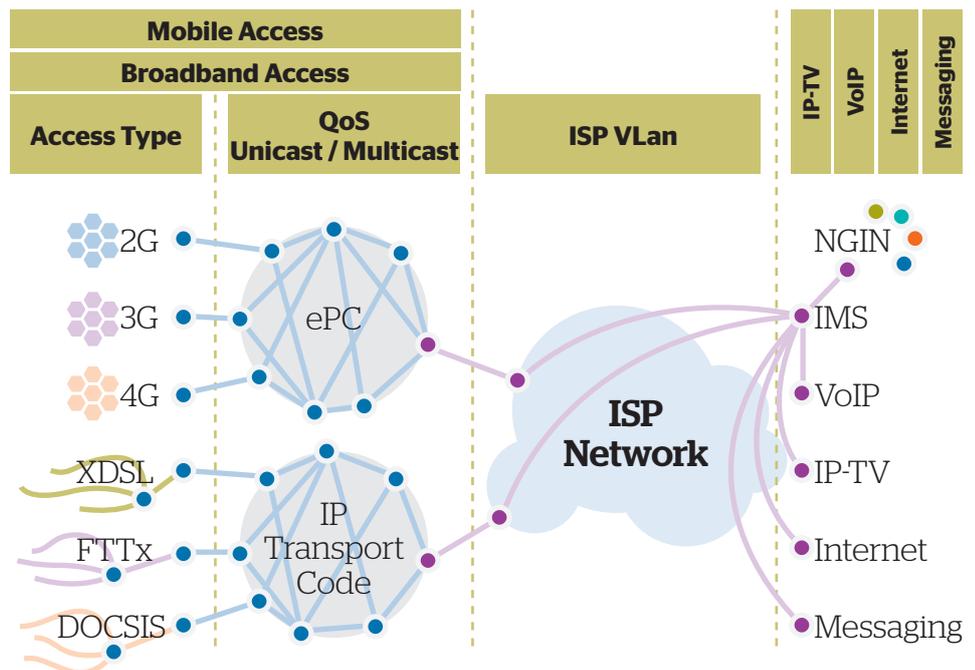
Service model and platform

The individual services that make up the quad-play bundle each have their own service delivery platform. These service delivery platforms are connected to the distribution network using virtual LANs. IP traffic from the service platforms is distributed to the access network via virtual circuits and prioritized according to QoS specifications.

The OSS service model establishes a logical view of individual components across the end-to-end delivery chain. It also provides the OSS building blocks used for fulfillment and assurance.

The figure shows how the OSS model encapsulates multiple service delivery technologies while maintaining a single view of the end-to-end delivery chain.

Centralized access control (AAA) across all service platforms, including broadband access, is provided by the IMS. The Atos Next Generation Intelligent Network (NGIN) manages interoperability between the IMS and fulfillment systems. It also provides the SIP trunking function needed to bridge the worlds of traditional TDM and VoIP.



Dual views required

With the quad-play bundle, assurance requires two views:

360 degree customer view: Showing all services used by the customer and all devices used to receive those services.

End-to-end service delivery view: Showing all technical components used to deliver any given service to the consumer.

The 360 degree customer view reflects the customer service profile once fulfillment or service activation is complete. As part of the service inventory, it catalogues all services to which the customer has subscribed. It provides the definitive record used in customer assurance processes. When a customer contacts a call center or uses a self-care interface, for example, this view acts as the entry point regarding all customer-facing services: mobile and broadband access, IP-TV, VoIP, internet and messaging.

Customer assurance is reactive and works top down to identify the root cause of any perceived problem. If, for example, the customer says 'my TV-Service is not working', initial diagnostics are used to obtain a more precise description of what is not working: is the whole service down or is the fault limited to this customer?

The problem may not be directly associated with the IP-TV platform but rather with one of the components in the end-to-end delivery chain. In this case, we need to know whether QoS for the virtual circuits is being met or whether capacity problems in the distribution network have created bottlenecks.

