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ENABLING SEAMLESS GLOBAL CONNECTIVITY FOR PRIVATE NETWORKS

BICS sees growing awareness of the benefits of private cellular networks among enterprises

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INTRODUCTION

Large enterprises typically operate multiple campuses in sectors like transportation, manufacturing, ports, airports, hospitals, smart cities and energy, as well as governmental instances. These enterprises typically work in isolated "islands". Their devices and employees need to stay seamlessly connected when moving outside of these islands, and seamlessly connected when they re-enter the mobile private network (MPN).

However, private networks are typically managed by IT departments or external parties like system integrators and managed service providers. Neither the enterprise nor the integrator typically has depth of knowledge concerning roaming outside the MPN. According to BICS, a voice and messaging international carrier and a specialist in global mobility services for 2G, 3G, 4G, and 5G networks, establishing roaming for MPNs is a major operational challenge for enterprises as they lack the expertise, resources and relationships to set this up. In addition, BICS noted that enterprises are not in a position to negotiate or set up these technical and commercial agreements with hundreds of worldwide networks to allow their devices and people to roam seamlessly.

A typical use case would be a mobile private network at a factory, which has vehicles that need to travel to another plant of the same company. They must stay connected while they travel so that the company can track their status, and they need to reconnect seamlessly once they arrive at the other plant. During travel, they need to connect to public mobile networks to remain seamlessly connected. Another example would be the case of a wind farm operator with wind farms located across multiple remote and offshore sites, which has a mobile private network at each of them. Equipment is connected to the local mobile private network but needs to stay interconnected, so it can be relocated between sites, and monitored and managed from a central control center. Engineers and technicians also need seamless connectivity as they visit different sites.

AWARENESS OF PRIVATE NETWORKS IS GROWING AMONG ENTEPRISES

Ann Heyse, Global Telco Solutions Manager at BICS, told RCR Wireless News that there is growing awareness about the benefits and potential of private networks for businesses. "Many governments in particular are very aware of this and are funding and encouraging businesses to deploy private networks. In Western Europe, there are governments who have appointed a single system integrator to map all the ecosystem players

to support enterprises in finding the right vendors. However, more education is still needed on the specific use cases for different industries, as well as the technical knowledge needed to deploy such networks."

Heyse also said that there is a lot of discussions going on among all the ecosystem players who are getting to know each other and to understand who is solving which part of the puzzle regarding the deployment of private networks. "We foresee that by 2023 important partnerships will have been formed and more use cases will become clear," she said. "For the moment, a lot of brainstorming is happening on finding the use cases, and building the business cases to justify the enterprise to upgrade from Wi-Fi to private 4G or 5G."

To navigate the private LTE and 5G markets, enterprises have had to step up and empower themselves with knowledge on the deployment and management of these technologies. Surveys are already showing that enterprises are aware of the cost-benefit equation of these technologies. Enterprises interested in the deployment of private cellular networks must in the first instance see the benefits of private LTE or 5G compared to other, lower-cost technologies, while examining how that deployment should be managed from a connectivity perspective.

MAIN CHALLENGES FOR ENTERPRISES DEPLOYING PRIVATE NETWORKS

Commenting about the main challenges that organizations are currently facing in the overall process of deploying private networks, Heyse highlighted that enterprises do not have experience in setting up and managing a mobile network. "Their IT departments who were taking care of the broadband connection/Wi-Fi now need to roll-out and manage a mobile network. Hence, we now see more and more players entering this space in providing consultancy services. Getting the right spectrum is also a challenge; typically, enterprises would turn to a local public network to get a slice of their spectrum, but often the much sought-after 5G spectrum is not available yet," Heyse said.

The executive added that enterprises also face a key challenge in the optimization of costs. To deal with this challenge, Heyse said that the telco industry is exploring different models, including Private-Networks-as-a-Service (PNaaS).

According to BICS, another key challenge for enterprises is mobility: Most private networks are built as separate, discrete locations with no connectivity beyond their own radio network—but often users or devices need the ability to roam onto public networks and return seamlessly to the private network. "The switching between private and public networks is a challenge that gets a lot of attention. Use cases like vehicles, laptops, employees, etc. … needing to stay 'always connected' also when moving out of the private network premises proves to be a must, both nationally and internationally," Heyse added.

In order to fulfill these requirements, the private network would need to set roaming agreements in place, and often, private network devices might need to connect to multiple public networks as they travel around the world. "BICS has several roaming solutions in place depending on the type of private network to provide national and international connectivity globally. Private network customers would only need a single agreement with BICS, and their devices and assets will be able to roam onto hundreds of mobile networks around the world for all mobile

technologies available in those public mobile networks (2G/3G, 4G, 5G NSA, LTE-M, NB-IoT)," Heyse said.

