Photo courtesy of Gilat Satellite Networks

Satellite-based cellular backhaul is going mainstream

Cellular backhaul has, in recent years, been identified as one of the fastest-growing satellite application sectors, prompting satellite operators and service providers everywhere to expand their awareness and capabilities in these areas. Doreet Oren, Director of Product Marketing & Corporate Communications at Gilat Satellite Networks, reports on recent cellular backhaul projects.

Until recently, mobile network operators (MNOs) were reluctant to deploy satellite-based cellular backhaul solutions if they didn't absolutely have to - mainly due to high costs and bandwidth limitations. As a result, the satellite option was used only for hard-to-reach areas such as islands, mountains and deserts, where terrestrial infrastructure (e.g., fibre or microwave) was either unfeasible or prohibitively expensive.

The emergence of high throughput satellites (HTS) and technological breakthroughs has irreversibly changed this paradigm. As satellite capacity continues to grow and bandwidth costs ($/Mbps/month) continue to drop, MNOs are taking advantage of satellite backhaul to support new types of use cases, beyond remote connectivity. These include metro-edge coverage extension, urban network densification, roads and highway coverage, emergency response and backup.

The abundance of HTS capacity, together with technological advancements in ground segment equipment, are driving adoption of satellite-based cellular backhaul for a wide diversity of 3G and LTE applications. In a recent report, research firm NSR singled out cellular backhaul as the key vertical expected to propel growth in the satellite communications market. To alleviate MNOs' concerns related to the complexity of satellite technology, NSR further noted the value of delivering full turnkey projects for satellite backhaul. Gilat offers such an option, including a comprehensive set of managed services.

Based on Gilat's numerous deployments at leading MNOs worldwide, it is safe to say that cellular backhaul is transitioning from a primarily terrestrial solution to a solution that integrates satellite backhaul as a strategic component of the network.

The following examples demonstrate the economic and

technological viability of satellite backhaul across a number of different use cases with leading MNOs from Japan, Philippines, UK and US.

Remote region connectivity in Japan

Softbank, a Tier-1 operator in Japan, deployed an LTE network over small cells in underserved areas where it is difficult to install terrestrial infrastructure and macro cell base stations. To meet the needs of residents and tourists in these remote regions, such as islands and vacation resorts, Softbank required satellite backhaul support for high-speed LTE services, as well as for providing network backup capacity and connectivity for first responders in emergencies.

Ensuring high-performance and a good user experience are of particular concern for LTE network operators like Softbank, due to the need to overcome the inherent delay in satellite networks. To address this challenge, Gilat developed a breakthrough acceleration technology which was jointly patented with Softbank. Now fully implemented in Gilat's VSAT system, this technology enables a true LTE user experience by accelerating the high bandwidth application traffic inside the LTE GTP tunnel. Gilat's satellite backhaul solution has enabled Softbank to offer high-speed LTE services in remote areas, with high availability and high performance on a par with terrestrial networks.

Network resilience and backup in the UK

Everything Everywhere (EE), part of the BT Group and an operator of one of Europe's largest 4G networks, has deployed Gilat's satellite backhaul solution to both enhance its network resilience and backup capabilities, as well as to extend its LTE network throughout the UK.

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To support this use case, EE uses both fixed and portable cell sites. EE's portable on-the-pause deployment is done via a vehicle-mounted solution containing both the cell node and the Gilat VSAT that handles the backhaul over satellite.

This portable, quick-to-deploy solution enables network resilience in the event of a cell site failure, as well as providing immediate high-speed voice and data connectivity to emergency response teams in the field. Gilat's VSAT delivers true LTE speeds to the handset and fully supports encrypted data.

In addition to network resilience, EE is using Gilat's proven satellite backhaul solution to extend LTE network coverage to over 95 percent of the UK landmass by 2020 (currently covers 90 percent). With over 30 million subscribers, EE runs

Photo courtesy of Gilat Satellite Networks

the UK's largest and most advanced mobile network, and was ranked by RootMetrics as the UK's fastest and most reliable LTE (4G) network.

