

Common Service Monitoring Engine is the heart
of Next Generation Service Assurance

How to move Service Assurance to the Next Level



Comarch Headquarters

Al. Jana Pawła II 39 a
31-864 Krakow

Poland

phone: +48 12 64 61 000

fax: +48 12 64 61 100

e-mail: info@comarch.com

www.telecommunication.comarch.com

www.comarch.com www.comarch.pl www.comarch.de www.comarch.ru

ComArch Spółka Akcyjna with its registered seat in Kraków at Aleja Jana Pawła II 39 A, entered in the National Court Register kept by the District Court for Kraków-Śródmieście in Kraków, the 11th Commercial Division of the National Court Register under no. KRS 000057567. The share capital amounts to 7,960,596.00 zł. The share capital was fully paid, NIP 677 - 00 - 65 - 406
Copyright © Comarch 2008. All Rights Reserved.

EN-2008.05

Introduction..... 3

The challenges of Next Generation Networks..... 3

How to design the ultimate solution..... 5

Benefits..... 6

What to look for in Service Assurance Solution 7

How it works in real life..... 7

Comarch offer and vision 9

Comarch Advantage..... 9

Introduction

Delivering services to the customer is the lifeblood of an operators business. When offered services are maintained, with quality fulfilling the SLA agreements, modified constantly according to the markets needs and new ones are activated quickly - the business succeeds. However, when the service management is poor, service outages caused by network failures happen frequently and the resolution process is slow; customer experience is not inline with its expectations. Evolution of telecommunication networks causes us to see new services emerging everyday, their number and complexity is rapidly growing; simultaneously service lifecycles are getting shorter.

How can operators ensure the proper quality of so many such complex services delivered? Fortunately, operational supporting systems are evolving together with operator's businesses. The growing number of services means that OSS systems have never been as important as they are nowadays. Today, operators can not even think about delivering modern services with good quality without significant help from the supporting systems. That also means that Service Assurance becomes the most critical area of modern OSS solutions.

This white paper will review emerging trends in service management and examine the benefits of Next Generation Service Assurance concept.

The challenges of Next Generation Networks

The changes that occurred in the telecommunication market over the last decade and the transition to NGN networks that happen nowadays have increased competitiveness in the telecommunication market, forcing all the operators to optimize their costs and make their offered services much more attractive for end customers. However, this optimization can not be achieved using the previous generation of OSS systems. The move from traditional architecture into a next-generation telecommunications network introduces additional problems into network management and operations. The introduction of multi-layer network architecture simplifies the development and introduction of advanced services, e.g. providing connectivity as a network layer service as in IMS, but hides the complex relationship between the services provided and the network resources used. In simple words, Next Generation Networks require Next Generation Service Assurance to fully protect the services delivered to the customer and conserve operators' revenues.

In traditional architecture, the provided services were embedded in the networking equipment. Analysis of the service state was easy and straightforward. In modern networks however, services are no longer associated with a single device in the network. Instead, each service is composed from resources provided by many devices operating within the network or even based on many other simpler services offered by third party companies. With more advanced services offered, the structure of these services can become more and more complicated.

In the case of any failure in such a complex mesh of connected resources and suppliers, quantity and importance of the affected services usually determine the severity of the network failure. Therefore, in a next generation network, exact information about the service state is essential for network management and operation.

Let's see this problem in an example. Imagine the telephone switch in the old-fashioned network encountered a failure. The old-fashioned network manual identification of affected customers and services was quite feasible: simply all customers directly connected to the affected ports were cut off from the voice service. In a next generation network, the relationship between the equipment and the provided services is much less straightforward. In the case of an edge router failure, it is not a simple task to determine which services are affected by this failure. Services offered over an IP network can vary, from basic residential Internet access, to highly critical IP VPN for enterprise customers. Since these services are not provided directly by the edge router itself, it is usually difficult to quickly determine the set of affected services. As these are the services that are sold directly to the subscriber, the quantity and importance of the affected services usually determines the severity of the network failure. Therefore, in a next generation network, exact information about the service state is essential for network management and operation. With more advanced services offered, the structure of services can become even more complicated.

