OSS TORUS

SERVICE QUALITY & PERFORMANCE MANAGEMENT SYSTEM

A key to successful business: quality & performance

Leading telecom operators deliver wide spectrum of services, from voice communication and Internet access to multimedia content provision and multiple entertainment channels, which are multiplied up in volume, get more and more diverse, benefit from rapidly developing technology.

According to Nokia Siemens Networks 2013 report, quality of service is the most influential factor in choosing the operator. The customers are ready to pay more for the higher quality.

A successful business always strives to **improve the quality** of its services, reasoning from a clear comprehension that the profit, reputation, customers loyalty and the business growth are tightly bound to the quality. Consequently, there is a high demand for **continuous quality assessment** processes.
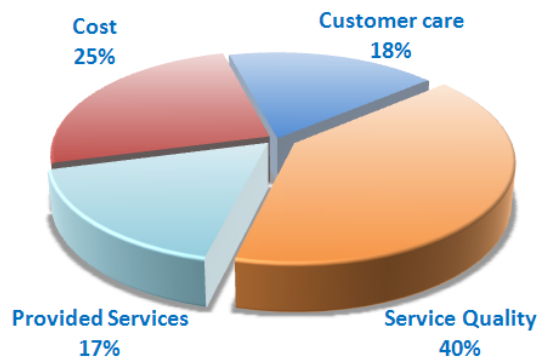

FIGURE 1. Factors affecting customers loyalty in russia (NSN, 2013)

The quality of service directly roots in network equipment: its performance and margin of safety. E.g., idle equipment typically indicates suboptimal resources load plan or chained denial of service (DoS) factor growth. No better is overloaded hardware, prone to failures which are followed by disconnections and data loss. As a result, the whole network manageability goes down. To mitigate these risks, the telecom operator has to **monitor equipment performance** uninterruptedly.

Performance monitoring and quality assessment processes are not cheap. The bigger the number of observed KPI/KQI is, the higher is the cost of due quality maintenance.
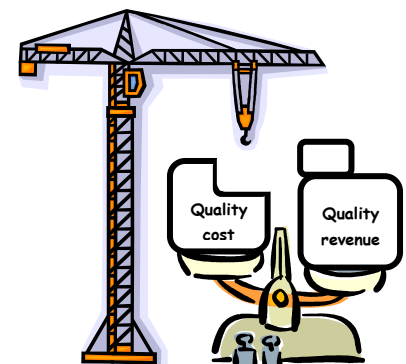
Networks do change concurrently: telecom companies gradually upgrade old equipment, introduce advanced devices, and increase the hardware base; network topology is getting more complex. Heterogeneous (by class, age, and vendor) hardware requires extra attention and version control. In that way, network development also impedes the formerly smooth calculation of quality indicators and delays the problems recognition.

These complications may arise from:
- **multi-vendor**, **multi-release** and **multi-technology** equipment being used simultaneously;
- lack of operational or configurational data collection from network equipment, or part of it;
- lost or delayed data, as well as data coming with uncertain reliability;
- multiple and mistimed data sources being combined in one formula;
- huge amounts of unsorted data for analysis;
- complexity of multi-step calculation of the key indicators.

GISware Integro presents a universal and powerful solution for Resource Performance Management and Service Quality Monitoring: OSS TORUS, which allows:
- **to consolidate** data;
- **to centralize** calculation methods;
- **to automate** the processes.

OSS TORUS BUSINESSWISE

TORUS is a third generation Operation Support System (OSS), which GISware Integro has been developing since 2002.

Together with our clients, we have solved thousands of issues in the quest for designing a powerful, flexible, and user-friendly OSS. Having accumulated the broad experience of our domain experts, system architects and developers, we are proud to offer TORUS as a perfect solution for quality assessment and a scalable toolset for a continuous network performance control.

OSS TORUS benefits:

1. **Revenue growth,** evolving from the customer loyalty which increases thanks to a better quality management and improved network performance.

2. **Cuts** in operational and capital expenses to maintain a high level of services quality, which are enabled by:
   - state-of-the-art transparency of processes;
   - high rate of service delivery problems prevention and minimization of incident response time;
   - integrated control of the entire network of telecom equipment and interfaces in between;
   - improved automation of planning, network optimization, traffic engineering and reporting;
   - inherent accumulation and reuse of engineers' expertise;
   - outstanding scalability of the system.

