Nokia Siemens Networks NetAct Optimizer

Executive summary

Nokia Siemens Networks

Managing complexity with automated measurement-based network optimization.

Executive summary

Improving quality of network

1. Reliable Data Services – Happy Customer

For most mobile users clear and reliable call connection at any location is one of the most important considerations when choosing an operator. A lack of reliable call connection can be challenging enough, as today's mobile telecommunication networks are complex by nature owing to the fact that multible network technologies are operational in parallel.

In addition to voice services, CSPs should be able to provide fast and reliable data services, and provisioning of new services should be near automated to fulfill end-users' expectations of high-quality service.

Nokia Siemens Networks NetAct Optimizer can help you to solve serious challenges faster and with reduced cost compared to manual work. In addition, it maximizes the usage of your existing assets as in the case of GSM frequencies into use for 3G data services without endangering the quality of GSM services.

1.1 How to cope up with coverage, capacity and quality demands

New data services, increased load, new network elements and technologies - just to mention few - are all examples of reasons why network settings need to be monitored and changed constantly to avoid disruptions in services.

Many CSPs are still doing these tasks manually and with legacy tools where proper interaction between tools requires customization work or manual transfer of data. Considering the operational lifetime of network, manual optimization can become a significant cost and resource issue. In a worst case, it can prevent launching new services on time or cause customer churn.

The complexity of today's networks requires optimization actions based on real-time performance data to ensure high quality of services and faster response times throughout the network. This is where Nokia Siemens Networks Optimizer can provide significant cost savings in replacing manual work.

1.2 Opportunities

With Nokia Siemens Networks Optimizer even months of manual work can be saved, apart from achieving significant network quality by improving any Key Performance Indicator.

Smart Communications in the Philippines recognized that maintaining service quality while handling rapidly growing network traffic was a pivotal challenge, and that network optimization held the key to delivering that quality.

“Three months of manual work is saved when we use Nokia Siemens Networks NetAct™ Optimizer, because manual frequency planning is difficult considering the number of BSCs to be optimized.”

Debbie M. Hu, Department Head, Nationwide Optimization Group and Metro Manila Operations, Smart

Smart:
Improved KPIs across the Metro Manilanetwork, including a 22% improvement in dropped call rates and 15% reduction in handover failures.

2. Building blocks of success

NetAct™ Optimizer is a key element in the Nokia Siemens Networks software portfolio designed to enhance the end-to-end performance of mobile services. Serving as stand-alone tool but also as fully OSS integrated optimization tool, it is also essential part of the NSN SON Suite, Self Organizing Networks delivering automated measurement-based optimization of operational GSM and WCDMA networks as well as for LTE networks. Optimizer includes close inter-working with other network management systems regardless of vendors.

NetAct Optimizer provides:

- Seamless support through the entire optimization process.
- Automated network data access and management.
- Effective visualization and analysis of actual network status.
- Measurement-based optimization for GSM, WCDMA, and LTE.
- Seamless optimization across technologies and vendors.
- Antenna tilt optimization.
- Call Location Analysis.

The optimization process focuses on the following key tasks:

- Frequency, BSIC and scrambling code allocation.
- Adjacency optimization.
- Capacity balancing for GPRS/EDGE and HSPA.
- Service quality control.

2.1 Cost efficient multi-vendor, multi-technology network optimization

Nokia Siemens Networks NetAct Optimizer combines current network settings and performance data acquired directly from network management systems, and automatically presents the information as detailed measurements. Geographical visualization is a powerful technique for presenting an overview of a large area, while table views present the relevant network details.

NetAct Optimizer carries out all these measurements automatically as per the operator requirements. This allows optimization experts to easily identify any problems and their causes, apply required policies, and choose appropriate corrective actions to improve the performance or capacity of the network.

Automated algorithms improve efficiency in handling large areas and complex problems. The optimization process is very cost-efficient, as all the network elements, regardless of vendor, can be handled seamlessly using the same process and tools. This approach also makes it possible to achieve efficient existing network capacity utilization.

3. Faster RoI

As an operator you can benefit from:

- Lower costs and lesser efforts needed to optimize mobile networks
- Management of the complexity introduced by technology and service evolution
- More revenue from invested network assets

“I would personally recommend the service using this efficient and effective tool to other operators if they ask me.”

Anton Perwira Putra,
Network Optimization Manager, Central Area, XL

Benefits for Excelcomindo

Excelcomindo gained following significant benefits with the help of NetAct Optimizer:

- Drive-testing has been eliminated, making RF optimization faster and more cost effective
- Optimization, which conventionally consumes three months time, took just seven days with NetAct Optimizer
- Operating expenses have been cut through automation

3.1 Service Optimization

Optimization is now mainly focused on managing service quality in multi-technology and multi-vendor networks. It involves moving beyond network element parameterization to analyzing and optimizing the range of mobile services in the network, regardless of network equipment manufacturer. The first step to service optimization is to ensure sufficient capacity for data services through network domains. NetAct Optimizer provides a means to achieve this efficiently since all the data is presented in a single solution. Bottlenecks and relationships in topology can easily be identified and resolved. NetAct Optimizer is one of the first products ever to analyze the content of data capacity in mobile networks. Service classes requiring guaranteed high bit rates can be prioritized using the radio network’s QoS mechanisms. Nokia NetAct Optimizer provides all this and much more, not just for Nokia Siemens Networks’ solutions but for any vendor mobile networks.