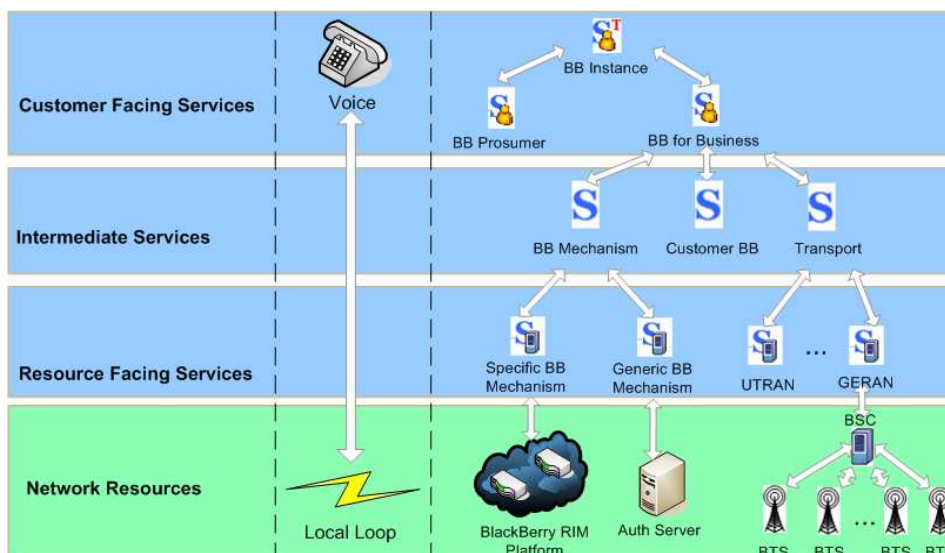


Figure 1. Evolution of services. Left panel presents old-fashioned simple voice service with direct mapping between resources and customer-faced services. Right panel contains a part of a model of modern Blackberry service, with complex mesh of resources and resource-facing services the Blackberry for customer is based on.

Nowadays, also gathering the information about the failure is difficult. The event can be an alarm collected directly from network element or network management system, end-to-end probe, third party SLA monitoring engine, but also a Trouble Ticket generated by a call center or information from the customer self-care system. What's better is that these different sources can report altogether about the same outage, every one in its own way! This means that we need an advanced logic to find and present clear information for network and services maintenance staff as well as a set of standardized interfaces to inter-connect all parts of the Service Assurance system.

However, delivering precise information about the customers and services affected by a failure is only one part of modern Service Assurance; the other is to improve the process of finding the root cause of events to an operator's staff. Supporting the engineers in fast location of the fault source is crucial for an operators business. The later the reason of a failure would be identified the bigger the losses it will cause. Here we come to another challenge - Next Generation Service Assurance should not only

provide visibility of service states even with failure root cause analysis, but a comprehensive solution should also proactively support the process of incident resolution to speed-up the service recovery – minimizing losses. When it comes to fixing even hundreds of outages (planned and unplanned) per day with complex services based on a mesh of resources, with divided staff competencies and responsibilities, often partially outsourced, doing it in an organized, optimal way with proper prioritization of performed actions, without any help from an OSS system seems to be very hard or even an impossible task.

We can point out the most crucial challenges for NGS solution:

- providing actual information about huge number of services with complex structure and resource dependencies
- offering a clear and coherent presentation and analysis of events gathered from multiple classes of sources
- organization and automatization of incident resolution process.

Summarizing, the huge number of services with a complex structure and intricate mapping on the resources, which is essential for operator's business growth, lays a duty on the OSS system to give a clear visibility of the service and easy service control and governance and last, but not least, optimal and automated business process management.

How to design the ultimate solution

To overcome the challenges of Next Generation Networks an operator needs a comprehensive Operational Support System providing a permanent opportunity to model and monitor complex services based on the underlying network resources. Progressive Fault Management module with advanced event processing and enrichment should be a main event source. Standard and common interfaces to external systems (e.g. Trouble Ticketing, Customer Care, SLA Management, E2E probes) should give the ability to collect events and information for alarm enrichment from non-network sources. By taking a closer look at the telecommunication market we can see that the best strategy is choosing interfaces founded on OSS/J initiative, which seems to become a 'de facto' OSS interfacing standard. Such an expanded system needs an efficient correlation engine to support the presentation of the most relevant information regarding upcoming events in an automated way, as well as to implement advanced logic to support the network engineers in root cause analysis. Automatic business impact analysis on the basis of information about possible SLA violations, affected customer importance, failures in rush-hours etc. should also be performed during the event enrichment process and incident creation. To deal with emerging incidents, a process management system controlling and organizing complex workflow is also crucial. To structurize the business process it is very convenient to use workflows based on best practices described in ITIL and eTOM recommendations. The knowledge gained during hundreds of failure fixing related tasks should be stored in Know-How Database to improve and speed-up the solution finding for next, similar cases. In modern business models many maintenance tasks are outsourced so there is a strong need to include highly configurable Web Interface for presenting dashboards or simple task panels for external partner companies. Service Assurance should also have control of Service Level Agreement fulfillment and direct communication with the customer, such as through Trouble Ticketing.

