Ericsson Enterprise Wireless Solutions

Unlocking 4G LTE and 5G Non-Terrestrial Network Use Cases

Executive Summary

Astonishingly, only half of the world's population is connected to the internet. It is a complex problem, exacerbated by regions of smaller population densities and the capital and operational expense outlays tied to deploying expansive public fiber and traditional public mobile networks. Private 4G LTE and 5G cellular networks and fixed wireless access deployments have great promise in both industrial use case transformation and closing the global digital divide. These solutions offer connectivity diversity, leveraging the provisioning flexibility and cost-effective coverage required for less densely populated regions — ultimately providing fiber-like performance powered by the lower latency and performance profiles enabled by 5G. Coverage gaps will continue to persist, but a new connectivity element can be deployed: low Earth orbit (LEO) satellite infrastructure.

LEO constellations and the creation of non-terrestrial networks (NTNs), buoyed by the efforts of AST SpaceMobile, Starlink, and others, are quickly emerging as viable considerations to support connectivity on a ubiquitous scale. These NTNs can enable first responders to roam between rural and populated areas and provide enterprises with primary wide area network coverage in areas underserved by terrestrial cellular networks. Furthermore, integrating LEO satellites into traditional radio access network infrastructure and terrestrial spectrum can also provide link diversity for commercial sites that require backup for wired connectivity.

Moor Insights & Strategy believes that Ericsson Enterprise Wireless Solutions (formerly Cradlepoint) is well positioned to accelerate the use of LEO satellite WAN coverage and direct-to-unmodified-device connectivity to enable enterprise use cases. The company continues to demonstrate its capabilities in this regard, evidenced by decades of success in providing secure, enterprise-grade wireless WAN and private networking solutions.

THE VALUE OF LOW EARTH ORBIT SATELLITE CONNECTIVITY

There is great potential for LEO satellite deployments to play a pivotal role in bridging the connectivity needs of first responders, municipalities, and enterprises that operate in rural areas. This is anchored by recent 3GPP standards support for NTN integration into 5G mobile network infrastructure. To address coverage gaps, several companies are vying for share in this burgeoning space, with AST SpaceMobile and Starlink rising to the top as leaders providing highly performant infrastructure at scale. The intense competition will likely breed innovation and speed the time-to-value realized for LEO satellite integration into mobile terrestrial networks.

LEO satellite's potential to serve as an enterprise WAN connectivity alternative is immense. It can provide connectivity coverage over long and remote distances and serve as a highly available consideration in the event of natural disasters, doing so cost-effectively depending on the selected subscriber plan. However, challenges persist with variable performance and high amounts of loss and latency, generally lower upload and download speeds compared to cellular, copper, or fiber networks, and an inability to penetrate through buildings and other obstructions. Most importantly, a lack of embedded security controls could limit its use within enterprise deployment scenarios. What is required is an infrastructure provider that has depth in providing enterprise WAN solutions that can address the shortfalls of LEO satellite connectivity.

WHY ERICSSON ENTERPRISE WIRELESS SOLUTIONS

The combination of cellular and LEO satellite infrastructure can be transformative, especially when resilient and secure connectivity is required outside populated areas. Given Ericsson's acquisition of Cradlepoint in 2020 and its subsequent deep integration into the company, Ericsson Enterprise Wireless Solutions is poised to address rural enterprise connectivity challenges around flexibility and integrated security.

- **Flexibility —** There is considerable value in leveraging LEO satellite connectivity as a backup connection for cellular or as a tertiary connection for fiber and cellular. This applies to mobile deployments that require constant connectivity when roaming between populated and rural areas, and for sites in locations that are subject to major weather events to ensure constant connectivity. Ericsson continues to demonstrate its depth in enterprise-grade wireless WAN to support the emerging integration of LEO satellite infrastructure, for example in recent proofs of concept and commercial deployments with the Wyoming Highway Patrol and SA Power Networks Australia.

- **Higher resiliency and performance —** Bonding cellular and LEO satellite connectivity together provides higher levels of resiliency, performance, and cost control, especially for first-responder use cases. The ability to duplicate applications across both WAN connections simultaneously ensures extremely high availability for mission-critical traffic. Flow balancing allocates flows across the WAN connections according to user-defined weights. Bandwidth aggregation provides higher aggregate throughput for a single bandwidth-hungry application. These three bonding features can meet the demands of enterprise and public safety applications at scale.
- **Loss mitigation —** LEO satellite connections can be subject to packet loss. Consequently, there is tremendous value in applying SD-WAN features such as forward error correction to these WAN connections to mitigate against loss. With this feature enabled, redundant bits are added to an application flow to prevent application retries. This can equate to a higher application quality of experience, especially for TCP-based traffic — something Ericsson has long provided to enterprise customers.
- **Integrated security —** LEO satellite-based NTNs provide standard encryption and security for WANs. However, satellite modems have a relatively small number of embedded security features. Ericsson's broad set of cellular routers and zero-trust security features can enable significant security enhancements within LEO satellite WANs. Specifically, one of the company's key differentiators is a link-bonding solution that creates a zero-trust underlay in lieu of a site-based VPN that can be compromised more easily by bad actors.
- **Management simplicity —** There is huge value to the enterprise in having a cloud management and orchestration layer that can provide visibility into the performance of cellular, satellite, and other types of WAN connections, as well as provide consistent provisioning of zero-trust and SD-WAN-related policies. Ericsson's NetCloud Manager simplifies the configuration, deployment, operation, and troubleshooting of the overlay and underlay networks, bringing LTE/5G, SD-WAN, and security under a single pane of glass.

Call to Action

Significant operational and economic challenges exist in delivering widespread connectivity for first-responder, enterprise, and industrial use cases. Yet LEO satellite connectivity and its ongoing integration into terrestrial mobile networks is promising. NTNs can serve as a vital middleware element to enable first responders to roam between rural and populated areas and provide enterprises with primary and redundant

wireless WAN coverage in areas underserved by traditional cellular networks. However, the security of these connections is paramount, a weak underpinning of deploying LEO satellite infrastructure on its own.

MI&S believes that Ericsson continues to demonstrate its ability to unlock 4G LTE and 5G NTN commercial use cases. It offers deployment flexibility, higher performance and availability through bonded connections, enterprise-grade traffic loss mitigation and security, and deployment and management simplicity. This powerful set of features can unlock the true promise of wireless WAN connectivity at scale and across areas underserved by terrestrial broadband connectivity.

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