TATA COMMUNICATIONS
TRANSFORMATION SERVICES

VOICE AND VIDEO DELIVERY IN THE 5G ERA

Is seamless voice and video service deployment possible by overcoming 4G/5G network challenges?

Business context

The recent 5G events and campaigns around the world have demonstrated that 5G is fundamentally changing the way communities and businesses communicate. Interactions using real-time communication services, such as voice and video over 5G, will be essential components of all 5G solutions. Under the 5G implementation framework, voice and video require careful end-to-end design and deployment.

The figure below shows some of the questions that telecom service providers may have during the 5G deployment process.

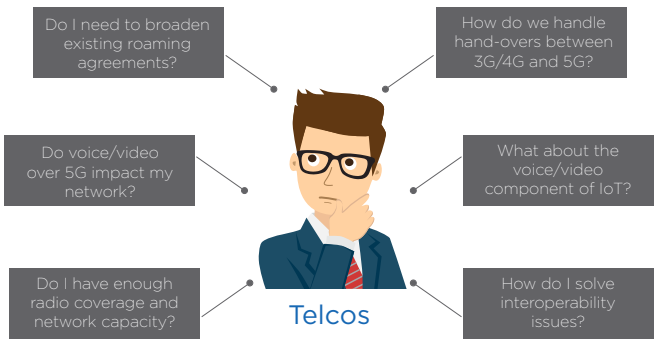

Figure 1: 5G design and deployment questions that need answers

The changing complexities in voice and video deployments

We know that voice and video services are undergoing a two-dimensional transformation. The first is in terms of the codec technology (HD, VHD and so on), and the second is with respect to the underlying infrastructure used to deploy the services.

There are many operators who have already deployed VoLTE over traditional network infrastructure, and they are facing a lot of challenges, including interoperability, roaming and service continuity. In addition, voice/video on an SDN/NFV environment pose a whole new set of reliability and performance challenges. Voice/video over 5G will further introduce new components, such as new access and core networks.

The figure below shows the high level of operator network complexities. These may be around for many years to come.

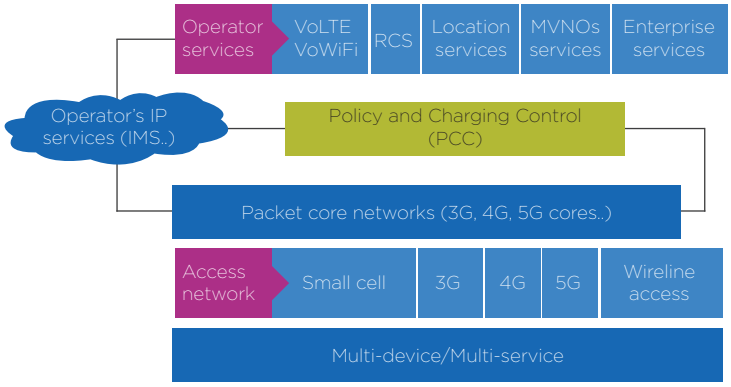

Figure 2: The current complex network architecture

Because of all these challenges, network operators must continuously evaluate, design and optimise all the layers of their network architecture to ensure high network performance (higher data rates and faster accessibility) and better quality of service to the end customer. Here are some of the challenges service providers need to address straightaway to successfully deploy voice/video over 4G/5G in an efficient and cost effective manner:

1. **Service continuity:** In this context, we are discussing the capability to conduct call handovers between different technologies without call drop. The present-day service provider networks are complex and contain a mix of 2G, 3G, 4G, small cells and now 5G components. As shown in the figure below, providing service continuity and preserving consistent voice/video quality during a call is one of the biggest challenges when moving to 5G. Especially in a HetNet (small-cells in different technologies and sizes) environment, service continuity will become even more complex if service providers do not manage these parameters at the early stages of design and planning.

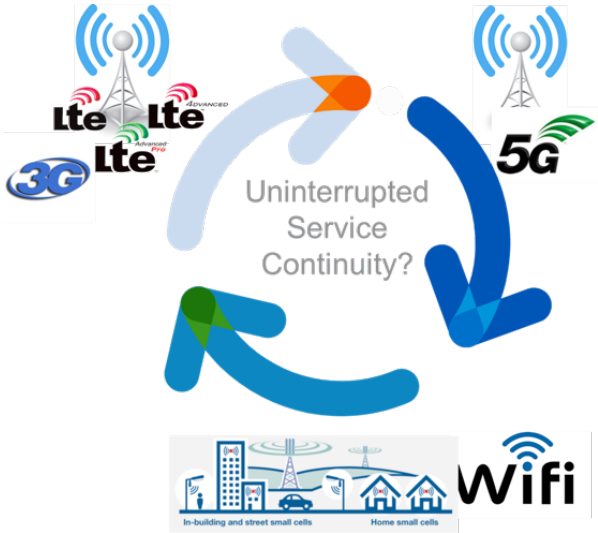

Figure 3: Real-time communications service continuity challenges in multi-technology environment

2. **Interoperability and roaming between service providers:** 3GPP and GSMA have outlined this in detail for VoLTE/ViLTE, but a practical implementation of this concept is yet to be seen for 4G and yet to be outlined for 5G. At present, we only know that VoLTE/ViLTE with QoS works effectively when it is within the same network.

