CORPORATE ENGINEERING

ESG

CASE STUDY

E911 LOCATION PERFORMANCE

Delivering technical evaluations and services to operators

Qualcomm Corporate Engineering's ESG helped U.S. operators identify and troubleshoot failed Emergency 911 (E911) calls to ensure compliance with the E911 mandate issued by the Federal Communications Commission (FCC).

SITUATION

Providing effective E911 coverage on both advanced & legacy networks

The Federal Communications Commission (FCC) issued an E911 mandate requiring U.S. operators to accurately report the location of a mobile device when it is used to place a 911 call .

Operators use Global Positioning Service (GPS) to determine device location when a 911 call is placed. When an operator transitions from GSM to HSPA, the GPS must be able to support E911 calls originating from networks using either technology.

CHALLENGE

Discovering the cause of call failures and delays

Prior its HSPA launch, a Tier 1 operator determined that a number E911 calls attempted on its GSM network either failed, did not complete in a timely manner, or experienced location determination inaccuracy. The operator found it challenging to establish the root cause of these issues because:

- separate vendors were used for infrastructure equipment and serving mobile location centers (SMLC)
- specific logging and analysis tools are needed when migrating to a new technology (HSPA), while also considering E911 requirements

SOLUTION

Reaching out to Qualcomm for best practices

Qualcomm ESG worked with the operator's E911 deployment team to design and perform field test campaigns in several markets with different combinations of network infrastructure and SMLC vendors. The campaigns included fixed location and drive testing, as well as position-location testing using specialized logging and analysis tools developed by Qualcomm ESG.

COMPANY

- Tier 1 operator
- Nationwide deployment of HSPA
- Project targeted multiple regions with several combinations of different infrastructure and SMLC vendors

SITUATION

- **E911 performance problems for mobile devices operating in GSM mode**
- **Multiple network infrastructure providers serving multiple location centers**
- **Inadequate location debugging expertise and tools**

SOLUTION

- **Performed fixed-location, drive, and field tests with many network infrastructure and SMLC vendors**
- **Used specialized handset logging and data analysis tools**
- **Recommended improvements to operator's parameter process and database maintenance procedures**
- **Suggested operator approach infrastructure and SMLC vendors regarding performance concerns**

RESULTS

- **E911 performance on GSM networks improved by up to 75%**

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E911 LOCATION PERFORMANCE

Data analysis revealed that the majority of performance issues were related to the preemption of the location positioning data exchanges between the handset and SMLC, primarily caused by handovers. Issues related to parameter settings and data base maintenance were also identified.

Qualcomm recommended the operator request software and operational changes from their infrastructure and SMLC vendors and also suggested parameter and operational changes for improving performance.

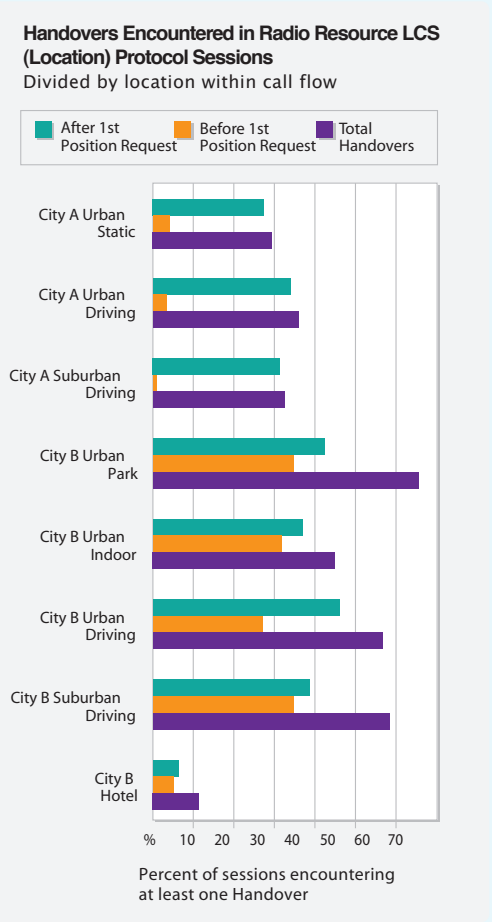
Qualcomm worked with the operator and vendors to make certain all changes were implemented correctly and performed additional field testing and analysis to verify results.

RESULTS

E911 performance improved 75% on GSM networks

Qualcomm ESG delivered a comprehensive report to the operator detailing the various issues, root causes and specific recommendations. This helped the operator to improve internal processes and empowered them to address and resolve issues with their infrastructure and SMLC vendors.

Figure 1: Location Attempts with Preemption



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