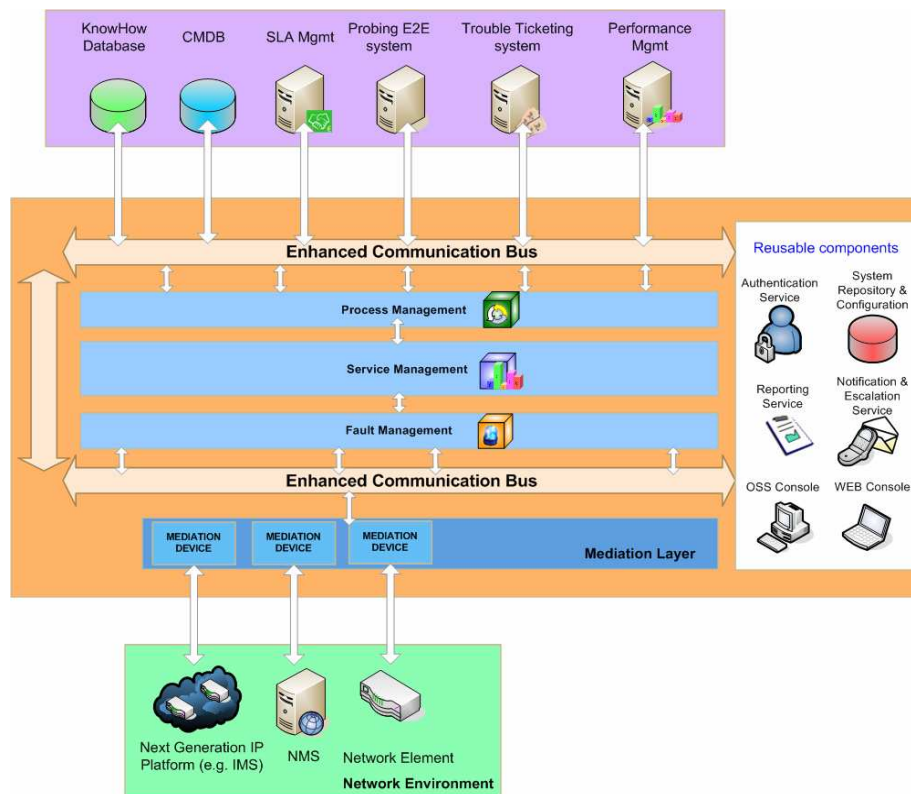


Figure 2. Solution architecture. Schematic architecture of proposed Next Generation Service Assurance system.

Benefits

Using the solution described above, we are able to provide instant and comprehensive assurance of offered services. The wide range of gathered events and an advanced logic to process them automatically shortens the time of failure root cause analysis and combined with workflow system speeds-up the incident resolution process. That simplifies the network staff every-day activities, make their effort more effective and in customer perspective provide more reliable services offered with higher QoS. Automatic business impact analysis giving task prioritization prevents most important SLA violations, protect VIP customers etc. reducing the potential losses. The open interfaces strategy makes the solution more flexible also in perspective of further growth and development. The analysis of processes related to the assurance of typical services shows that the majority of human tasks resulted from data fragmentation and redundancy between all the systems involved in the end-to-end process.

The integration of process management engine with OSS Solution and foundation of predefined processed on well-documented and preconfigured workflows based on the ITIL recommendation, organized in the skeleton of the eTOM framework, optimizes the human and network resource usage reducing the redundancies and ineffectiveness. Having a library of executable workflows mapped on the eTOM process framework and a ready to deploy SID based data model, it is possible to quickly address a chosen eTOM area by building a mesh of coupled workflows operating on event data. The added value can be a redefinition of business processes in the company, on the base of ITIL knowledge and best practises to make them more effective and reduce unnecessary costs.

Using the available automations in incident or problem process handling it is possible to exclude human interaction by 60% on average. Considering that each human task involves a long and unpredictable pending period, execution of the process can be greatly improved even from several hours or days to either minutes or seconds.

This optimization together with a Know-How Database repository allows the network staff to operate efficiently and quickly, keeping the business away from unnecessary losses.

