REIMAGINE 5G NETWORKS

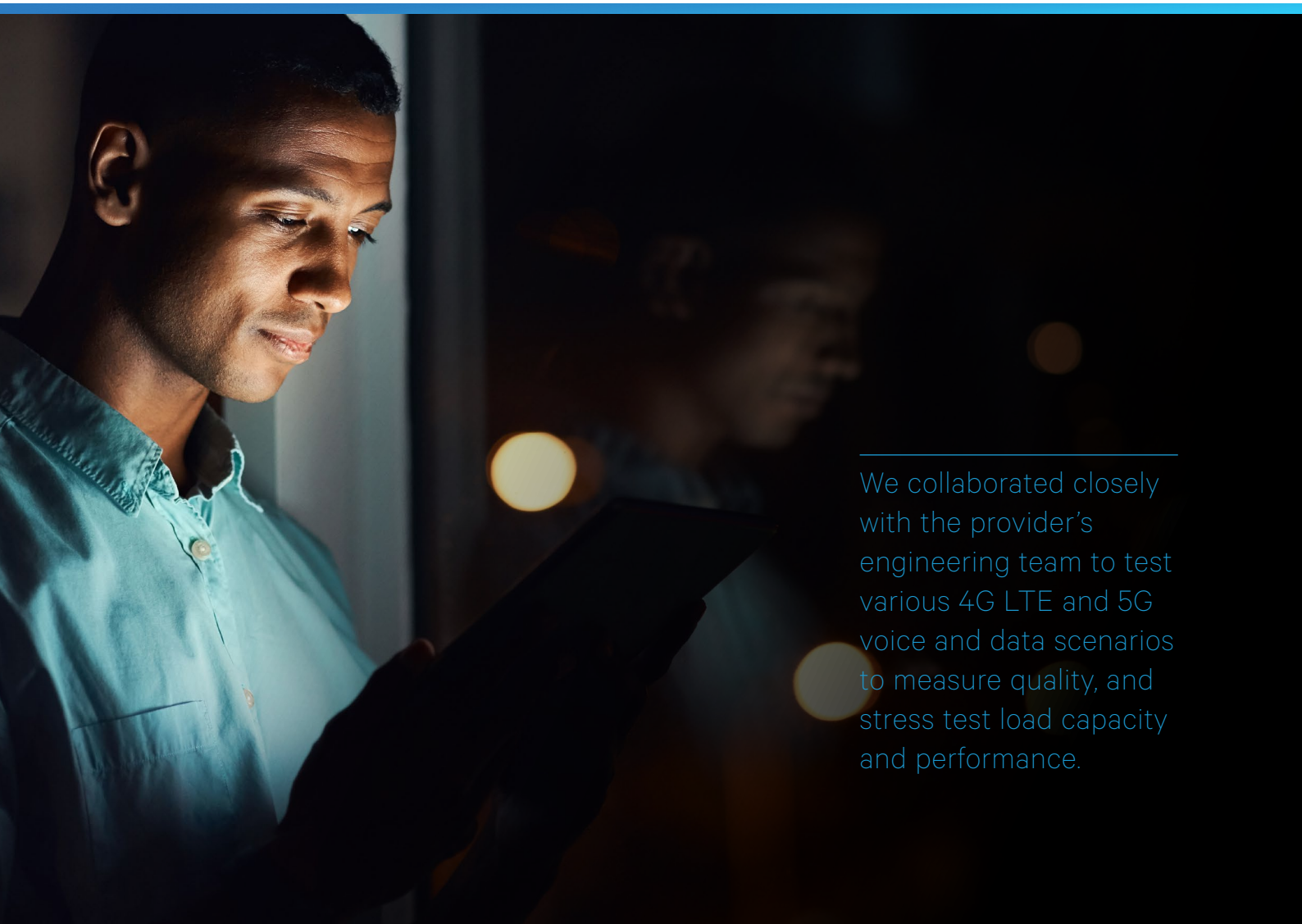
TECHNOLOGY SHOWCASE

Application
Mobile Networks

SES

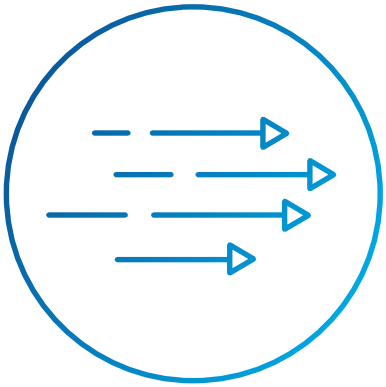
Together with one of the world's leading 5G mobile network operators (MNO), we conducted a week-long mobile backhaul test that proves our O3b medium Earth orbit (MEO) constellation's ability to deliver seamless 5G experiences via satellite.

With its proven high-throughput and low-latency performance, and ability to easily integrate with terrestrial networks, our O3b MEO constellation is used across the globe to provide reliable 4G LTE connectivity. These capabilities earned SES an invitation from a leading MNO and 5G provider to take part in a week-long test. The provider has used both our geostationary Earth orbit (GEO) and MEO links to provide backhaul, and wanted to determine how our non-geostationary satellite orbit (NGSO) constellation could be part of its 5G network expansion to rural and remote regions.



