Open Mobile Alliance
For a Connected World

Moving Towards 5G

Elizabeth Rose, Director of Communications of the Open Mobile Alliance (OMA) discusses the implications of next generation network architecture for standardization at the service layer

Elizabeth Rose, Director of Communications, Open Mobile Alliance (OMA)

With over 18 years of experience in the wireless industry at large technology companies such as Texas Instruments and Kyocera, as well as multiple technology start-ups, Elizabeth Rose currently serves as Communications Director at the Open Mobile Alliance where she oversees all communications activities. Ms. Rose holds a Masters Degree from the University of California, San Diego's School of Global Policy and Strategy.

International Standards Development Organizations (SDOs) such as ETSI, 3GPP, NGMN, GSMA and ITU have begun initial preparation work for the next generation mobile standard – 5G. While there is much debate as to the definition of 5G, it is widely agreed that this new network must provide improvements in capacity, deployment and operational costs and ecological impact.[1] Standardization efforts are already underway to enhance the core network, including Software Defined Networking (SDN) and Networks Functions Virtualization (NFV). However, detailed implementations are still in a state of flux with a proliferation of SDN controllers and even multiple orchestration platforms across diverse domains. This creates significant challenges for applications and service developers who must deal with a new Service Layer Architecture and multiple APIs that could complicate software development. While the effort to define and standardize network layer functions is beginning to take shape, it is also important that the mobile industry come together to define and standardize the services layer that will be deployed to allow operators to migrate legacy services and recoup their investment.

SDN/NFV Architecture Changes Everything

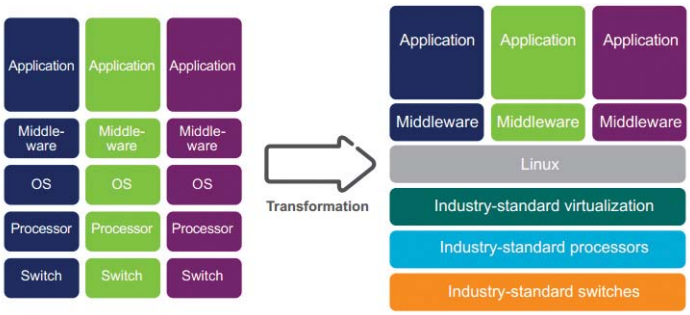
The SDN/NFV architecture has implications on the way services are deployed. The NFV 'Telco Cloud' architecture turns transport specific applications from vertical 'silos' into horizontal 'slices' where each solution is integrated with new NFV middleware so that it can operate transparently across any transport, Operating System (OS), or service platform on shared hardware.

This architecture for SDN/NFV enables operators to launch new combinations of services functionality very rapidly for both end user and network applications. Functional elements, referred to as Virtual Network Functions (VNFs) can deliver service capabilities across platforms, and functions can be mixed and matched to create new services on the fly.

Traditional applications – see left side of Figure 1 - leverage separate middleware and operating systems to request network resources. In NFV these applications will place requests to a Northbound Interface (NBI) API of the new SDN controller to access a shared operating system and virtualized network resources see right side of Figure 1 below. Unfortunately all the major telecommunications equipment vendors appear to be implementing different variations of this architecture with varying NBI API functionality.

Mobile ecosystem software players could find themselves with a new applications development environment and an enormous variety of new APIs for both open platform service enablement and legacy functionality. ►

Figure 1. NFV transforms vertical 'silos' to horizontal 'mix and match' services



Source: Ericsson: WAN Engineering Challenges of Distributed Cloud

This could seriously complicate the migration of current services to new networks, as well as slowing the rollout of new services.

Key Services through 2020

The Open Mobile Alliance (OMA) has focused consistently on standardization at the service layer - defined in functional terms with 'OMA Enablers' - to minimize the delay between the rollout of new network capabilities and the availability of standardized services. OMA continues to specify interfaces for multiple applications and services and to evaluate the impact of major trends on its members' services.

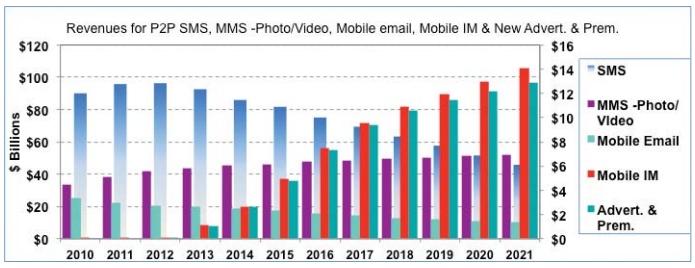
During the second half of 2014, OMA sponsored a survey of leading industry players to begin to define a vision for mobile services in 2020. The OMA survey found that in the next six years next generation network architectures will significantly impact both legacy mobile services and emerging ones.