The problem could also be in the customer's home network, with cabling or with a router, for example. In these cases, you need the end-to-end view, represented in the service inventory in terms of the dependencies between customer-facing services.

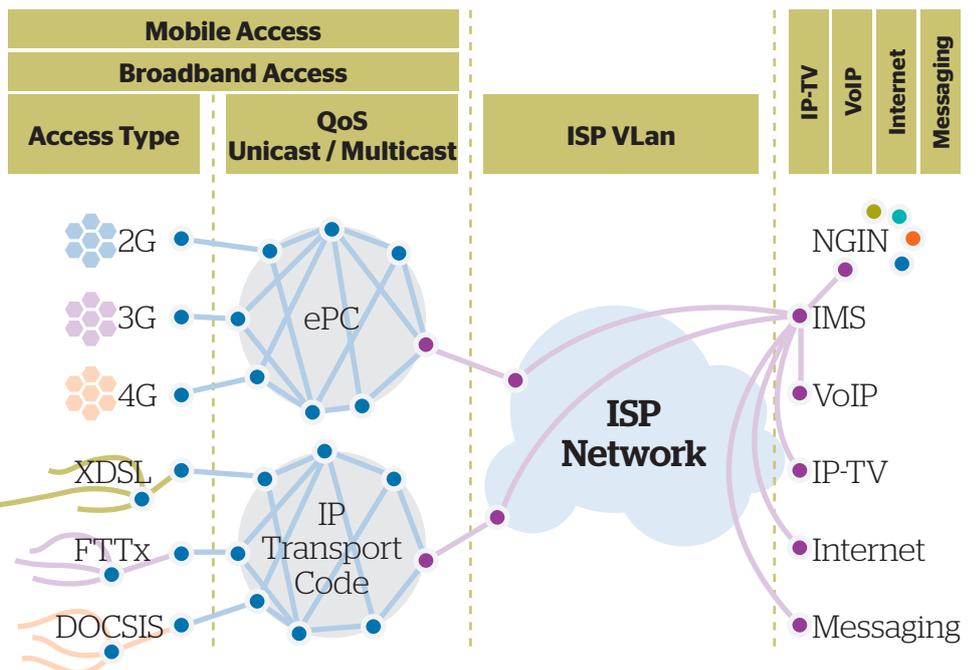
The end-to-end service delivery view uses proactive monitoring and is performed bottom

up. Alarm and performance monitoring tools provide detailed information on the technical condition of the service delivery platforms. This gives network or service operation teams the information they need to anticipate and resolve problems.

Information produced by fault and performance monitoring systems must be interpreted in terms of business impact:

- ▶ Is a critical service down?
- ▶ Is there a capacity problem?
- ▶ How many customers are directly impacted by the problem?
- ▶ Are any VIP customers impacted?

This information can also be used to support reactive customer assurance processes. You achieve this by ensuring that all dependencies between customer-facing services are correctly represented in the service inventory.



Fulfillment, service activation and policy control

The order fulfillment process typically needs to lock right in to network and service activation functions. When a customer wants to add functionality or change the composition of their quad-play bundle, for example, modifications need to be activated.

Much of the complexity of fulfillment is due to the need for accurate qualification: once the customer has made the request, the provider needs to be sure that there are no barriers to delivery. These may be concerned with legal and contract rules, such as age limits and credit-worthiness. They may also be concerned with technical and delivery capabilities: customers living outside 4G coverage, for example, should not be able to buy 4G services.

These technical dependencies play a critical role in the service assurance processes outlined in the previous section. In traditional CSP practice, fulfillment processes provide a static snapshot of the delivery chain taken a specific point in time.