We collaborated closely with the provider's engineering team to test various 4G LTE and 5G voice and data scenarios to measure quality, and stress test load capacity and performance.

FUTURE READY



For MNOs, ensuring mobile backhaul solutions are 5G-ready is critical to meeting subscribers' evolving connectivity demands. By 2025, 5G will account for 20% of global connections. In this same time period, MNOs will have invested USD 1.1 trillion in CapEx—roughly 80% of which will be in 5G networks.[1]

MNOs are concerned about their ability to extend 5G networks to untapped markets. To deliver 5G to areas unreachable or under-served by terrestrial connections, they need a high-throughput backhaul link capable of delivering high-speed traffic to the edge of their network. At the same time, they need a backhaul solution that can rapidly restore connectivity in the event of a fibre outage. This is particularly crucial at aggregation points or switch sites that connect large groups of customers in more densely populated areas.

While satellite has long been used for mobile backhaul and emergency restoration services, GEO connections do not provide the throughput needed for 5G services. As a result, NGSO constellations will play a key role in the rollout of 5G networks.

1 "The Mobile Economy, 2020," GSMA, 2020.

TESTING OUR CAPABILITIES

10,000
simultaneous calls

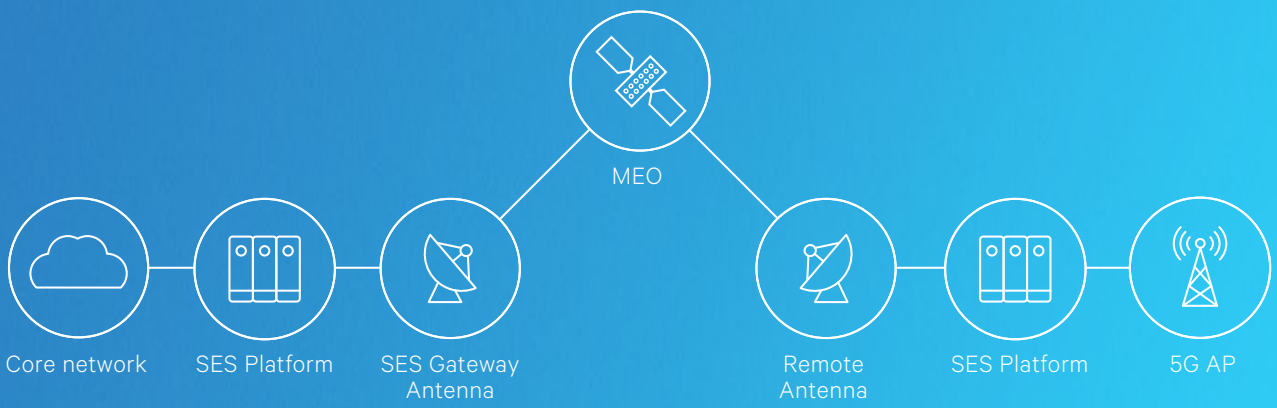
900 Mbps
aggregate throughput

0.1 ms jitter

To conduct the test, our dedicated team set up a 2.4m AvL mobile terminal on the roof of the MNO's facility. We collaborated closely with the provider's engineering team to test various 4G LTE and 5G voice and data scenarios to measure quality, and stress test load capacity and performance. With 900Mbps of aggregate throughput provided by O3b MEO, our team maintained 10,000 simultaneous data calls over a 10-hour period. In addition to demonstrating a fibre-like Quality of Experience (QoE) over video calls, testing showed a mean opinion score (MOS) of 4.23, 0.009% packet loss, and very low jitter of 0.1ms.

To fully test our O3b MEO constellation's ability to deliver 5G experiences, our teams initiated the industry's first pure 5G video call over an NGSO satellite by connecting two 5G handsets across 5G ultra-wideband base stations. During the test, device users waved their arms and jumped up and down to try to degrade the audio and video quality. To the surprise and delight of the MNO's engineers, our O3b MEO constellation delivered a fibre-like QoE throughout the duration of the call—with no perceivable lags or delays caused by waving the devices around.

Delivering 5G services via satellite



IMPROVING CUSTOMER EXPERIENCES

Taking a collaborative approach to this test underscores how our partnership will benefit end consumers—improving the performance, reach, and reliability of 5G networks by leveraging satellites to push new boundaries. Going forward, we will continue to work together to accelerate emergency response via deployable trucks, as well as using MEO to provide back-up connectivity for restoration of major cell hub sites.

After a week of extensive testing, SES proved that our O3b MEO constellation is ready to help MNOs easily and cost-efficiently extend 5G networks into new markets. Launching in 2021, our next-generation O3b mPOWER communications system will provide a tenfold increase in capacity to enable seamless backhaul from the edge and core. With uncontended multi-gigabit scalability and the flexibility to dynamically allocate bandwidth over steerable beams, MNOs can meet real-time demand at each cell site, without stranded capacity. The system will also support faster terminal installation and deployment times, as well as zero-touch provisioning to automate service delivery, which is critical for emergency response.

For more information on our 5G-ready services, please visit ses.com

SES HEADQUARTERS

Château de Betzdorf
L-6815 Betzdorf
Luxembourg

Published in August 2021.

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