Changing the landscape of the cellular backhaul market in Africa and beyond

As connectivity demands continue to reach unprecedented levels year on year, MNOs operating in Africa need to ensure they are ready to meet the demands of future. Semir Hassanaly from ST Engineering iDirect explains why satellite is the ideal solution to deploy this connectivity quickly and cost-effectively

The demand for data is exploding across the globe, and Mobile Network Operators (MNOs) are poised to become the primary way in which we connect. This is particularly the case as 5G comes to fruition, opening up new innovative use cases. To support this, and the tremendous surge in demand for data it will bring, MNOs will need the help of satellite and its inherent capabilities, especially in rural areas in continents such as Africa.

Satellite has the ability to enable cellular backhaul in even the most remote corners of Africa, which is historically underserved by connectivity. By combining the rapid drop in space segment prices with sophisticated and highly capable ground equipment, the cellular backhaul landscape in Africa is changing radically – and this is all at the hands of reliable, efficient satellite connectivity.

A solution in satellite

In continents such as Africa, access to high-speed, reliable broadband connectivity can significantly impact the quality of life and the economy. Connectivity has the power to stimulate socio-economic activity throughout the region, providing access to high demand applications, such as community Internet access and mobile backhaul. This includes public institutions which will also significantly benefit from dedicated services including education, healthcare and civil defense.

Satellite is the ideal solution to provide backbone connectivity to regions – such as Africa - that have no access to a fiber or undersea cable infrastructure, or when the backbone link needs to cross regions that cannot be secured. Furthermore, it is also the fastest method to recover from a loss of connectivity due to a cable failure or natural disaster. Therefore, in underserved areas of Africa, satellite has the ability to bridge digital divides and in some cases, fill Universal Service Obligations (USOs).

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In Sub-Saharan Africa, there has been a significant growth of mobile phone usage over the past few years. According to a recent report by the GSMA, it is currently the fastest growing region in terms of smartphone usage, with a CAGR of 4.6% and an additional 167 million subscribers over the period to 2025. This will take the total subscriber base to just over 600 million, representing around half the population.

As a result, we are seeing more demand for satellite-based cellular backhaul in Africa and we see this as a major area for growth in the future.

Opening up new opportunities

Across the globe, satellite is attracting significantly large deployments and is considered a very flexible and capable solution in the backhaul technologies mix. As a result, new use cases are being opened up for satellite backhaul. From offloading traffic in congested areas, postponing or avoiding ground network upgrades to sporadic use cases like railroads or sporting events; even first-responder networks requiring ubiquitous and reliable coverage are becoming profitable applications for the satellite industry.

While satellite backhaul may sound very promising for the industry, it is very much still in its infancy – with half of the world's population still not connected to the internet. However, the opportunity for expansion of the number of sites – particularly in continents such as Africa - that could be economically served using satellite backhaul from current levels of coverage is huge, totaling 507K new broadband base stations.

Cellular backhaul

Satellite backhaul not only provides reliability and quick service roll-out, it also brings increased latency and operational costs which must be mitigated with the right solutions.

When it comes to this, MNOs are looking for a reliable solution which can provide enhanced Quality of Service (QoS) and Quality of Experience (QoE) to easily extend connectivity to rural sites and integrate seamlessly within their terrestrial network. They are also looking for multiservice capabilities, which allow access to multiple market verticals to increase revenue, and scalable solutions for large point-to-multipoint networks and for demanding high-speed trunks.

And cellular backhaul over satellite is proving to be the best in efficiency, scalability and flexibility to bridge the digital divide in Africa and satisfy this growing demand.

Joining forces

Newtec and ST Engineering iDirect – who are both specialists in the designing, developing and manufacturing of equipment and technologies for satellite communications - have recently joined forces to combine Newtec's innovations in performance and efficiency with iDirect's innovations in networking and mobility.

The company's Dialog® platform, which is a single-service and multiservice VSAT solution provides a solution which can enable operators and service providers to build and adapt their infrastructure and satellite networking according to business or missions at hand.

Dialog also provides revolutionary Mx-DMA® technology, which can combine the benefits of SCPC and TDMA, ensuring that all the traffic is accommodated at each remote base station while multiplexing the bandwidth very efficiently between these remotes to decrease the backhaul operating costs. Additionally, Dialog is designed to overcome challenges in cellular backhaul connectivity, such as layer 2 and layer 3 bridging, as well as to provide mobility support, which is proving to be a critical area of our work.

Dialog and Mx-DMA have been successfully deployed commercially for mobile networks in Asia, Africa and Latin America and is currently empowering one of the world's highest capacity mobile backhaul over satellite projects. There are currently more than 20 mobile backhaul networks deployed over Dialog in the world.

In particular, Dialog was successfully installed for Mattel, Mauritania's leading mobile operator to provide cellular backhaul to several remote sites across the region.

Hybrid approach

However, bridging the digital divide in the outmost rural corners of Africa requires more than technology. A continued partnership between satellite and MNOs is also key and can create opportunities for both and can change the landscape of the cellular connectivity market for the better. With satellite in their network mix, MNOs have more room to extend the reach of their service and address new use cases, such as traffic offload for congested urban networks, Over-the-Top (OTT) content distribution, and critical connectivity for disaster response efforts.

High Throughput Satellites (HTS) and ground equipment with the ability to support hundreds of Mbps of capacity for backhaul, along with attractive price points, will also be crucial in enabling service providers, telcos and MNOs to not only "connect the unconnected" but also bridge the bandwidth gap between urban and unserved and underserved areas across Africa.

This is particularly crucial as we enter the next stage of the evolution for MNOs - 5G, which calls for a total integration of satellite connectivity with the 5G network model. In fact, NSR estimates that 5G-differentiated applications — such as 5G backhaul and hybrid networks — will generate close to one-third of net satellite capacity revenue growth in backhaul over the next 10 years. This is due, in part, to the fact that 5G backhaul capacity demand will consume four to five times the bandwidth of a 4G site, according to NSR.

Looking ahead

Cellular backhaul over satellite has a rich history in enabling MNOs to expand their service to remote and rural markets, particularly in Africa. From an initial 2G voice solution to a 4G/LTE data solution, the role of satellite connectivity has changed along with the profile of the mobile end-user – and we have no doubt that this will remain, as mobile usage across Africa continues to explode and 5G networks begin to be rolled-out across the globe. ■

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