



# MTS – Case Study

## Next Generation Service Assurance

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November 2012



## Main causes of the project

### Business driven causes:

- Development and implementation of a system for the customer services quality measurement and control
- To provide subscribers the services with guaranteed quality (SLA)



## Main causes of the project

### Technical driven causes

- Decentralized monitoring structure
  - Each MR had specific structure and division of responsibilities
  - OSS systems landscape differed between MR (lack of standarization, dificult to maintain)
  - No common approach to network monitoring
- Operators wasted their time for routine tasks
  - Lack of automation
  - Lot of time wasted for the management of alarms that are not important
  - Operators had to use additional systems to get information about resources, hardware, connection, alarms, actual state of the resource, other vendor specific data, etc.

## Main goals of the project

- Unification of OSS landscape
  - Transformation from existing legacy, silos based OSS systems to the NGOSS environment
  - The implementation of unified umbrella solution in assurance area above different NEM/EMS systems distributed over the whole Russia
  - The introduction of Service layer and the definition of dependencies on the network layer
  - Standardize and minimize the amount of alarms
  - Ensure the correct performance of the network and delivery of sold services
- OSS organizational structure transformation
  - Centralization of network monitoring
  - Establishment of new processes
  - Establishment of new positions
  - Reorganization of working groups



## Desired NGSА Operational Capabilities

- No service affecting event will remain undetected
- Impact of events on services and customers will be known
- Customers can be informed proactively
- KPIs relevant for SLAs are monitored
- Trends jeopardizing SLAs are analyzed
- Reporting provides relevant information for continuous improvement
- A high percentage of incidents is detected before customers call
- Planned changes can be simulated, potential impact can be predicted
- Everybody (according to his role) can see if an incident is being worked on
- Root cause analysis points at least to the correct domain of responsibility
- Everybody (according to his role) can see if an element is being worked on

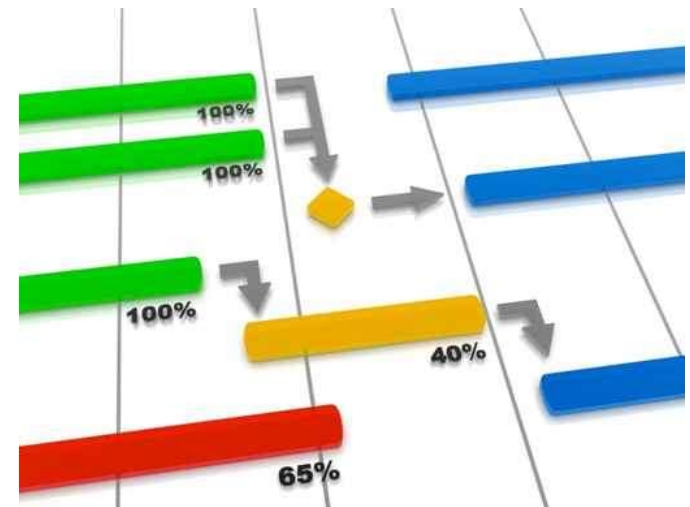




## Scope of NGSА project

Convergent solution based on the following modules:

- Comarch Next Generation Service Assurance (NGSA),
  - Fault Management
  - Service Monitoring
  - OSS Process Management
- Comarch Service Inventory (SI),
- Comarch SLA Monitoring (SLAM),



Comarch's responsibility:

- the analysis and implementation of above modules
- consulting services in order to centralize network operation
- participation in the process of defining the concept of centralized NOC as well as in the realization process