3. **SDN/NFV:** This area is going to be tricky for a while and here are the major reasons why:
   a. **A common OEM-independent VNF infrastructure (MANO, automation, deployment tools and so on) needs to be created.** As there are many solutions in the market (e.g., OpenStack, VMware, OEM solutions), it is crucial for service providers to baseline an infrastructure that is cost effective and easy to maintain.

   b. **An end-to-end test strategy needs to be formulated.** End-to-end test cases (with respect to hypervisors/containers, vSwitches, VMs, VNFs and so on) must be created and tested in a lab environment.

   c. **Common testing tools are needed for development, testing, deployment and operation – and DevOps is to be followed.** Using the same tools minimises the risk of potential network failures. Service providers or operators are dependent on vendors for their applications and services. Meanwhile, vendors use their own set of tools and processes that are mostly inconsistent with the operators' tools and processes. Hence the operators' ability to acquire and develop the skills, tools and processes required for an efficient DevOps implementation stands to be questioned.

As shown in the figure below, operators need to adopt a holistic transformation approach, involving their organisation's culture and principles, to remove the barriers that currently exist between software/network developers and operations.

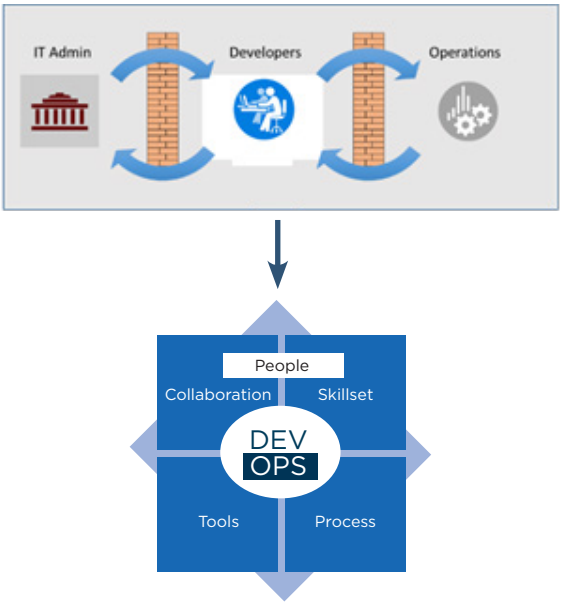

Figure 4: Design and operations organisational transformation

d. **Network reliability (includes geo-redundancy and disaster/failure recovery mechanisms) could be a challenge:** Providing uninterrupted service with close to 100% service accessibility and maintaining the reliability of a complex network, especially on an SDN/NFV environment, requires a lot of architectural evaluation and testing.

e. **Future IoT integration will impact conventional delivery:** As some of IoT applications require voice and video integration, service providers need to re-think whether and how these new service deployments will impact existing or traditional services, such as voice and video.

Experienced perspectives from a global telco transformation expert

Tata Communications Transformation Services (TCTS) has always highlighted the importance of people, processes and tools related transformation in the new, disruptive technological era. During our transformational projects for tier-1 operators across the globe, our experts have observed that a robust "People Strategy" – which is employee-focused and fully aligned to new processes and tools – will play a crucial role in an operator's 5G journey.

As we know, 2G, 3G and 4G will co-exist with 5G for many years to come. This will again pose new challenges on the operations and management fronts. The ability to balance new and legacy skill-sets will become more important than ever. Hence employees need to be encouraged to acquire new technology, process and tool related skills to be able to manage and operate both legacy and 5G networks efficiently.

TCTS is well-equipped to provide transformational services in the areas of planning and design, testing, implementation, management, and operations, helping service providers across the globe accelerate and de-risk their telco transformation journey. TCTS is committed to make these services widely available to operators to expedite their move to newer a technology spectrum and embrace the countless opportunities 5G brings to the table.

To learn more about our services, please visit www.tatacommunications-ts.com, or schedule a meeting with our experts by clicking here.

Abbreviations

IoT
The Internet of Things

MANO
Management and network orchestration

NFV
Network functions virtualisation

OEM
Original equipment manufacturer

QoS
Quality of Service

RAN
Radio access network

SDN
Software-defined networking

ViLTE
Video over Long-Term Evolution

VNF
Virtual network function

VoLTE
Voice over Long-Term Evolution

TATA COMMUNICATIONS
TRANSFORMATION SERVICES

Asfaw Negeri
Sr. Manager
Tata Communications Transformation Services (TCTS) North America

Asfaw Negeri is a Sr. Manager –Solutions Engineering at Tata Communications Transformation Services (TCTS) North America, which provides transformation services for network & business operations across telco lifecycle areas, as well as consultancy & business enablement services, to global enterprises and telecommunications companies. Asfaw has many years of experience in end-to-end wireless solutions design and deployment, strategic New Product Introduction (NPI) and business readiness planning and development. He has in the past worked for Ericsson, Sprint and WeDo Technologies.

About Tata Communications Transformation Services (TCTS)

Tata Communications Transformation Services Limited (TCTS), a 100% subsidiary of Tata Communications Ltd, provides leading business transformation, managed network operations, network outsourcing and consultancy services to telecom companies around the world. TCTS delivers operational efficiency, cost transformation and revenue acceleration solutions for all the stages of the carrier process life cycle, including but not limited tonetwork engineering and design, implementation and operations.

Email us
tcts.marketing@tatacommunications.com