What to look for in Service Assurance Solution

When looking for a next generation service assurance solution, you should be sure to consider the following elements:

- Comprehensive service modeling and monitoring engine, providing the mapping between resources and services even for complex cases, it should be the heart of Next Generation Service Assurance.
- Progressive fault management system, including advanced event enrichment (with use of information from external systems) and strong correlation engine to assure clear data presentation and root cause analysis.
- Automatic business impact analysis giving task prioritization related to business (e.g. SLA) information.
- Standard OSS/J based interfaces to external systems giving you the ability to collect events and information from non-network sources, as well as protecting the system growth possibilities.
- Process management system controlling and organizing the complex workflow in the areas of Incident and Problem Management, equipped with predefined ITIL and eTOM founded process templates and enabling the task automation.
- Web GUI dashboards and panels with highly configurable content restrictions for external partners use.
- Know-How Database to gather and store the knowledge, tips, solutions and all necessary wisdom about the devices, services and procedures related with service assurance in your business case.
- The ability of a solution provider to adapt and customize the off-the-shelf solution according to your company particular needs, not everything that is convenient for other companies is suitable for you.
- Choose a stable, well-experienced solution provider with at least 10 years of experience in the OSS market, a member of international organizations and forums like TMF, ETSI etc. this assures you that the supplier knows and tracks the changes in the IT world and is following new concepts and ideas.

How it works in real life

Now let's focus on one simple example of how such a solution works in real life. Consider that the situation on the physical path between two SDH switches was broken. Assume this link provides the connection between BSC nodes and MSC. First, ports in SDH switches reports alarms 'port down' to

the fault management system, while after all BSC and BTS related to them send 'MSC connection lost' events...then all mobile based services (e.g. voice, sms, GPRS, HSDPA, Blackberry, etc.) in this geographical area start to raise an alarm 'service unavailable'. What's more the probes systems also reports link failures. The real flood of events appears (and that is the beginning – after a few minutes the customer will start to complain to the call center – the Trouble Tickets emerge). The correlation engine analyze the upcoming events and enriches them with information from external sources e.g. calculates the event impact on business (SLA violation threat, affected customer amounts etc.). To clean the mess and present the Network Operator Center engineer clear information the correlation logic decides to raise new 'virtual' root-cause alarm – 'link down' and to correlate all alarms caused by link failure to the root cause. On the NOC operator screen appears only the root cause alarm with information about all affected services, opened trouble tickets and with possibility to drill down for other related events. The NOC staff member after short situation analysis decides to start the incident process and passes the task to an Incident Manager who does further investigation of failure reasons and losses using system tools (e.g. Known-Error Database) and views and decides about the incident resolving method. According to specific situation the appropriate solution is chosen (device reconfiguration, repair, change, attachment to Problem Process etc.) and if necessary the next task is assigned to field staff – operating on the Web Console with access to information restricted only to particular activity.