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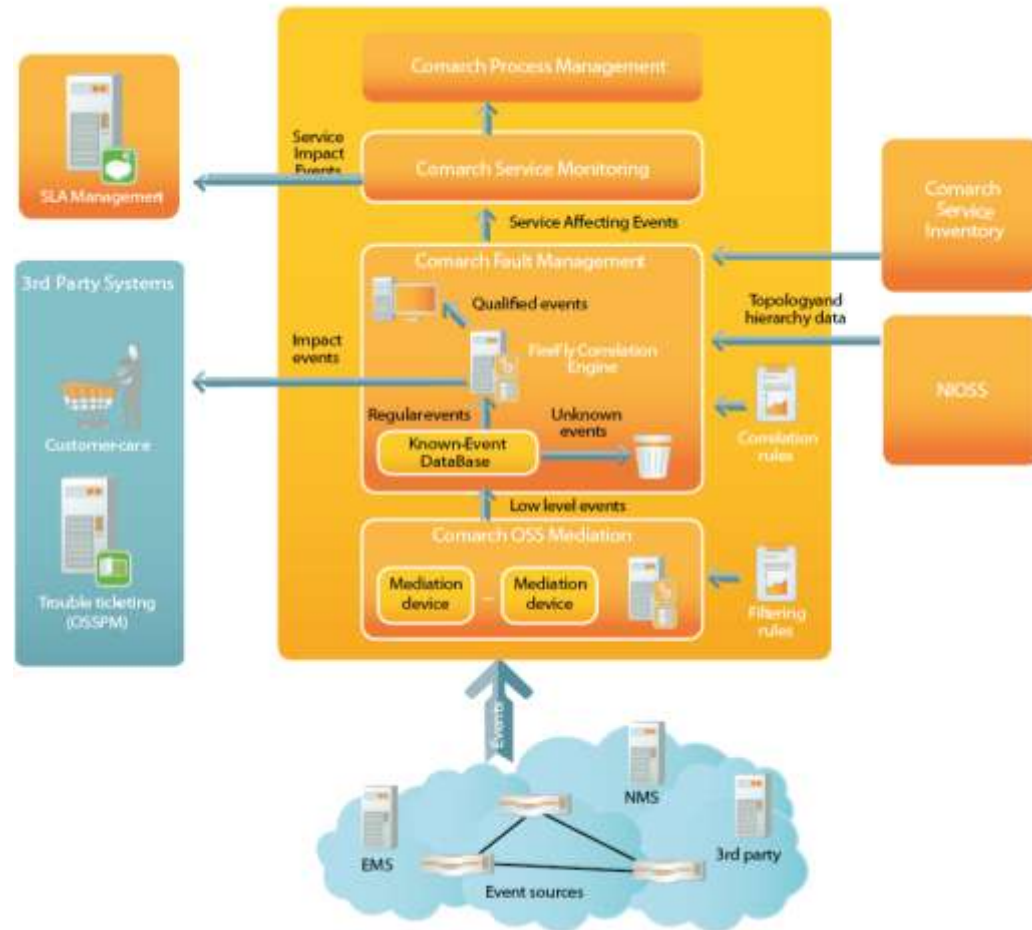
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## NGSA functionality highlights

- **Connects** to event data sources/systems to **extract** FM data
- Transforms **Low Level Events** into **Qualified** events that can be presented to the operator
  - with the usage of **KEDB** and **correlation rules**
- Propagates events in the service trees and calculates **Service Impact**
  - with the usage of **service models** and **resource data**
  - also imported from external systems (Inventory)
- **Manages** operational processes (ITIL-based)
  - may also integrate with external **TT and SLA** systems

