Redefining Reliability for EV Charging Infrastructure

Challenges

A leading provider of EV charging and energy management solutions relies on a large fleet of mission critical devices deployed across customer locations. These devices require continuous, reliable connectivity to support operational visibility, remote management, and real time data transmission. Because the equipment operates in diverse and sometimes unpredictable environments, the organization needs a communications model capable of meeting strict uptime requirements and maintaining stability during network disruptions.

However, the field devices were originally configured to use a single wireless carrier, creating an unseen vulnerability in the connectivity architecture. When the first major carrier outage occurred, active locations experienced immediate disruption. A second outage soon followed, confirming the structural risk of relying solely on one network and prompting a joint evaluation with Granite to strengthen resiliency.

Customer Profile

Industry
Energy

About
Leading provider of EV Charging

Single Carrier Dependency With No Redundancy
The organization's field equipment operated exclusively on one wireless carrier, leaving the entire environment exposed.
Two significant outages quickly disrupted operations and revealed a clear single point of failure.

Lack of Predictable Carrier Failover Behavior
Initial testing of multi carrier functionality showed that devices were unable to transition between carriers.
The SIM's inability to switch networks resulted in onboarding failures and unreliable performance.

Hidden Firmware and Configuration Issues
Granite's analysis uncovered multiple failure points within the device's internal switching logic.
Limited visibility into these behaviors made diagnosing the underlying issues challenging.

Operational Risk and Exposure During Live Outages
Repeated carrier outages demonstrated that the organization lacked any alternative path for maintaining connectivity.
The absence of redundancy increased operational strain and created system wide vulnerability.

Need for a Resilient, Scalable Connectivity Model
The organization required a connectivity architecture that could support consistent performance across all deployments.
Automated, predictable failovers became essential for long term reliability and future expansion.

Solutions

Granite collaborated with the device manufacturer to identify the root cause issues behind failed carrier transitions and implement targeted enhancements that enabled reliable, scalable multi carrier performance across the field environment. Through engineering updates, real world testing, and a structured rollout plan, the teams established a fully redundant connectivity model that eliminated single carrier exposure.

Device Configuration Updates for Stable Multi Carrier Operation
· Developed a new device configuration tailored to the organization's operating environment.
· Optimized connectivity parameters to ensure predictable carrier recognition and switching.

Firmware Enhancements to Correct Failover Behavior
· Deployed firmware updates enabling proper acceptance of carrier changes and failover commands.
· Resolved switching logic issues that previously caused onboarding failures.

Iterative Engineering Collaboration and Validation
· Conducted detailed analysis and validation cycles to confirm updated firmware behavior.
· Maintained continuous collaboration across engineering teams to verify improvements.

Real World Carrier Failover Testing
· Performed live environment testing to confirm seamless, predictable transitions between networks.
· Verified stable failover performance under diverse deployment conditions.

Methodical Rollout Across Deployed Equipment
· Executed a controlled, phased deployment of updated configurations.
· Ensured minimal operational disruption while significantly improving reliability.

Results

By deploying a fully redundant multi carrier solution and resolving the underlying firmware and configuration issues, the organization achieved substantial improvements in field connectivity stability and resilience. The operation now benefits from:

· Elimination of single carrier vulnerability revealed by repeated outages.
· Reliable multi carrier performance, with seamless failover functioning as designed.
· Consistent, predictable device onboarding enabled by corrected switching logic.
· Improved operational resilience, reducing disruption during carrier specific network events.
· Executive level visibility into network reliability risks and system maturity.
· A scalable, repeatable deployment model supporting future field expansion.

Granite's partnership transformed a fragile, single point of failure environment into a resilient, redundancy driven connectivity ecosystem. By enhancing device firmware, optimizing configurations, and validating real world multi carrier behavior, Granite delivered stronger uptime, simplified deployments, and a more mature operational framework.

With a stable, multi carrier foundation and a trusted engineering partner in place, the organization is now positioned to scale confidently ensuring each new deployment launches with consistent performance, predictable resilience, and the connectivity infrastructure required for mission critical EV charging and energy management operations.