3. **Capitalization growth** as a result of business-critical solution deployment, which:
   - is easy to deploy, customize, use, and support;
   - obtains flexible architecture, adjustable to various business needs;
   - multiplies the efficiency of quality management department work;
   - successfully competes with the best solutions in the industry;
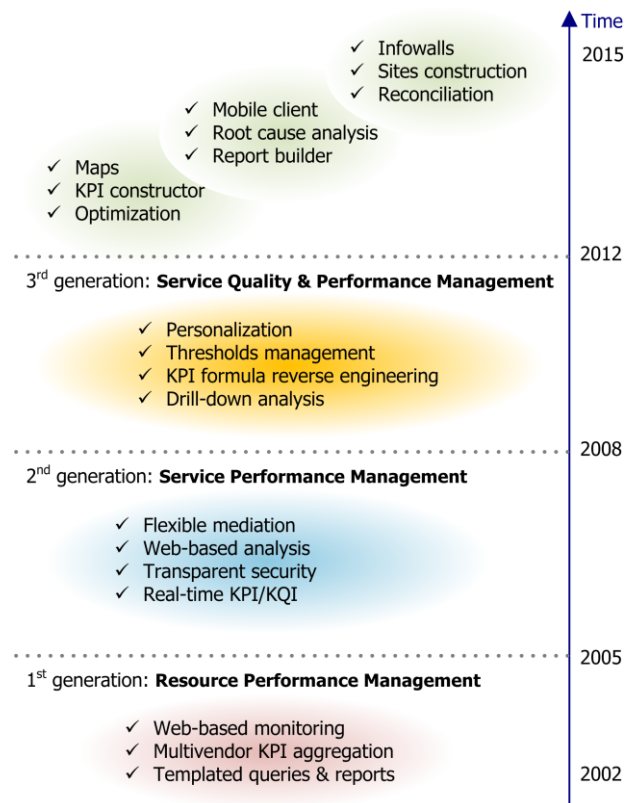   - is highly adaptive and simple to integrate with multiple standard telecom systems.

FIGURE 2. OSS TORUS EVOLUTION

FIGURE 3. ACR EFFECT ON TRAFFIC VOLUME, INTERNATIONAL DIRECTIONS

An apt illustration of **ROI** after OSS TORUS deployment is at Fig.3. Strong correlation between traffic and ACR (Answer Call Rate) was immediately revealed with the by-TORUS-managed indicators. Having that found, engineers monitored and controlled ACR, promptly eliminating the hardware problems. Within just one year ACR for international directions grew from 31,9% to 37,3%. Average call time of international calls showed a 56% growth, **ARPU significantly increased**.

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OSS TORUS technical fit

End users will see OSS TORUS as a web interface gateway to a consolidated warehouse of all available statistical, configurational, and computational data collected from the telecom operator network equipment. Their roles secundum, end users successfully employ OSS TORUS as a data analysis tool in the following areas:

- on-line monitoring of quality of service (KQI values);
- on-line monitoring of network equipment performance (KPI values);
- control over the load level of multiple network element types: cells, signaling links, trunk groups, MSC, MGW, HLR, MMS-C, SMS-C, RTBS, BSC, RNC, Node B, etc.;
- planning and optimization of radio access network, network capacity calculation, etc.;
- analysis and prediction of network load index, including peak hours;
- control over network reconfiguration and hardware roll-out;
- drilling down the root causes of network-related incidents, ranging from disconnections and drops of packet traffic to human errors;
- processing the equipment state history for cooperation with the vendor;
- any level reporting: from single cells and controllers to the company as a whole, including monthly operational reports.
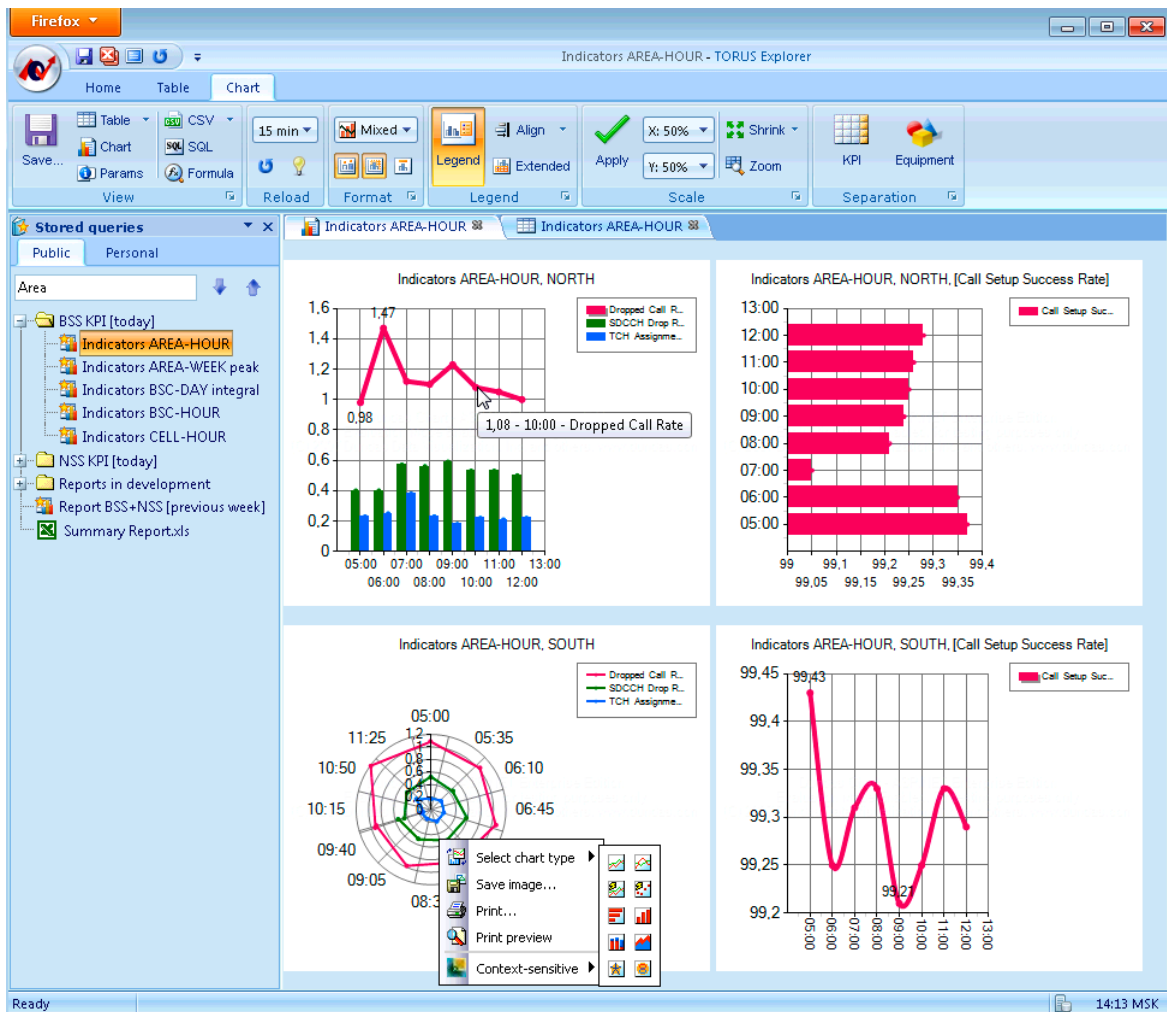

FIGURE 4. NETWORK LOAD CHARTS, WEB CLIENT

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OSS TORUS FEATURES

OSS TORUS is based upon a flexible distributed data mediation device architecture, multipurpose web client and a powerful MetaDB™ core concept, with Oracle RDBMS underlying. Advanced and flexible architecture makes TORUS applicable in a wide range of ICT business segments.

Key OSS TORUS features:
- lightweight cross-browser web client able to operate huge data volumes;
- adjustable graphical and sound alarming;
- rich data analysis means with grids and charts;
- teamwork tools for creation, storage, and publication of user-defined sharable queries and preset charts;
- reliable role-based authorization of web users, with support for SSL and NTLM;
- flexible SMS and e-mail notification scheme;
- scheduled and real time KPI/KQI calculus engine, with intelligent processing of streamed data and delayed data;
- calculation of indicators, using inheritance and dependency tracking mechanisms;
- consolidated storage of all collected data in a central database;
- secured data access via Oracle Virtual Private Database technology;
- storing configuration and state history for each unit of equipment;
- MetaDB™ — a universal automated mechanism for data structure management;
- customizable background archiving of out-of-use data;
- automated registration of new equipment instances and support of test equipment;
- flexible scripting mechanism for parsing collected data of any structure.

