

## MANAGING BSA DEPLOYMENT FOR LOCATION-BASED SERVICES

### Delivering services and technical evaluations for network operators worldwide



Qualcomm Engineering Services Group (ESG) accelerates the adoption of mobile technologies through initiatives, professional services and technical education. By analyzing and recommending technology evolution solutions, optimizing network design and deployments, educating via technical training and customized workshops, and collaborating with key industry

groups, Qualcomm ESG enables operators to efficiently migrate to next-gen technologies. The following case study explains how Qualcomm ESG helped a Tier 1 operator design a standardized Base Station Almanac (BSA) and develop processes to ensure continued accuracy and performance of the almanac, preparing the operator for significant savings in future CAPEX / OPEX.

#### AT ISSUE

##### The need for smarter base station almanac processes

For 3G operations, location-based services (LBS)—navigation, points of interest, and social networking—have been one of the key growth drivers for data services revenues. This growth trend in data revenues is leading savvy operators to optimize the LBS capabilities of their core networks.

Assisted GPS (A-GPS) has emerged as the solution of choice for delivering LBS on today's 3G networks. To maximize location fix resolution in A-GPS, the accuracy of the information in the assistance database—known as the Base Station Almanac—is critically important. As a result, operators are seeing the need to increase their focus on the BSA, investing more resources toward generating and maintaining this database. Additionally, rising costs demand smarter creation, monitoring, maintenance and management processes of the BSA.

#### THE CHALLENGE

##### How to effectively standardize disparate BSA processes

With an imminent nationwide launch of LBS, a Tier 1 operator in Asia faced the challenge of developing a standardized process for BSA creation.

The existing BSA creation process was not uniform across the operator's regional teams and thus was error prone. Commercial tools for BSA generation were available in the market, but very expensive. To reduce long-term CAPEX / OPEX, the operator sought to bring BSA generation and maintenance into alignment with in-house tools and processes.

Working together, the operator's engineering organization and Qualcomm ESG addressed these challenges, developing a comprehensive BSA monitoring, creation and optimization process.

#### COMPANY

- Tier 1 operator in Asia
- Nationwide deployment of LBS
- Project targeted a region of seven+ metro cities, covering more than 1500 sites

#### SITUATION

- ▶ Create and maintain BSA in preparation for a commercial LBS launch
- ▶ Develop a single solution for BSA generation and maintenance for all radio access network (RAN) vendors and reduce CAPEX / OPEX

#### SOLUTION

- ▶ Leverage data from the operator's existing network design databases to create an initial BSA
- ▶ Create BSA validation test and maintenance process
- ▶ Develop BSA optimization and maintenance process with detailed flows
- ▶ Streamline processes for operator's internal automation

#### RESULTS

- ▶ Delivery of a new and improved BSA creation and maintenance process
- ▶ Comprehensive process training for operator's regional teams



## MANAGING BSA DEPLOYMENT FOR LOCATION-BASED SERVICES | CASE STUDY



### THE SOLUTION

#### A four-phased approach to process improvement

An ESG subject matter expert (SME) worked alongside the operator for an extended period. Collaborating closely with the operator's engineering team, ESG quickly identified existing processes, deficiencies and available tools. The solution was divided into four major phases:

##### ► Phase 1: Leverage existing data sources

The team assessed the site location data based on network design databases provided by the operator. This data was used to generate an initial nationwide BSA (see Figure 1 -Initial BSA Deployment).

##### ► Phase 2: Isolate and prioritize areas for improvement

Once the initial BSA was generated, Qualcomm ESG helped establish processes for BSA validation in operator selected metro cities.

Using location data collected from target cities, areas where the Advanced Forward Link Trilateration (AFLT) performance needed to be improved were identified and prioritized. Using antenna position accuracy and AFLT calibration, the BSA was further updated and improved (see Figure 2).

##### ► Phase 3: Ongoing updates, maintenance, and performance monitoring

Following the initial optimization effort in select cities, the process was further refined through the establishment of automatic BSA updates, daily performance monitoring and distribution.

##### ► Phase 4: Customized reports for measuring BSA performance

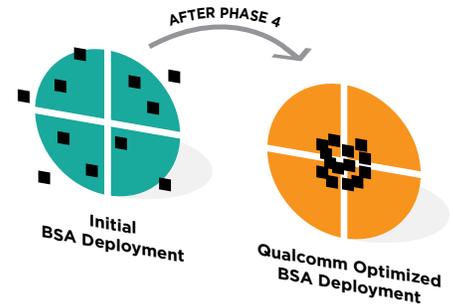
Finally, a series of customized reports were developed for the operator. They were designed to determine LBS data activity on the deployed/in-use location server(s); key performance indicators (KPIs) generation; and other air-interface performance measurements that could impact LBS. Critical information was distributed to appropriate stakeholders on a daily basis through these automated reports.

### RESULTS

The solutions developed by the Qualcomm ESG team enabled the operator to create a new BSA generation and maintenance process. The specialized reports and decision processes developed as part of the project were quickly implemented by the operator's automation framework, bringing increased visibility and easier access to BSA performance information. As a result, the operator's engineering team makes more informed operational decisions. In summary, this project:

- Accelerated time to market of multiple LBS services by three months
- Improved location accuracy in various GPS environments, returning a valid location 99% of the time
- Reduction of reoccurring BSA maintenance costs

**FIGURE 1: Accuracy and Yield Improvements (Sample Results)**



**FIGURE 2: Customized BSA Performance Reports**