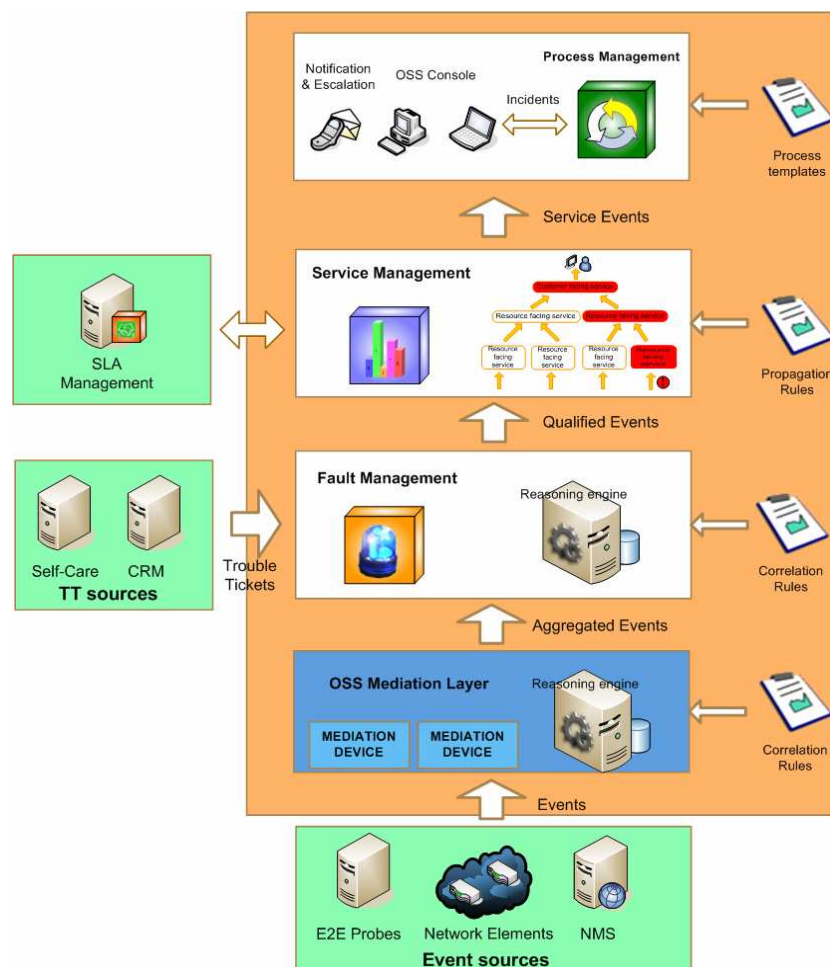


Figure 3. Event propagation. A scheme of event processing from 'rare' event coming from network elements or systems, through correlation and enrichments stages, up to service monitoring and incident handling layers.

The failure fixing notified by field staff is automatically verified by the system (event list updates and analyses) and when positive the Incident Manager closes the process with automatically notification to all related departments (NOC, Call Center etc.). All the information about incident raise and its resolution is passed to historical repositories for further use in statistical reporting or optimization reasons, also if applicable the Know-How Database is also updated.

As we can see all the process from start to end was controlled automatically by the NGS system with the space for human interaction only in critical governance and decision parts.

Comarch offer and vision

Our proposal is Comarch Next Generation Service Assurance, based on the Comarch OSS Suite 4 modules: Service Management, Fault Management and OSS Process Management. Providing the ability, through a very efficient event correlation system, to monitor complex services, find a problem's root causes in an automated way, enrich events with advanced information e.g. incident business impact calculated with use of external systems information and most importantly, resolve incidents through structured processes modeled in the OSS Process Management module which is specifically designed for managing a Telco operator's processes. It provides several mechanisms and tools which enables process automation at different levels. Each typical common task can be defined on the highest level as an automatic process. Finally, Process Management provides a scripting mechanism to define actions even at the atomic level and use them in high level processes as automatic tasks. OSS Process Management comes with a large amount of preconfigured workflows based on the ITIL best practices. It also contains automation patterns operating on a predefined data model based on SID. A Know-How Database integrated with the Process Management system provides additional added value and Web GUI enables the possibility of configuring dashboards or panels for use by external party partners. Seamless integration of all the components of the Comarch solution with 3rd party software, through OSS/J interfaces, delivers an OSS system which enables Service Assurance to be controlled from one convergent application.

In conclusion, every day we have to deal with new emerging services with steadily increasing service complexity. This situation introduces new requirements for Operations Support Systems. Only tools that are service and process oriented with highly automated incident and problem management are able to help an operator manage this live environment of resources, services, customers and partners.

Comarch Advantage

Comarch is a global IT business solutions provider specializing in forging client relationships to maximize customers' profitability and optimizing operations and business processes. Comarch primary advantage lies in huge domain knowledge accumulated in our software products which we use to deliver and integrate sophisticated business IT solutions.

Comarch has been awarded an impressive number of contracts owing to the company's cutting-edge technology, broad knowledge of specific vertical markets, and refined sense of responsibility. Comarch boasts the execution of over 2000 complex IT projects and the implementation of our software in more than 40 thousand companies worldwide. It is a source of great pride that many of our international and

prospective clients and analysts regard Comarch as the strongest Eastern European Company to have entered the global IT market.

Comarch reinvests more than 10 million Euros annually in Research and Development to support the enhancement of existing products as well as new generation products development. Comarch also organizes comprehensive technology programs involving our consultants, analysts and customers to ensure our technological aspirations are completely aligned with current and future market expectations. Our product strategy conforms to quality management policy that is expressed in the recognized CMM model certificates and top level ISO certificates.

In various rankings Comarch is recognized as one of the top five producers of BSS and OSS systems for telecommunications. Comarch products are used by Telecommunication Operators from over twenty countries.

We would like to draw your attention to the following unique features of our offer:

- Comarch is a stable, organically growing company with organically growing business and increasing number of customers throughout the World, our main centres for Western Europe are located in Dresden and Frankfurt on the Main, Germany.
- We are really focused on our clients' needs, telecom operators are strategic and one of the most important clients for us.
- Comarch is a knowledge based company, we invest 15% of our revenues back in R&D,
- Comarch is a publicly held company, that's why it's fully transparent,
- Our 15 years of experience in OSS and membership in the TM Forum guarantees you a safe decision and a best of the art OSS solution,
- During our cooperation with global companies we have proven our effectiveness in a large IT projects and ability to work in a multinational environment, our products are seen as a world-class solutions.

To begin the first steps toward Next Generation Service Assurance in your business please contact us at info@comarch.com.

Jakub Meisner
OSS Consultant
Comarch SA