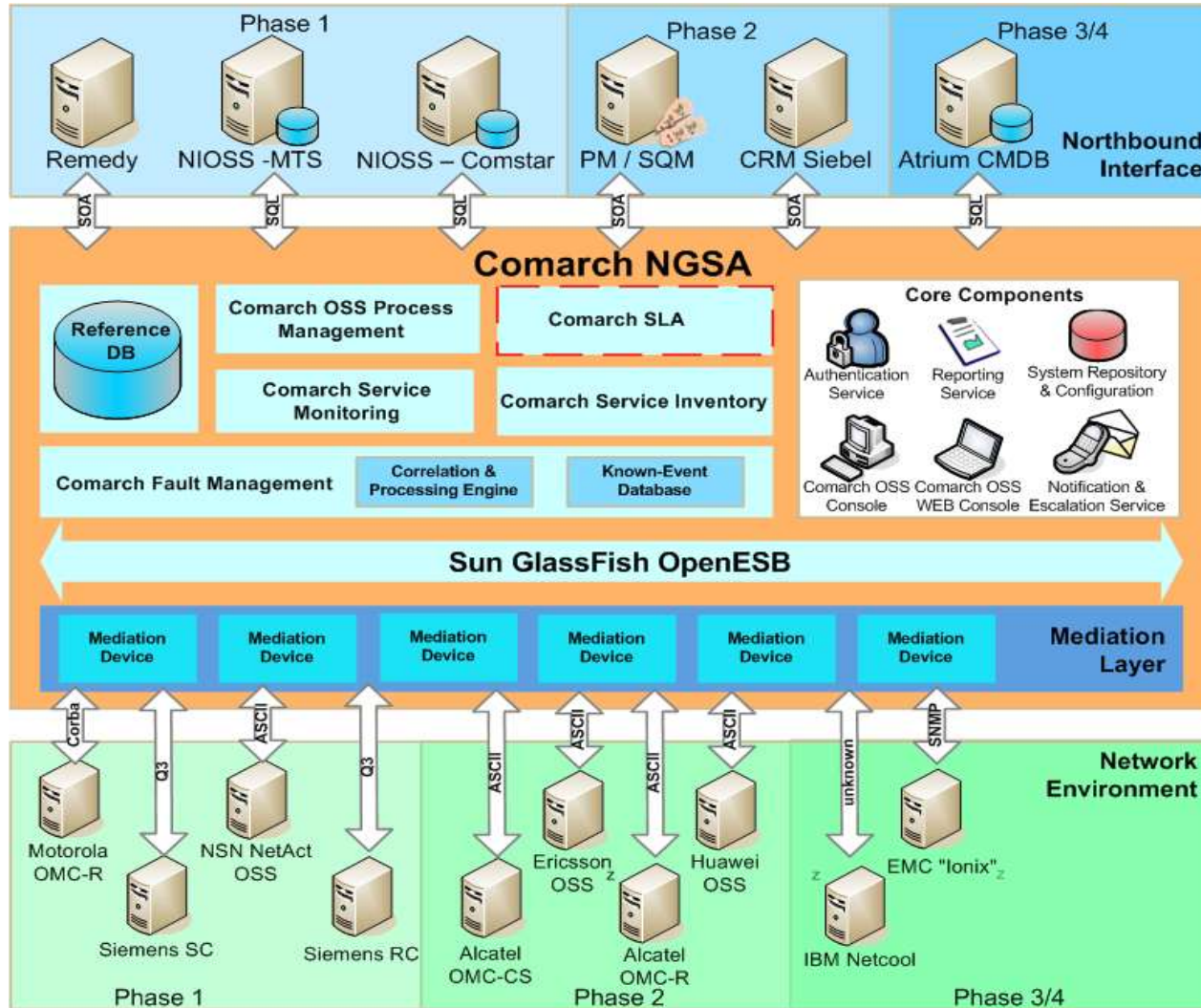


## Event flow



- High level of **automation**
- **Efficient** event correlation engine
- **Very good performance** assured by a number of mechanisms for events filtering
- **Standard interfaces** like SNMP,
- and other for event gathering
- Integrated **business process engine**