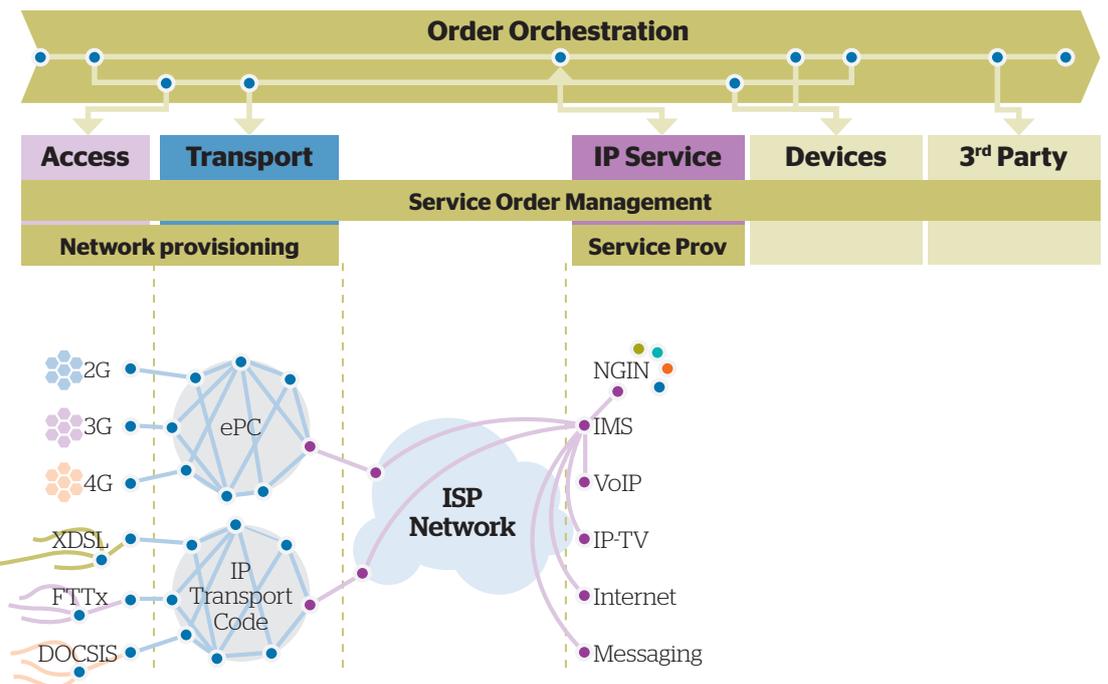
With the new all-IP paradigm, these static snapshots are no longer fit-for-purpose. With our quad-play bundle, for example, individual family members may want to change the service mix at any time - and this makes the relationship between the service and the access medium dynamic.

The policy control functions of access control and authentication must now take place as the service is being used, and must mirror both the platform and the end user device. Each service delivery platform in the quad-play bundle must perform its own access control and authentication every time the service is used.

With the new OSS model, the IMS provides an umbrella function which both coordinates multiple service delivery platforms and also offers a near real-time view of the end-to-end service delivery chain.

This new approach allows you to eliminate technical dependencies from qualification during fulfillment. By exploiting IMS and NGIN together, you are able to move from static snapshots to dynamic real-time views spanning the end-to-end delivery chain. These changes radically enhance assurance for the all-IP landscape, enabling you to manage service quality efficiently and proactively.

By encapsulating the APIs of individual service platforms through NGIN, you also ensure that your OSS operations are able to integrate third party services faster and with greater control than ever before.



The OSS shift: from technology to business

By adopting a comprehensive OSS model, you gain the opportunity to transform to advantage. As illustrated by the quad-play example described above, this change will allow you to move beyond the traditional siloed focus on technology to an OSS approach driven by genuine business enablement in the all-IP world.

The figure shows how in each of the model layers, we can make the OSS domain ready for the all-IP world. Across the process, API, service catalogue and control plane layers we can now define business KPIs. These will allow you to establish the practical metrics needed to measure and compare the business efficiency of the relevant business processes.

The new model does not, however, discard essential technical performance monitoring: for the core infrastructure platforms, the model continues to apply stringent technical SLAs.