Legacy Services

Going forward a number of existing services will expand - some significantly, others only a little. Current legacy services include 'native' mobile services – **Voice, HD Voice, Push to Talk (PTT), SMS, MMS, IMS and RCS-e joyn™ services** - along with 'walled garden' and other approved operator services for multiple vertical markets as well as former WAP Forum and SyncML™ applications. These services are referred to as 'legacy' however in 2020 these services are still projected to account for nearly US$85 billion in revenue. These services must be fully operational and interoperable over next generation networks as soon as the new architectures are launched, while achieving seamless backwards compatibility with today's 3G and 4G networks.

These services are referred to as 'legacy' however in 2020 they are still projected to account for nearly US$85 billion in revenue. To avoid revenue losses these legacy services must continue to be fully operational and interoperable across next generation networks while achieving seamless backwards compatibility with today's 3G and 4G networks.

Figure 2. Forecast of revenues from 'Legacy Services'



Source: Strategy Analytics Wireless Media Strategies June 2015

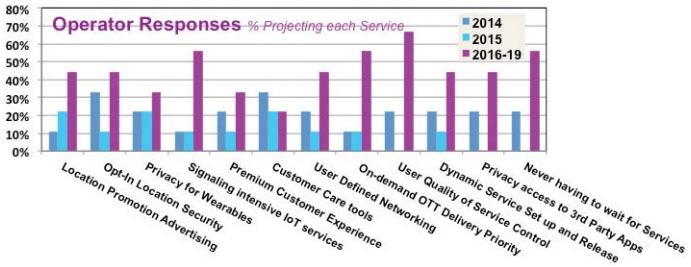
Emerging End User Services

Emerging Services include 'Over the Top' (OTT) and SIP based services that may be integrated with the above capabilities as well as the emerging plethora of mCommerce, Automotive, Location, and Internet of Things (IoT) services.

Service enablers that are inherent in SDN will create significant opportunities for new operator revenues, especially as SDN ultimately enables 'on demand' services to be assembled - or at least 'instantiated' from existing service logic - on the fly. These services represent the critical value added side of NFV/SDN. If operators are to afford the migration to 5G they must focus on lowering CAPEX and OPEX and target new services that improve margins and grow new revenue portfolios.

Figure 3 below describes a number of services identified by mobile operators through OMA's survey that are likely to be deployed by 2019. The percentages indicate the portion of respondents who predicted that a particular service would be commercially available in a given year.

Figure 3. Emerging Service Projections



Source: Strategy Analytics Survey for Open Mobile Alliance

Standardization of the Next Generation Service Layer

These emerging services will likely be dominated by agile development of technology and platform prototypes often in open-source, collaborative projects that put a premium on "code first." In the highly competitive world of application developers, where Open Source Software (OSS) is relied upon to produce the more than 1.3 million apps available on iOS alone[2], the procedures and output used to create legacy services can be seen as archaic and slow to market. Legacy services were standardized by SDOs, which provide the industry with a business and legal framework, ensure interoperability and backward compatibility, while helping to prevent industry overlap and fragmentation.

Clearly, SDOs play a fundamental role in defining our complex system of reliable, interoperable mobile voice / data networks and services across the planet, however the working styles of the standards communities and the developer communities are vastly different. The standards community has typically worked to define a solution for a relatively complex problem and to create a permanent solution that helps ensure integrity and interoperability at the network and applications service layers. Upon completion, SDOs have typically produced a document, often in PDF, published for the industry at large to absorb and adhere to when developing their products or services.

Application developers like to create applications that take advantage of these standards. But they also want to work with socially connected tools that allow for coopting, adapting, and republishing their work and the work of others. Performance of the network layer and even middleware - is taken for granted. The vitality of the entire mobile ecosystem demands that the standards development community and the application developer community bridge the gap in work practices and deliverables to ensure efficiency and interoperability across the mobile value chain.

So as the telecom industry begins to specify the services that will run over next generation networks, how can SDOs adapt to better enable application developers to take advantage of the standards they produce? Many individuals in the SDO community believe that standards development processes and the output of SDOs can and must evolve to meet the needs of the new mobile ecosystem including app developers. New initiatives from SDOs provide tools such as client/server emulators, editors to create profile data, GitHub code repositories, examples of how to use standards, sandbox servers for testing implementations, user communities and listings of open source projects based on standards.

As the mobile value chain evolves toward next generation network architectures and a business model emerges that includes the application developer community, SDOs must evolve to include them, as well. To do this, SDOs should provide the application developer community with tools that allow them to take advantage of the specifications they produce.

A mobile services ecosystem that incorporates the innovation and creativity common to developers with the safeguards and interoperability inherent in standards development brings benefit to the entire value chain. The telecom-related SDOs who will thrive as the next generation of networks and services are defined and deployed, will be those SDOs who embrace and address the real needs of the app. developer.

For more information please visit:
http://openmobilealliance.org/

1 Luis Jorge Romero, ETSI Director General; Connect World Europe
2 http://www.statista.com/statistics/263795/number-of-available-apps-in-the-apple-app-store/