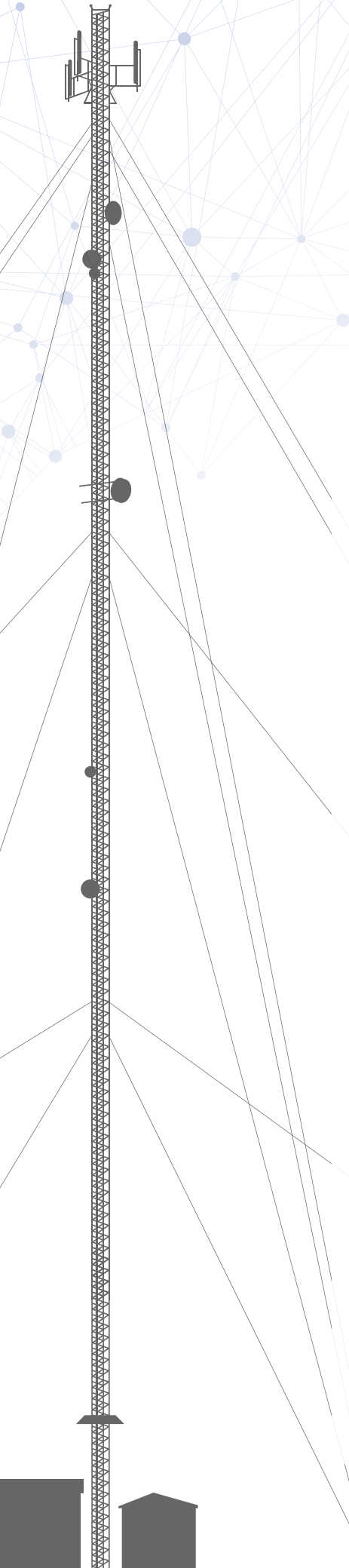

LISTENING TO YOUR RADIO NETWORK DATA

How analyzing operational data from LMR systems strengthens coverage, reliability and effectiveness

Is there an area in your community where radio calls don't always go through? A tower site that's often overwhelmed? The answer as to why this happens may come from a surprising source: the data generated by your Land Mobile Radio (LMR) system, your devices and other external sources.

LMR networks generate terabytes of data every day. This operational data — from sources like individual two-way radios and system logs from tower sites — can be mined for insight, allowing public safety agencies to improve two-way LMR system coverage, performance and resiliency. But collecting and managing massive amounts of LMR data has been a challenge for these agencies, as most don't have the in-house analytics expertise to turn data into useful knowledge.

A NEW RESOURCE: NETWORK PERFORMANCE MANAGEMENT ANALYTICS

Motorola Solutions combines data intelligence with in-depth analytics so agencies can gain insights from their radio networks to identify system improvements and minimize future downtime. Using these insights, the Motorola Solutions Managed Services team can pinpoint and resolve real-time radio or connectivity problems before they disrupt or degrade network service. The machine learning algorithms behind the analytics compare a network's current operation with normal system behavior and search for anomalies to quickly identify performance issues such as:

- ☑ System demands that exceed network capacity
- ☑ Link errors
- ☑ Radio frequencies that need optimization
- ☑ Illegal carrier risks
- ☑ Subscriber rejects

In addition to solving immediate problems, the Motorola Solutions Network Performance Analytics Service lays the foundation for long-term radio network improvements. Motorola Solutions data experts conduct in-depth data assessments and apply predictive models to identify trends and forecasts that provide agencies a rich understanding of their LMR network performance.

HOW IT WORKS: A SINGLE SOURCE OF TRUTH

The Motorola Solutions Network Performance Analytics Service collects data produced by the diverse elements in an LMR system into a single repository called a data lake. Maintaining LMR and associated data in a central lake allows analytics to run with a single source of truth, which produces highly accurate and relevant results.

Data collected from two-way radios includes device and accessory usage, as well as overall device health statistics. Tower site data collection includes system logs and utilization statistics

for the network links. The service also accepts data from other sources, including correlated events, fault management and repairs in the radio system, weather statistics, and location and terrain information.

GETTING AHEAD OF PROBLEMS

Advanced analytics offer a proactive approach to optimize LMR network performance.

- **Better coverage.** By analyzing radio coverage levels, agencies can identify needed system design improvements to solve "dead spots" or fluctuations due to weather and terrain. They can also optimize service areas based on historic use patterns, as well as fleet movement among key locations. Improving coverage also helps ensure radio calls don't drop while officers are in motion.

- **Fewer network disruptions.** Analytics can pinpoint the root cause of LMR network problems to a specific device or site. For example, high levels of packet loss in a particular network link may be caused by an element failure in a base station or tower. Analytics can also help monitor the usage, roaming areas and abnormal behavior of individual radios. Agencies can optimize their radio fleets without requiring a costly and time-intensive health check and device reconfiguration.

- **Increased preparation for network outages.** Events, storms, disasters and other high-demand scenarios have a tremendous impact on LMR network performance. Agencies can better predict the impact of these events by determining which communications are mission critical and identifying needed network capacity tuning.

- **More thorough post-event analysis.** Comprehensive data analysis supports after-the-fact investigations and audits so agencies can better understand system usage and determine if standard operating procedures were followed.

LEVERAGING RADIO DATA FOR IMPROVED PUBLIC SAFETY

LMR data offers agencies opportunities to improve operations and, ultimately, public safety. Responders need reliable communications to stay safe and protect their communities.

However, those opportunities are only realized if an agency leverages the right expertise. Now, LMR network analytics can help agencies improve a critical aspect of their operational communication to optimize radio system performance. The LMR network performance management services from Motorola Solutions securely capture data from all important elements of an LMR network, along with other associated sources. By combining industry-leading analytics with consulting provided by service delivery experts, the data analysis is converted to meaningful insights to improve network performance and resiliency and boost agency effectiveness.

Public safety agencies are already using analytics for predictive policing and to improve EMS response. Now, LMR network analytics can help agencies improve a critical aspect of their operational communication.

WHERE ARE THE NETWORK PERFORMANCE EXPERTS?

It's a unique combination that is hard to find: Someone who understands the performance aspects of LMR networks, the operational factors of public safety agencies and the advanced analytics used to derive actionable performance insights. Such expertise is next to impossible to find in one individual. It takes a unique team, analytical platforms and tools to establish and maintain network performance expertise. By partnering with an external vendor, agencies can tap into this expertise and benefit from the vendor's broad knowledge of other LMR networks and operational best practices.

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