Managed services business model in Asia

When it comes to deploying and managing satellite backhaul, some MNOs prefer to outsource the entire operation, so they can focus efforts and resources on their core mobile network, while leaving the intricacies of satellite backhaul to satellite experts.

As an example, Gilat has delivered such an end-to-end managed services solution to Globe Telecom, the leading full-service telecommunications company in the Philippines. Based on this business model, Gilat takes full responsibility for providing data and voice services over 2G/3G/4G to regions requiring improved connectivity and broadband access, in compliance with a strict SLA.

Gilat provides Globe Telecom with a set of managed services for satellite backhaul including the satellite capacity, network setup, 24x7 network operations (hub and remote sites), equipment installation and service management. Globe defines the SLA and KPIs and Gilat provides all the services and resources necessary to ensure smooth and cost-effective backhaul operations.

Photo courtesy of Gilat Satellite Networks

"Metro edge connectivity is a new type of use case that illustrates the applicability and effectiveness of satellite backhaul in non-rural/remote areas, such as metro edge, where suburban areas are often sparsely populated and lack mobile coverage."

Metro edge connectivity in the United States

Metro edge connectivity is a new type of use case that illustrates the applicability and effectiveness of satellite backhaul in non-rural/remote areas, such as metro edge, where suburban areas are often sparsely populated and lack mobile coverage.

Working with Gilat, Tier-1 providers Sprint and T-Mobile were among the first to bring satellite technology up to the metro edge. To enhance their competitive position and grow their customer base, each of these MNOs decided to extend its nationwide LTE network to underserved markets. The companies are using Gilat's satellite-based cellular backhaul solution to deliver high-speed LTE voice and data services to areas that previously had limited 2G/3G service.

Requiring only hours to deploy per site, Gilat's solution enabled Sprint and T-Mobile to expand their networks to new areas with very fast time-to-market and lower TCO than terrestrial solutions. This was instrumental in allowing the MNOs to gain new LTE subscribers in underserved areas ahead of the competition. Using Gilat's patented acceleration technology, subscribers enjoy true LTE performance over satellite with an outstanding user experience.

