CORPORATE ENGINEERING

ESG

CASE STUDY

PREDICTING COVERAGE AND SIMULATING NETWORK DESIGN WITH QUEST™

Delivering technical evaluations and services to operators

Qualcomm Corporate Engineering's ESG helps operators to manage network coverage and capacity more effectively using their proprietary QUEST simulation tool.

COMPANY

- Operator in North America
- Nationwide deployment of UMTS/HSPA

SITUATION

Performing indoor network coverage and capacity analysis

The operator lacked tools for predicting data traffic at a high attendance sporting event and looked to Qualcomm ESG for an independent, third party network coverage and capacity analysis. During non-game days network traffic remained idle, but increased dramatically during sporting events. Twenty thousand subscribers were expected on game day, each using their cells phone to make calls and access data. There are planning tools for designing outdoor networks to handle data traffic surges; however tools for analyzing indoor environments such as stadiums, convention halls, or concert halls typically don't exist.

Operators can benefit from using QUEST, a simulation tool that accurately predicts network coverage, capacity and data traffic for indoor environments. QUEST uses real-world network data and generates network coverage and capacity results for a given mix of inputs (such as morphology, user equipment, traffic patterns, and/or applications).

CHALLENGE

Predicting usage surges & anticipating coverage constraints

A global wireless operator based in North America anticipated a surge in network traffic during a major indoor sporting event and wanted to improve its network coverage and capacity. They engaged Qualcomm to optimize network capacity and deliver an improved user experience.

SOLUTION

Forecasting data traffic to improve

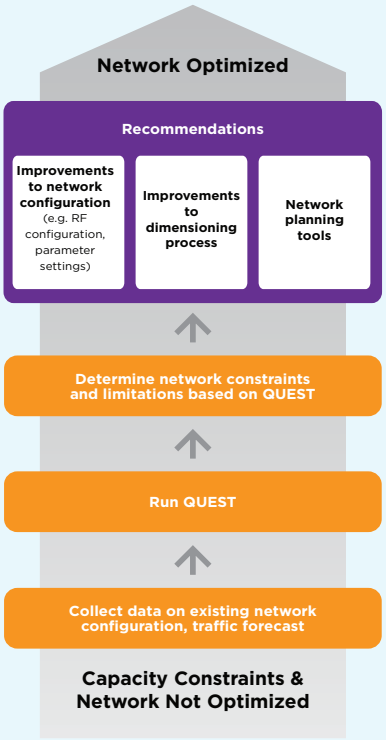
Qualcomm collaborated with the operator to run the QUEST steps depicted in Figure 2 and provided technical consulting and analysis including::

- RF optimization at indoor sites and surrounding macro sites
- Throughput estimates based on network traffic and operator assumptions
- Parameter recommendations to manage network traffic during the event
- Planning and stress test support at the event

SITUATION

- **Anticipated a surge in network traffic during a championship game at a large, indoor stadium**
- **Required capacity and coverage dimensioning for a large indoor event**
- **Limited time and resources did not allow for stress tests**

Figure 1: Managing Data Capacity Constraints



QUALCOMM®

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RESULTS

Using the QUEST simulation for capacity planning

Qualcomm ESG used their propriety tool to estimate cell capacity before and after antenna optimization. As shown in Figure 3, QUEST can accurately predict actual HSDPA throughput traffic. QUEST helped predict the operator's RF needs and required distributed antennae systems (DAS). Using recommendations from Qualcomm ESG, the operator determined optimal antenna placement for providing uniform coverage and sufficient capacity.

RESULTS

- Minimized call drops
- Improved coverage
- Optimized data throughput and managed capacity
- Potential CAPEX and OPEX savings

FIGURE 2: QUEST™ simulation tool

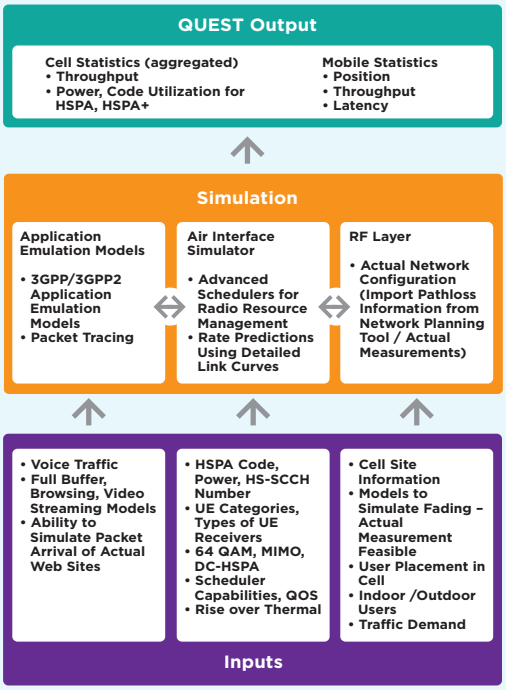
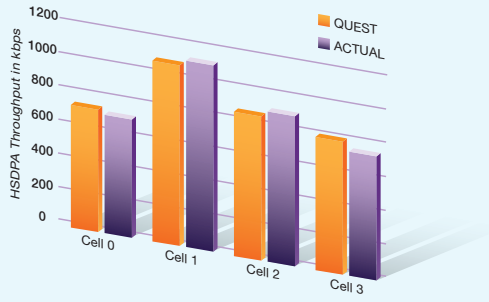


FIGURE 3: Example of capacity prediction at an indoor event



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