She went on to add: "Another challenge is the inter-site connectivity; often enterprises have more than one private network. BICS can interconnect all sites and harmonize the services for the enterprise into one network for full visibility and control. This brings the benefit of harmonization of the services; this way the enterprise doesn't need to deploy the same service in each and every of its private networks but can deploy it in one location and make it available across their entire network." An example of this would be an enterprise with its headquarters in New York, with satellite offices in Montreal and Paris and manufacturing plants in India and Brazil, which could deploy its mission-critical server in India and their IMS to support voice calls in Montreal and use those services across all its other private networks," the executive said.

ENTERPRISES ADOPT PRIVATE 5G NETWORKS DUE TO SECURITY ISSUES

BICS also believes that one of the main reasons for enterprises to upgrade their Wi-Fi to 5G private networks is security, as 5G is secure

by design. According to Heyse, an enterprise deploying a private 5G network will have much greater control over its smart devices. "Even when roaming out of their own private network into public networks they can be assured of the highest security provided by our platforms," she said.

According to a *Connectivity Enablement for private networks* by consulting and market research firm Kaleido Intelligence, private LTE and 5G networks can be deployed under a variety of models, depending on the requirements of the use case and the customer. Historically, private networks have been configured as fully-isolated entities, with all data and communications confined within the secured zone. Naturally, such configurations are possible with LTE and 5G, but have normally involved high capital expenditures for customers due to on-site core network hardware, radio units and user equipment in addition to the costs involved in design, set up and other ancillary items and services. Typically, these sites have been deployed for business-critical operations with very high security and performance requirements, with relatively little desire for inter-site connectivity or connectivity enablement for devices that operate both inside the private network as well as outside, according to the report.

However, as the customer base for private networks expands, the dynamics in terms of connectivity requirements are changing. The Kaleido Intelligence report revealed that an increasing number of private network customers are interested in inter-site connectivity, whereby two disparate sites can be linked in order to share data. However, this desire is not always practical to implement, due to the fragmented nature by which private networks can be deployed across the globe in terms of spectrum availability, partners and hardware support. "Requirements are also changing in terms of how connectivity is enabled for individual sites; particularly for vertical industries such as transportation and manufacturing. In this context, the desire to support connectivity for devices both inside the private network as well as when those devices migrate outside of the security zone is increasing," the report reads.

NEW CELLULAR PRIVATE NETWORKS REQUIRE HIGHER LEVELS OF FLEXIBILITY AND GLOBAL MOBILE ACCESS

The Kaleido Intelligence report states that the base of LTE and 5G private network sites is projected to increase from 576 in 2019 to 22,719 in 2026, representing a compound annual growth rate of 69% during the period. Europe, East Asia and North America are expected to account for the bulk of private LTE and 5G deployments, with a substantial number of sites deployed across verticals such as energy and utilities, manufacturing and transportation.

Emerging cellular private network solutions require a high degree of flexibility–most notably across specific verticals including airports, maritime ports, logistics warehouses, logistics fleets and the aforementioned manufacturing and industrial facilities.

In all of those types of use cases, "private network customers often rely on a high degree of mobility in terms of the workforce as well as devices and assets used inside the private network. Authenticating and seamlessly integrating devices that move between public and private networks is not a simple task and requires the services of a specialist to ensure that service delivery is optimized," the Kaleido Intelligence report notes.

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The report also concludes that the international nature of IoT as well as workforce sourcing, particularly in manufacturing and transportation use cases, means that devices in question may originate from several different places in the world. It offers a suggested solution to this complexity: Work with an expert in connectivity services. Typically, that is done by working with a mobile network operator who has global roaming agreements and will issue supported SIM cards to businesses. But this still has a downside, the report points out: "While many providers have multiple bilateral agreements to facilitate roaming, these are often complex and time-consuming even for established CSPs to navigate and extend the footprint where required. Essentially, an enterprise customer using the bilateral agreements set up by a single CSP is unlikely to receive optimum coverage or performance for its devices all over the globe."

Roaming hubs have been around for more than 15 years now for public networks to connect to each other. However, BICS aims to extend these roaming hubs to the private network space, to enable these networks to become part of the "roaming world". Roaming hubs provide access to multi-lateral roaming arrangements in a more streamlined and holistic process with a single technical and operational relationship. The roaming hub provider, such as BICS, is the entity responsible for establishing and managing those roaming agreements, in turn allowing the customer to access all of the agreements in place with members of the hub. This model greatly increases the number of potential networks that the enterprise can access.

"BICS' vision is to help bridge the gap between private and public networks, by building a connectivity hub where any mobile network (private or public) can allow roaming on each other's network - through just one connection and one bill to handle, for a truly connected world of things and people, wherever the need is to roam," Heyse said.

ABOUT BICS

BICS is at the heart of the communications ecosystem, connecting people, applications, and things wherever they are. For more than 20 years, we have addressed the needs of mobile operators, cloud communications services, and enterprises across all geographies, thanks to our fully-owned global network, and unmatched relationships with hundreds of operators. BICS solutions enable global mobile connectivity, seamless roaming experiences, fraud prevention and authentication, global messaging, and the Internet of Things. To find out more about how BICS can meet your specific connectivity needs, please get in touch.