Besides that, OSS TORUS offers the following advantages essential to telecom business:
- native operation support of multi-vendor and multi-release networks of any topology;
- equipment support libraries for 20+ telecom vendors;
- resource saving scalability, accommodating the growth of network, data flow, or number of users;
- control over data completeness and calculations reliability, with respect to continuous or one-off network development;
- auto-extraction, visualization, and editing of KPI/KQI formulas;
- regular and customized KPI/KQI thresholds;
- tools for drill-down data analysis, from aggregated KQIs to raw statistic counters;
- special data aggregation modes for the peak hours;
- support of the basic data collection and exchange protocols;
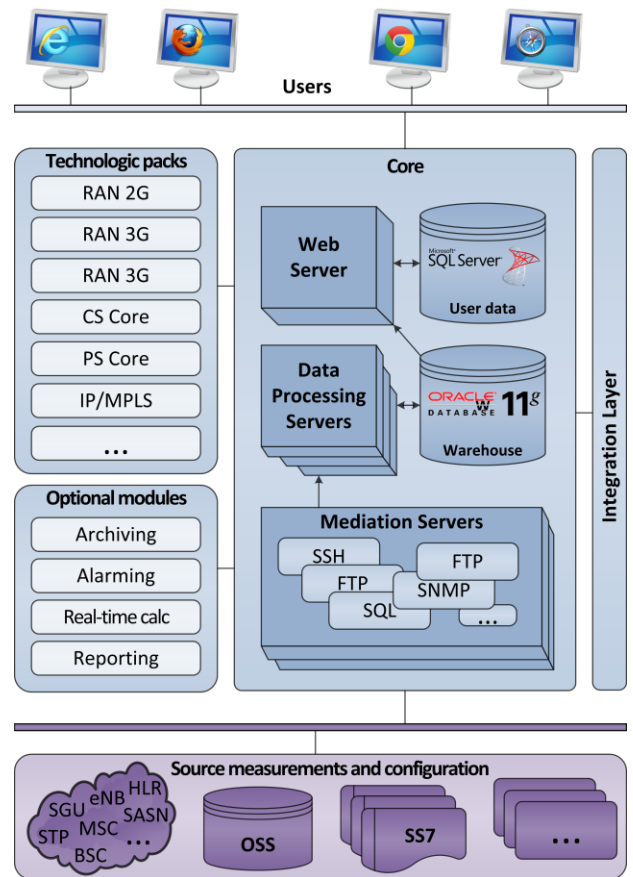- conformity with telecom industry standards.

FIGURE 5. OSS TORUS ARCHITECTURE

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SUCCESS STORY: VIMPELCOM

A second generation of OSS TORUS (under the project name "IS GLOBUS") was successfully deployed in 2006-07 at VimpelCom, the third largest (57 million subscribers) telecommunication operator in Russia (trademark: Beeline, NYSE: VIP). OSS TORUS was chosen over a number of commercial Performance Management solutions after a meticulous comparative analysis considering the following criteria:

- total cost of ownership, including cost of deployment, operation, support, and tailoring;
- system maintenance quality and manufacturer's response speed;
- OSS scalability upon moderate hardware requirements;
- data model universality and adaptability for any data source;
- possibility for the end user to review KPI/KQI formulas and to optimize calculi thereof on his own;
- ability of flexible and cost-cutting integration into VimpelCom IT infrastructure.

The similar analysis was taken later in 2010 and the choice of IS GLOBUS was reconfirmed, due to outstanding **performance**, precise **reliability** of data collection and KPI/KQI calculation, and **efficient low-cost support**. Unofficially, the system is now called the "corporate quality standard in IT".

Within just two years after deployment IS GLOBUS allowed:

- to organize centralized and highly manageable routine of data collection and data processing for more than 40 network element types (MSC, BSC, RTBS, RRL, etc.) from various vendors (Alcatel, Checkpoint, Cisco, Comverse, Ericsson, Huawei, Motorola, Nokia, Siemens, etc.);
- to deliver 24x7 monitoring of quality of services for entire network, or any part of it;
- to significantly reduce employees' office hours spent on KPI calculation, root cause analysis, network planning, and reporting;
- to reduce a time span required for problem recognition and investigation by 4,1 times in average;
- to ensure control over SLA observation by through-line operators;
- to maintain network quality during equipment roll-out or reconfiguration;
- to analyze the trends of network development and utilization of equipment;
- to provide personnel with variety of reports on network behavior promptly.

In the next years, lots of new functions have been added; numerous extra network equipment was plugged in; integration with umbrella fault management, inventory, and radio planning systems was successfully provided.

VimpelCom had initially requested a 8 GB/day bandwidth of the system. After four years of intense use, IS GLOBUS easily copes with the real time data flow which **grew up twentyfold** (150 GB/day, 400.000.000 of rows/day). System responsiveness and calculation performance were kept in shape, with a very modest outlay for the hardware.

At present time, OSS TORUS (IS GLOBUS) is a business critical vertebra in VimpelCom IT backbone, intensively used both in the head office and in the local offices, meeting the daily needs of monitoring and traffic engineering departments, network planning and optimization departments, marketing and quality assurance specialists, let alone top management.