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Transitioning to Private LTE: A Blueprint for Utility Leadership

Deploying a Private LTE (pLTE) network is far more than a routine hardware refresh; it represents a fundamental transformation in how a utility communicates, monitors, and operates its grid. Traditional communications environments have long been built on a patchwork of purpose-built systems, such as Land Mobile Radio (LMR) for mission-critical voice communications and SCADA networks for telemetry and control of substations, switches, and other field assets. While these legacy systems are proven and reliable, they are often siloed, bandwidth-constrained, and limited in their ability to support modern, data-intensive applications.

In contrast, pLTE functions as a unified, high-bandwidth digital nervous system, converging voice, data, and operational traffic onto a single, secure platform. It enables seamless connectivity across a wide range of endpoints; from smart meters and distributed energy resources to field crew tablets, sensors, and automated switchgear, while also supporting advanced applications like real-time video, predictive analytics, and grid automation. By breaking down the barriers between legacy voice and data networks, pLTE empowers utilities to move from reactive operations to a more integrated, intelligent, and responsive grid.

To succeed, the pLTE transition requires a structural rethink that bridges the gap from the boardroom to the bucket truck, and from telecom groups to a utility's grid planning, engineering, and operations organizations. In this article, we explore key ideas and real-world experiences around the organizational considerations utilities must address as they move into the pLTE era.

The Executive Suite: Partners in Setting the Vision

At the top level, pLTE must be treated as a strategic asset, not a line-item expense. This means that the "siloes" approach to IT (Information Technology) and OT (Operational Technology) needs to evolve. A key step towards breaking down these traditional organizational barriers is the formation of a partnership led by the CIO/CTO and COO/grid leadership. This partnership creates alignment across the enterprise for the multi-year capital investment of pLTE with long-term grid modernization goals, such as wildfire mitigation, EV integration, and other advanced grid management use cases.

In addition to making the operational case for pLTE, the leadership also needs to track the Return on Investment (ROI), which can be significant in the context of a telecommunications system's Total Cost of Ownership (TCO). For example, as pLTE can consolidate multiple carrier contracts and legacy narrow-band networks into one utility-owned network, the executive suite needs clear reporting on cost savings and reliability, resiliency and security gains... the investment is more than just reliability.

As example of this organization model and its benefits can be found at Ameren, an investor-owned utility based in St. Louis, Missouri. Tim Spyers, Sr. Manager, OT Network Engineering & Private LTE at Ameren, shared the experiences at Ameren as the utility moved towards pLTE: *"For us it was a true partnership with three executive sponsors: the senior director from the Missouri energy delivery organization, his counterpart with the Illinois energy delivery organization, and our Vice President of Network Engineering and Operations. This group went before the executive leadership and then the Board of Directors to "pitch" the operational and business benefits of pLTE. Having this partnership is what helped make the case for moving forward."*

IT/OT Convergence is A Thing

The utility industry has been grappling with IT/OT convergence for at least a couple of decades. Historically, IT handled computers and telecom, and OT handled the grid. There have been some additional segments inside of these traditional silos. For instance, the SCADA people were "hands off" for anybody outside of the control center and the GIS teams were keepers of the geospatial data.

Here's the thing: pLTE lives in both the IT and OT worlds. There is a strong case to be made that utilities need a "Converged NOC (Network Operations Center)" where network engineers work alongside grid dispatchers. If a cell site goes down, it's no longer just a telecom issue, it's a grid visibility issue.

"To me, IT/OT means we are digitizing the grid. We need IT technologies and communications networks to run the grid infrastructure. It is impossible to run the grid of the future without advanced communications that are integrated – operationally and organizationally – with the grid organization. It's no longer a nice to have."

While this makes a lot of sense pragmatically, old habits die hard. Adam added that, "one challenge we are seeing is that we have very limited number of people who truly understand the world of their IT/OT counterpart. While this is not always the case, in many utility organizations communications people don't fully understand how grid operators use the networks and grid operators don't fully grasp what it takes to build and run advanced communications. As an industry, it is critical that we bridge this gap."

- Adam Nathan, World Wide Technology

Adam's World Wide Technology colleague, Mike Robinson, shared this observation: "Historically we have had 'shadow IT.' What is really needed is 'embedded IT – putting network architects into the business (grid). They can also act as liaisons between IT and grid. Whoever is in this position needs to be forward thinking, driving the adoption of advanced architectures."

Making It All Work

With strong executive leadership and a clear sense of the organizational needs as a utility moves into the pLTE space, there is still a "To-Do" list to ensure that pLTE investments and efforts meet and exceed business and technical expectations. Here are a few items to be sure are on that list:

- **Cybersecurity:** Public networks, by definition, are connected to the Internet. pLTE is not, but the CISO (Chief Information Security Officer) must still integrate pLTE security into the broader utility footprint. And since pLTE uses SIM-based authentication, the organization needs processes and people for managing digital identities for thousands of field devices.
- **Spectrum Management & RAN Design:** Utilities need a group that manages the licenses and ensures the network is designed for the specific topography of the service territory. Similarly, RAN design and optimization requires a very specific skill-set that may not exist as the utility transitions to pLTE.
- **Standards, Interoperability, & Device Configuration:** Utilities also need a group that ensures that every new device purchased, from a recloser to a laptop, is suited and optimized for the pLTE security protocols. Perhaps more importantly, this is ensuring that every device is optimally configured to perform with the specific utility network architecture and security protocols.
- **Development of a training culture:** The best network in the world is useless if the people across the enterprise and in the field don't trust it. Leaders need to be stewards of training up their staffs and crews to achieve not only competence but also "super users."

The transition to a pLTE communications infrastructure is not just about technology. It is equal parts technology, people, and process. The blueprint for success calls for executive leadership that elevates the business value of pLTE and shepherds a culture that embraces change, training & development, and a can-do attitude.

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