3.2 GSM optimization

The main capacity bottlenecks in GSM networks are related to poor utilization of band frequency. When delivering services that require a high data rate, it is essential to ensure an interference-free, good quality radio network. With NetAct Optimizer, the allocation process can be automated, making it an effortless and automated process.

NetAct Optimizer achieves its accuracy by taking interference measurements directly from the network, thus the performance of even a well-planned network can be improved. Interference matrix content can be analyzed before allocation. Interference related to antenna settings can be detected and resolved independently. The integrated allocation tool has a powerful world-class algorithm, specially designed for the needs of modern GSM networks. For example, it supports all frequency hopping types. Adjacency plan optimization is often useful prior to frequency allocation. In NetAct Optimizer, automated adjacency optimization is based on the same interference measurements.

3.3 WCDMA optimization

Developing a WCDMA network is becoming more challenging, as the load and range of services increase. Mobile subscribers expect very good service quality, seamless coverage and high mobility. A speedy and effective management process is therefore essential for WCDMA and joint networks. NetAct Optimizer increases understanding of the WCDMA network, thanks to its efficient visualization and analysis methods. For example, it is easy to detect rollout phase errors in topology, e.g. RNC or RAC areas, adjacencies and parameters. Further clarity is achieved by showing performance parameters and other KPIs in the same time frame, e.g. SHO with adjacency relations, coverage with accessibility details, or interference with capacity problems. In addition to analysis, NetAct Optimizer enables immediate correction of these settings. Adjacency optimization in WCDMA and WCDMA-GSM is one of the main challenges. NetAct Optimizer therefore provides a means of measurement-based optimization. It allows collection and analysis of adjacency level handover statistics and is able to compose optimal adjacency lists based on this information. The changes can be downloaded automatically onto the network with other network management system functionality

1.1.1 Extending 3G coverage with cost-efficient WCDMA frequency refarming

Eager to connect customers beyond city limits and take its 3G performance promise nationwide, Elisa Corporation, a leading Finnish communications service company, opted to go for Nokia Siemens Networks' WCDMA 900 solution.

"Conventional planning tools may not be optimal for refarming. The specialized optimization tool, NetAct Optimizer is reliable, fast and easy to use, and improves GSM planning in many cases where far fewer channels are available for GSM usage."

Vesa Orava, Network Manager, Elisa Corporation

“Rollout of WCDMA 900 can be really fast compared to WCDMA 2100. Based on our experience we can practically skip new site acquisition and building, and still get an excellent 3G coverage. From there on, it is primarily updating the rental contracts and refarming the 900 frequency band. Rental, electricity and transmission costs stay in check when you don’t have to add new BTS sites.”

Eetu Prieur, Head of Access Networks Planning and Optimization, Elisa Corporation.

3.4 Self Organizing Networks

NetAct Optimizer is a key component in NSN SON Suite for 2G, 3G and LTE networks. Optimizer for SON Suite provides both complete network wide and element level optimization for real time SON functions.

In any SON solution, it is the algorithms that determine the speed, intelligence and robustness. Another important aspect in automating the key network functions is the input data accuracy. In both counts, the Optimizer can teach a thing or two about true value and versatility. With proven record of fast Return on Investment and true algorithm excellence, Optimizer meets the most exacting standards and can be operated by only handful of people.

As part of SON offering for the rollouts, Optimizer have achieved clearly better performance than the manual and error-prone network optimizing methods. For instance the introduction of new cells to the radio network can be carried out in minutes rather than hours or days. While the traditional, prediction based optimization tools are often lacking the speed and statistical measurement accuracy, at best the whole network wide self-optimization takes only few days with this fully OSS integrated, multi-vendor capable SON Suite solution. With this solution, one can achieve 50% more rollout efficiency, network coverage and capacity optimization process.

4. NetAct Optimizer Automatic Frequency and Adjacency Tuning (AFAT) eases the optimization in a complex multi-vendor BSS environment

“Network quality is very important in maintaining subscribers and acquiring [new ones]. Nokia Siemens Networks NetAct Optimizer improves the performance of the whole network, no matter if it is from Nokia Siemens Networks or not. The [optimization] work efficiency has been improved a lot.”

– Mr Hou Wenjun Manager, Shanghai Unicom Optimization Department

Shanghai Unicom had challenges with complex radio environment due to fast growing city buildings, limited bandwidth and challenging frequency planning. In addition, they did not have mature frequency planning tool from other vendor to meet the requirement of GSM network quality improvement.

Nokia Siemens Networks solution was based on the use of NetAct Optimizer’s AFAT (Automatic Frequency & Adjacency Tuning) for NSN and Huawei BSS networks. Frequency changes were planned to be completed in three phases after careful investigation of network behavior:

- Frequency allocation method prepared based on systematic investigation on TRX configuration and bandwidth.
- Collection of traffic distribution and interference data from network.

Significant benefits Shanghai Unicom gained include:

- Visibility on accurate live traffic and interference data in spite of dynamically changing radio environment.
- Separate BCCH and TCH planning ensures the best trade-off between frequency utilization and network quality.
- Downlink and Uplink quality, and drop call were considerably improved in both Nokia Siemens Networks and Huawei areas.