Nationwide LTE coverage and emergency response in Japan

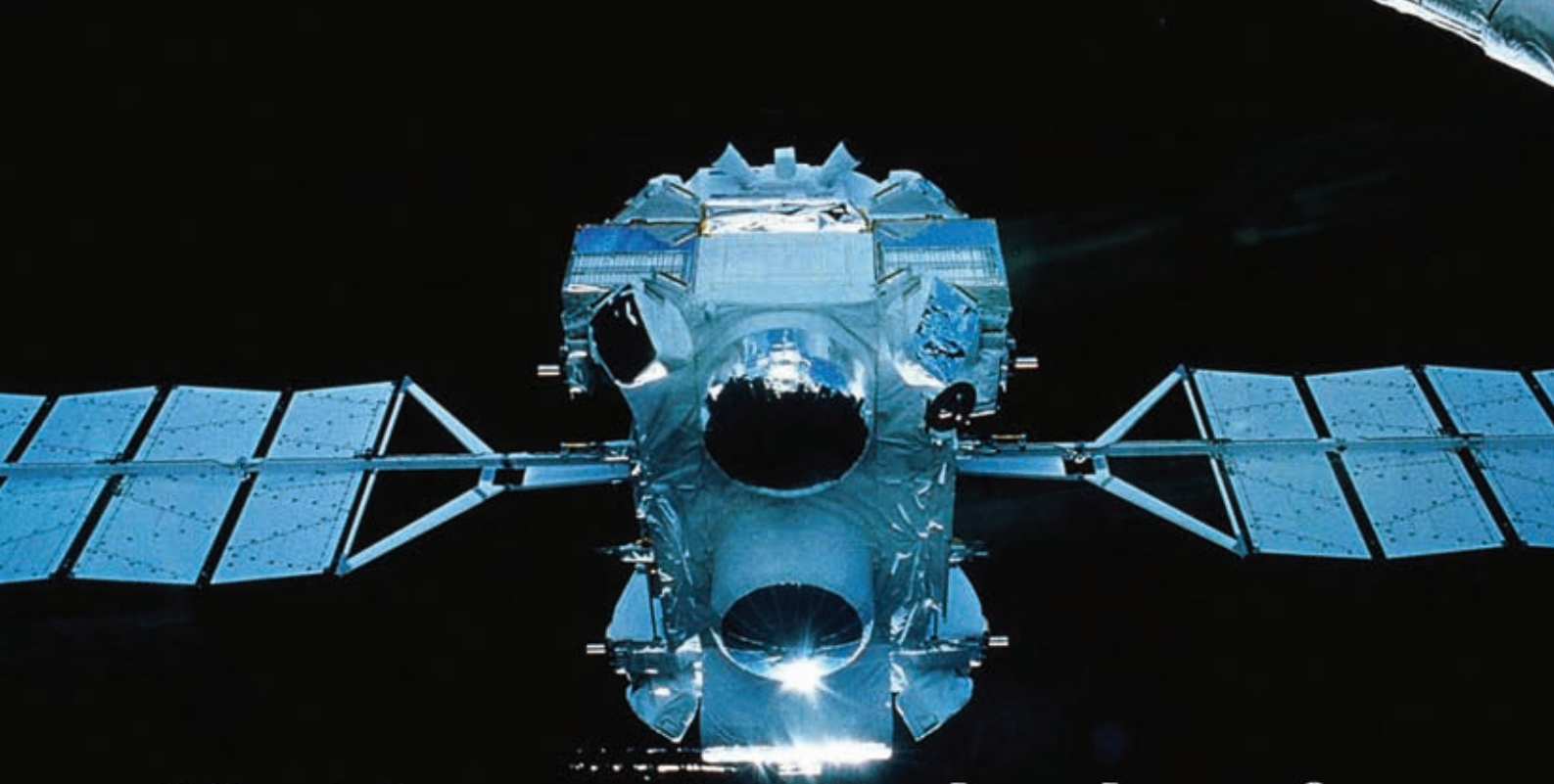
Another example of a Tier-1 mobile network operator deploying a satellite-based LTE cellular backhaul solution is KDDI in Japan. One of Asia's largest telecommunications providers, KDDI is deploying Gilat's VSAT solution to extend coverage and strengthen resilience for its nationwide LTE network.

Hundreds of Gilat VSATs are being deployed throughout Japan, including both remote and metro-edge areas. VSATs are installed in fixed cell sites as well as on deployable vehicles – known as cellular on wheels (CoW). In emergency response scenarios, the CoW solution, consisting of a Gilat VSAT and a cellular base station, allows KDDI to quickly setup satellite backhaul connectivity at the required location.

Gilat's satellite backhaul solution enables KDDI to provide high performance LTE connectivity to residents and visitors throughout Japan, as well as serving as a basis for KDDI's disaster recovery capabilities.

The proof is in the pudding

These real-world examples demonstrate that satellite-based cellular backhaul is much more than a fallback option when terrestrial solutions are not viable. Now able to deliver true LTE performance in a cost-effective manner, satellite backhaul solutions are rapidly transitioning from a niche play to the technology of choice for leading MNOs worldwide.



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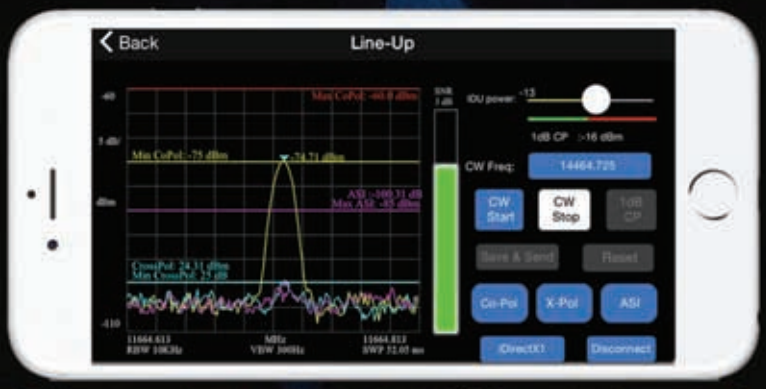

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