## NG OSS Target Architecture





## NGSA Project time frame

Project start date: 2011-04-18

Phase	Date of implementation RfA	Subject of implementation	Interfaces	Funcionality acquired
Phase 1	2011.09	NGSA + SI for MR Moscow	Siemens SCR, Motorola OMC-R, NSN NetAct	Basic functionality of NGSA for Macro Region Moscow
Release 1.1	2011.12	Extension to MR Central, MR South	Ericcson OSS, Siemens RC, Comstar XMSG	Extended monitoring area
Phase 2	2012.02	Extension to MR North-West, MR Volga	Huawei OSS, Alcatel OMC-R	Extended monitoring area
Phase 3	2012.03	All functionality needed for GNOC	Extended Services, GEO view, GIS WMS	All functionality needed for GNOC
Phase 4	2012.06	System configured for all MacroRegions	All interfaces configured for all Macro Regions (incl Asian part)	Additional features

Main Project end date: 2012-08-31



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## Summary of NGSA Project Results

- ~300,000 network elements being monitored
- 14 types of alarm sources integrated with NGSA
- 38 alarm source instances connected to NGSA
- >100 alarms per second gathered on average
- ~60% reduction in the number of alarms presented to operators
- >60 concurrent users of the NGSA Console

## GNOC – step by step approach

- GNOC – initial configuration
  - Infrastructure ready
  - Required staff ready
  - predefine views configured
  - Communication processes defined
- GNOC first handover (MR South)
  - Monitoring of first event sources (Ericsson and Siemens) using NGSA
    - Dayshift – support from local NOC
    - Nightshift – no support from local NOC
- GNOC – full responsibility for first MR
  - Whole monitoring tasks moved to GNOC
- GNOC – next handovers (one after another)
  - Handover **without** new interfaces types
  - Handover **with** new interfaces types



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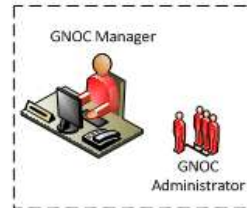
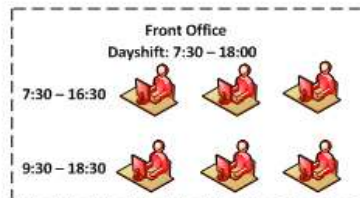
## Current monitoring status

- MR Moscow: monitored by Moscow team
- MR Central: monitored by NSN & Moscow team
- MR South: fully monitored by GNOC
- MR North West: fully monitored by GNOC
- MR Volga: fully monitored by GNOC
- MR Ural: Core is fully monitored by GNOC, RAN – local MR team
- MR Siberia: fully monitored by GNOC
- MR Far East: fully monitored by GNOC



## GNOC organization

### GNOC Structure



Dayshifts:



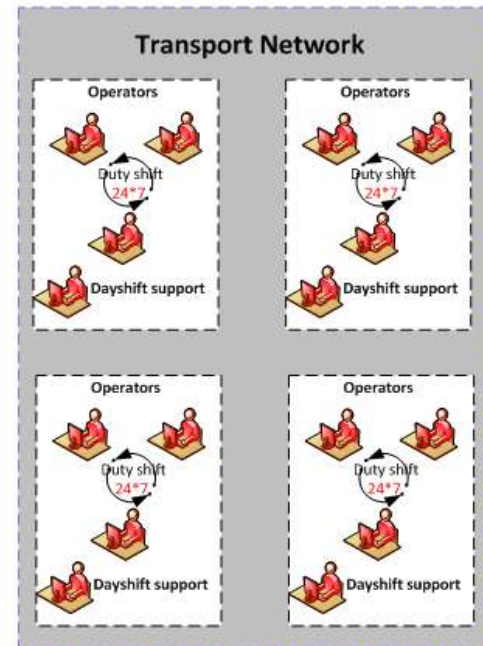
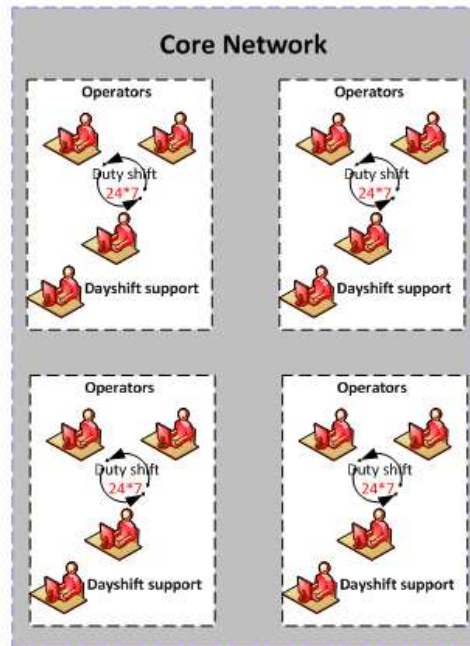
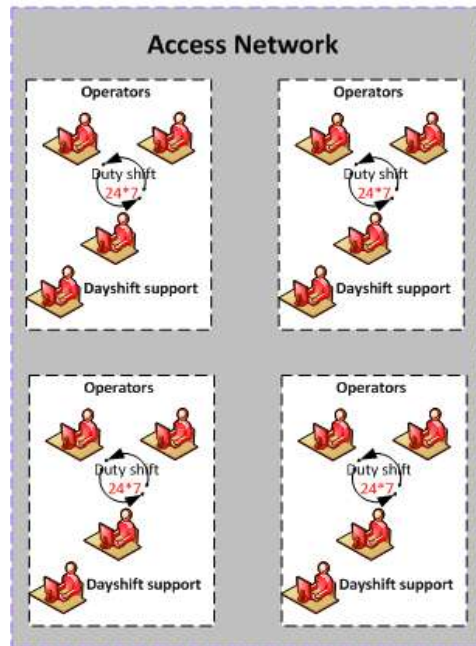
KEDB Expert



NGSА Configurator



TT Dispatcher







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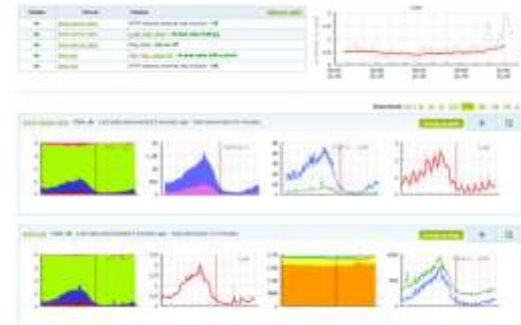
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## GNOC Tools

### Unified Network Resource Inventory



### Network Performance MaNagement



### Unified Trouble Ticketing System



**Acceleration of  
Customer  
problem fixing**

### Unified E2E service testing system

Тестирование в сети NG

Имя	Рекомендовано	Выполнено	Успешно	Неудачно	Время
...	...	...	...	...	...

Тестирование в сети NG

Имя	Рекомендовано	Выполнено	Успешно	Неудачно	Время
...	...	...	...	...	...

Тестирование в сети NG

Имя	Рекомендовано	Выполнено	Успешно	Неудачно	Время
...	...	...	...	...	...

### Unified Network Monitoring System

Имя системы	Состояние	Вид	Тип	Ссылка	ИД	Ресурс
18.04.2022 17:29 18:20	...	...	...	...	...	...



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## From Network to the Service Quality