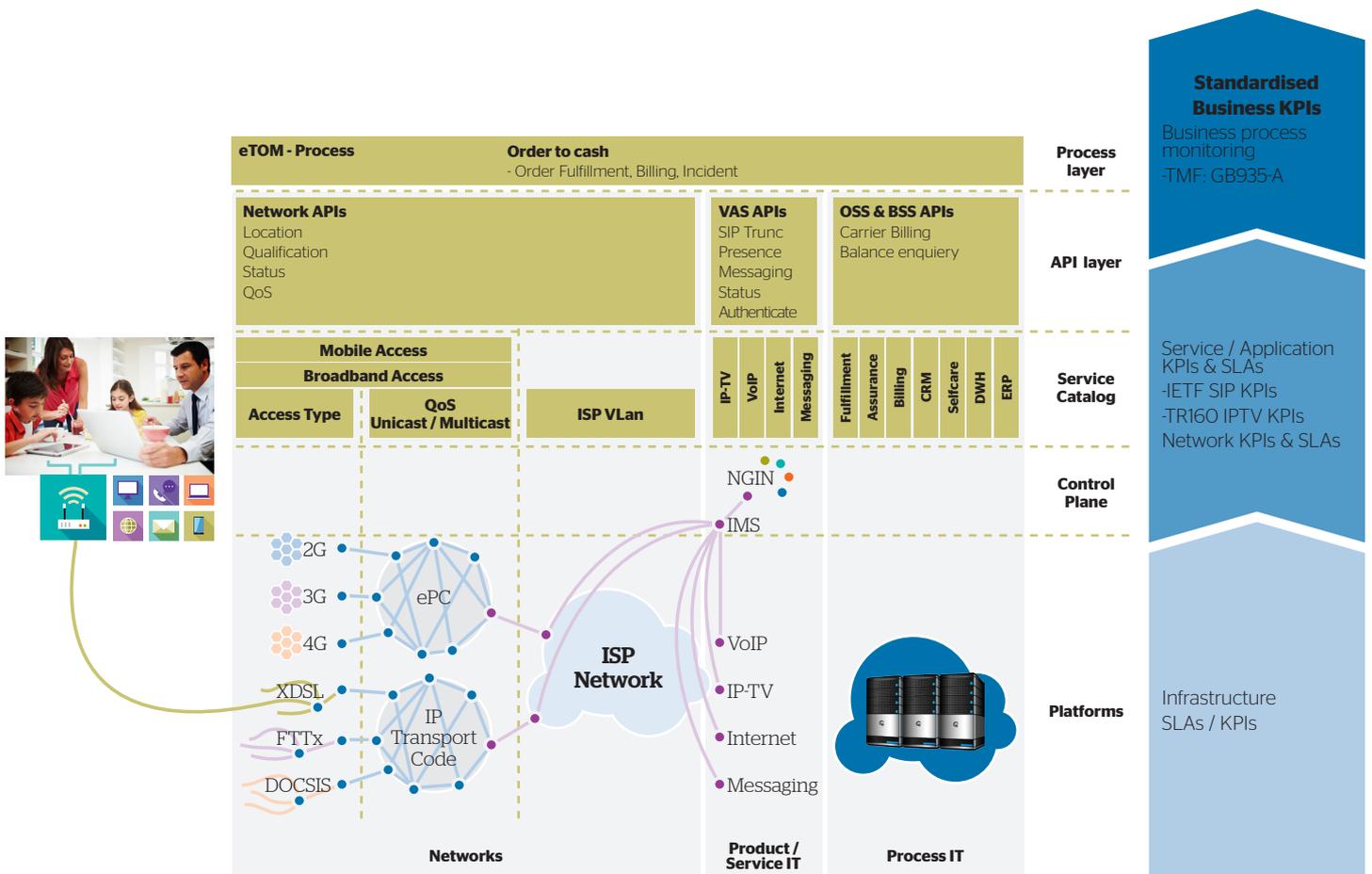
Business Process Monitoring

In the new model, business process monitoring focuses on order-to-cash processes. These include order fulfillment, incident resolution and billing. Now, for example, that OSS metrics can identify the order fallout rate for individual services, this intelligence becomes a valuable contribution to customer experience management. Atos uses the TM Forum G8935-A specification [4] as the business KPI baseline.

