CORPORATE ENGINEERING

ESG

CASE STUDY

TRANSPORT NETWORK DESIGN

Delivering technical evaluations and services to operators

Qualcomm Corporate Engineering's ESG provides network services to improve backhaul monitoring and dimensioning, allowing operators to refine network growth plans and eliminate unnecessary spend.

SITUATION

Improving network design improves the bottom line

Rapid growth in 3G network data services has led to increased usage and air interface bottlenecks. With the arrival of HSPA, system bottlenecks have shifted onto transport networks. As a result, operators have been investing in transport networks and using intelligent dimensioning processes to better control operating costs.

CHALLENGE

Reigning in CAPEX and future OPEX

After its nationwide launch of HSPA services, a Tier 1 operator faced the challenge of developing a standardized process for backhaul dimensioning and management.

The operator's existing backhaul dimensioning process forecasted increased data volume based on overestimated market growth, resulting in large amounts of under-used backhaul capacity. This translated to unnecessary CAPEX/OPEX expenditure on the transport network. Limited visibility into backhaul capacity on each site caused additional challenges.

Partnering with the operator's engineering team, Qualcomm ESG analyzed the situation and recommended a comprehensive backhaul monitoring and dimensioning process.

SOLUTION

Reduced CAPEX by $1.5M and OPEX by $18M

ESG collaborated with the operator's team for several months to understand their existing processes, identify potential deficiencies, and evaluate internal tools and automation frameworks.

The team's first priority was to accurately assess current capacity and actual backhaul usage. Available from UTRAN vendors, performance management (PM) counters typically provide useful information about backhaul and air interface use. Analyzing data from these PM counters, Qualcomm ESG developed a series

COMPANY

- Tier 1 operator
- Nationwide deployment of HSPA
- Project targeted a region of 18 major markets covering more than 7,500 sites

SITUATION

- **Inaccurate inventory and insufficient process to track backhaul resources**
- **Aggressive backhaul upgrade decisions due to an undeveloped process**
- **Unnecessary CAPEX / OPEX expenditures based on imprecise market projections**
- **Solution must support multiple UTRAN infrastructure equipment suppliers**

SOLUTION

- **Use existing UTRAN performance management counters**
- **Develop specialized backhaul capacity audit and usage reports**
- **Improve dimensioning process using detailed decision flows**
- **Recommend processes to streamline operator's internal tools**

RESULTS

- **Improved dimensioning process**
- **Reduced "over dimensioning" of backhaul resources**
- **Potential CAPEX savings of $1.5M and annual OPEX savings of $18M**

CASE STUDY

TRANSPORT NETWORK DESIGN

of customized reports for the operator. Separate reports were designed for determining deployed/in-use backhaul capacity; use of backhaul resources; voice and data activity on the Node-B served by backhaul resources; and other air interface performance measurements that could be impacted by the backhaul. The reports were incorporated into the operator's automation schedule, providing vital information weekly.

Qualcomm ESG leveraged the reports to perform a comprehensive study on key markets, comparing forecasted backhaul capacity requirements with actual network traffic.

This analysis yielded a step-by-step decision flow process for backhaul growth in the transport network (see Figure 1) that was streamlined and incorporated into the operator's automation framework.

Based on PM counters, the decision flow was designed to complement the operators existing processes that used market forecasts to determine data volume growth. The design added a second step in the process, making certain that capacity only increased when the current backhaul reached a specific threshold. Anomalies, such as an atypical subscriber "over consuming" data services, were easily identified and did not trigger expansion.

RESULTS

Collaborating with the Qualcomm team

The solutions developed by Qualcomm Corporate Engineering's ESG allowed the operator to refine its transport network capacity growth plans. The operator improved its backhaul monitoring and dimensioning process by correlating market-forecast growth with actual network traffic and quickly implementing a new decision processes to its automation framework. Customized reporting also provided visibility and easy access to network information, empowering the operator to make better operational decisions.

Analysis performed during this project resulted in an estimated $1.5M in CAPEX savings for the operator. An additional $18M in OPEX savings was achieved by estimating backhaul capacity more accurately to avoid unnecessary deployments (see Figure 2).

Figure 1: High-level Backhaul Dimensioning Process

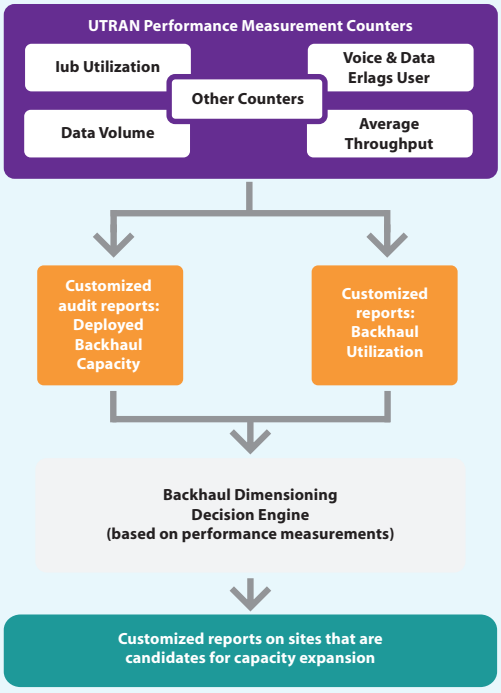
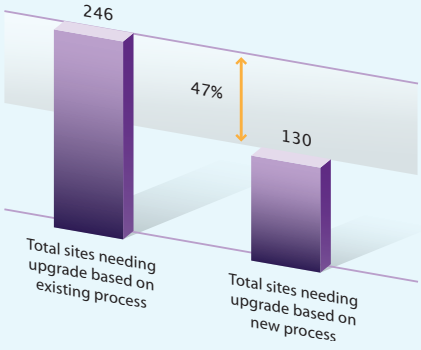


Figure 2: Backhaul Savings Example



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