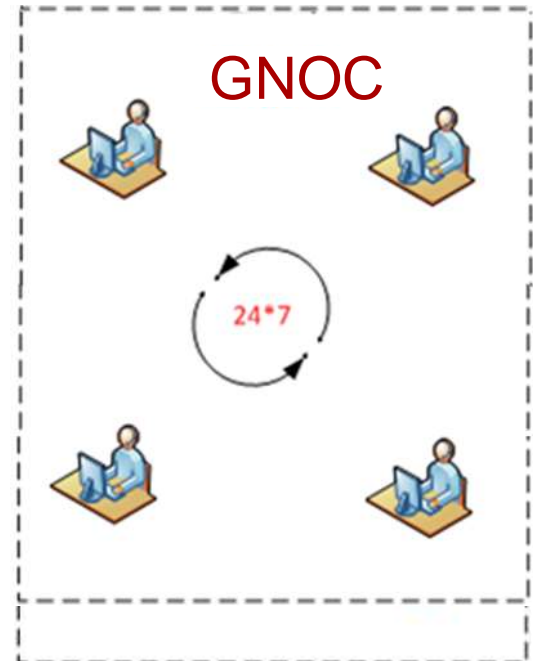
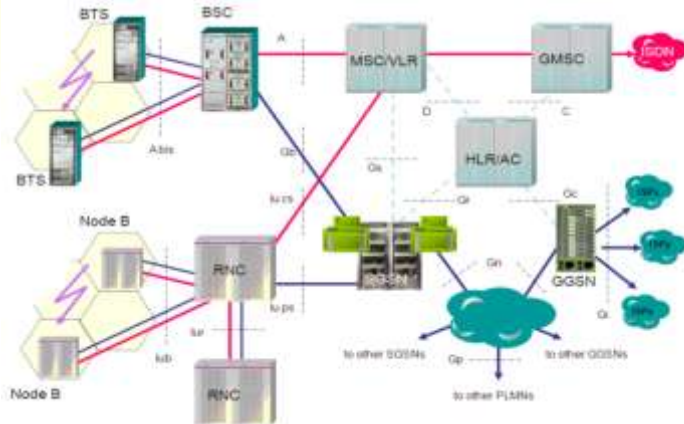
Customers



Services



Network



## Benefits

- The centralized network monitoring platform
  - One umbrella system for all Alarms
  - Alarm enrichment with NE, Location and Customer Details
  - Alarm reduction by suppression & correlation
  - The additional prioritization of alarms according to the importance of specific devices
  - Impact analysis by use of service affecting alarms via service and customer models
- The standardized operator's work environment
  - One system – one GUI (Operators View)
- Automation of routine and time consuming tasks
  - Semi and automatic triggering of TT creation, update and close
  - One click actions perform on NEs (scripts embedded and run directly from the NGSA GUI)