The Service Catalogue

A common service catalogue now provides an integrated view across all service delivery platforms. This covers networks, value-added services and process IT, and makes it possible to apply ITIL best practices across all service delivery domains. These newly defined service KPIs become the tools needed to manage operational quality and effectiveness. Service performance KPIs tend to remain technology-specific and industry forums such as ETSI [5] and the Broadband Forum [6] provide usable KPI reference sets.

The API layer, together with the service catalogue, provides a standardized set of building blocks on which business processes can now be based.



The Atos position

The current opportunities open to communication service providers through OSS transformation cannot be viewed simply in terms of system integration. Any CSP keen to explore the implications of OSS transformation must be prepared to look candidly at established processes. It becomes essential to ask how best to achieve the highest degree of industrialization across production processes.

Even more importantly, however, it requires you to acknowledge the shift in value from a static to dynamic understanding of the all-IP world. This applies both to the experience of your individual customers, and to the efficiency with which new and emerging process and technology can be turned to advantage.

As a company with deep knowledge of the processes and technologies which drive today's telecommunications, Atos can demonstrate expertise across many successful OSS transformation projects. With core strengths in system integration, we partner in OSS transformation projects while paying the attention needed to ensure essential continuity.

Conclusion

All-IP next generation networks are already set to become the established reality in telecommunications. Exploited intelligently, this shift will deliver unprecedented opportunities to achieve innovation and agility – and indeed to reduce operational costs.

This change, however, will not be possible without serious consideration of the role and management of Operational Support Systems. In the new world, the traditional technological and functional silos of OSS become a barrier to progress.

Fortunately the new OSS model provides an answer and a viable path to transformation:

- ▶ Fulfillment can now be simplified, decoupling access from service in the all-IP paradigm. AAA functions and QoS become real-time functions managed in the control plane.
- ▶ Assurance ceases to be based on a static snapshot captured at fulfillment, and becomes a dynamic real-time view delivered by the control plane systems.

- ▶ Shifting from technology silos to a converged service view makes it possible to establish both a 360 degree customer profile and an end-to-end service delivery view – an essential contribution for effective assurance.
- ▶ Establishing the service catalogue by using a system of well-defined APIs provides the means to increase agility, accelerate the integration of new services – and reduce the risks involved of onboarding new service partners.

Transformation is complex – but can be achieved with a holistic approach. By using a clear and structured OSS model, Atos is able to help you create and implement effective transformation.

Transformation can be intimidating, and in a climate of tight budget control, it is often tempting to put major projects on hold. In the case of OSS transformation, this is a high-risk approach. The all-IP landscape is fast becoming a reality, and without OSS functions designed to fit, it will be impossible to exploit the business potential of Next Generation Networks.

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About Atos

Atos SE (Societas Europaea) is an international information technology services company with 2013 annual revenue of €8.6 billion and over 76,000 employees in 52 countries. Serving a global client base, it delivers IT services in 3 domains, Consulting & Technology Services, Systems Integration and Managed Services & BPO, and transactional services through Worldline. With its deep technology expertise and industry knowledge, it works with clients across the following market sectors: Manufacturing, Retail & Services; Public sector, Healthcare & Transports; Financial Services; Telco, Media & Utilities.

Atos is focused on business technology that powers progress and helps organizations to create their firm of the future. It is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and is quoted on the NYSE Euronext Paris market. Atos operates under the brands Atos, Atos Consulting & Technology Services, Worldline and Atos Worldgrid.

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