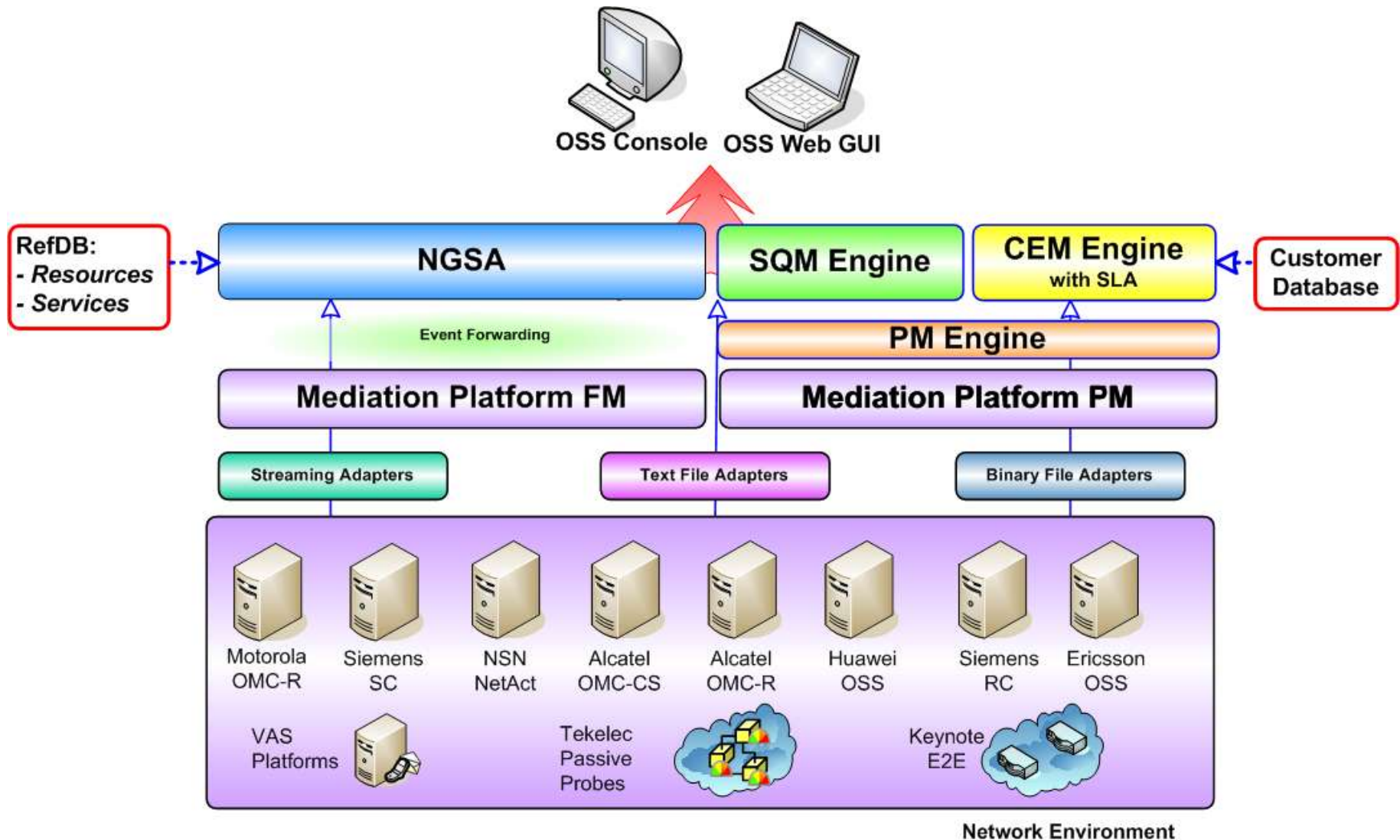
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## Further steps

- Building unified NGOSS Platform by:
  - NGSA extension - Transport network monitoring with topological correlation
  - NGSA extension – Comstar and MGTS network monitoring
  - Continuation towards the calculation of impact on customer and resource-facing services by giving insight into customer perception will be covered by implementation of:
    - Comarch **SQM**
    - Comarch **CEM**
    - Comarch **PM**

## Further steps







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# Alarm List

Increasing of Alarm priority by VIP Number - Comarch OSS - Context: Current - Data: Current - All

Window Filters Edit View Tools Help

Notification Identifier	Event Time	MO Resource Identifier	Perceived Severity	Priority	Priority Level	SLA Priority	Additional Text
Test_Alarm	2011-10-26 11:57:39	BSC 72-134	Critical	100	3		
SQM_00012_PPC 77-510-423	2011-11-30 11:25:00	PPC 77-510-423	Major	90	3		
SQM_00014_250-01-6424-60351	2012-02-20 15:00:00	250-01-6424-60351	Warning	-1			
SQM_bolek	2012-02-04 09:04:58	250-01-47800-1349	Minor	-1	5		
SQM_00015_250-01-48083-10577	2011-10-26 15:40:00	250-01-48083-10577	Critical	-1			
SQM_00015_250-01-4904-15931	2011-10-26 17:05:00	250-01-4904-15931	Critical	-1			
SQM_00014_250-01-750-47181	2012-02-20 15:00:00	250-01-750-47181	Warning	-1			
SQM_00014_250-01-6424-60272	2012-02-20 15:00:00	250-01-6424-60272	Warning	-1			
SQM_00015_250-01-51800-10818	2011-10-26 18:30:00	250-01-51800-10818	Critical	-1			
SQM_00015_250-01-47200-1092	2011-10-26 05:35:00	250-01-47200-1092	Critical	-1			
SQM_00014_250-01-6424-60271	2012-02-20 15:00:00	250-01-6424-60271	Warning	-1			
SQM_00015_250-01-4900-15806	2011-10-26 20:00:00	250-01-4900-15806	Critical	-1		1	
SQM_00015_250-01-52600-1467	2011-10-26 19:15:00	250-01-52600-1467	Critical	-1			
SQM_00015_250-01-47800-1699	2011-10-26 19:40:00	250-01-47800-1699	Critical	-1			
SQM_00015_250-01-50001-10547	2011-10-26 17:10:00	250-01-50001-10547	Critical	-1			
SQM_00014_250-01-1306-2614	2012-02-07 17:30:00	250-01-1306-2614	Warning	-1			
SQM_00015_250-01-50200-11678	2011-10-26 16:05:00	250-01-50200-11678	Critical	-1			
SQM_00014_250-01-4900-212	2012-02-07 17:30:00	250-01-4900-212	Warning	-1			
SQM_00014_250-01-4900-15101	2012-02-08 17:30:00	250-01-4900-15101	Warning	-1			
SQM_00015_250-01-48083-10578	2011-10-26 18:35:00	250-01-48083-10578	Critical	-1			
SQM_00015_250-01-53200-1259	2011-10-26 19:35:00	250-01-53200-1259	Critical	-1			

	Indeterminate	Critical	Major	Minor	Warning	Cleared
New	0	132	3	1	796	0
Ack	0	0	1	2	4	0
Total	0	132	4	3	800	0

List of 939 objects

Owner: CA\_pgedek Type: Alarm Context: Current - Data: Current - All



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## Comarch Geo View

VIP Movement Profile (copy) - Comarch OSS - Context: Current - Data: Current - All

Window Filters Edit View Tools Actions Help

Zoom by: 1.3

Layers Parameters

Type	Visible	Labels	Name
abel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Best Servers: ...
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DC Last KPI ...
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Moscow

0 120 600 m Scale 1:40647

Selected: 0 37°34'50.3532"E 55°46'26.505"N 410966.0 6181842.0 Owner: SQM\_demo Context: Current - Data: Current - All



## Comarch Geo View

Corporate Area with KPI values (copy) - Comarch OSS - Context: Current - Data: Current - All

Window Filters Edit View Tools Actions Help

Zoom by: 1.3

Layers Parameters

Type	Visible	Labels	Name
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	AVG Network a...
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Best Servers
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Corporate Area
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	AVG CSSR valu...
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Moscow

0 200 1000 m Scale 1:85443

Selected: 0 37°48'48.8222"E 55°46'52.5376"N 425590.0 6182373.0 Owner: SQM\_demo Context: Current - Data: Current - All





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Products - Comarch OSS

Window Filters Actions Help

M6\_R23 Voice

- M6\_R23 Voice IN mobile
- M6\_R23 Voice IN MT
- M6\_R23 Voice OUT international MTS
- M6\_R23 Voice OUT international other
- M6\_R23 Voice OUT local MTS
- M6\_R23 Voice OUT local other
- M6\_R23 Voice OUT local other MT
- M6\_R23 Voice OUT Russia MTS
- M6\_R23 Voice OUT Russia MTS other
- M6\_R23 Voice OUT service
- M6\_R23 Voice Service
  - M6\_R23\_2G\_RAN
    - M6\_R23\_2G\_RAN\_BSCs
      - M6\_R23\_BTS\_in\_BSC 23-11
      - M6\_R23\_BTS\_in\_BSC 23-12
      - M6\_R23\_BTS\_in\_BSC 23-121
      - M6\_R23\_BTS\_in\_BSC 23-151
      - M6\_R23\_BTS\_in\_BSC 23-152
      - M6\_R23\_BTS\_in\_BSC 23-161
      - M6\_R23\_BTS\_in\_BSC 23-191
      - M6\_R23\_BTS\_in\_BSC 23-31
      - M6\_R23\_BTS\_in\_BSC 23-41
      - M6\_R23\_BTS\_in\_BSC 23-42
      - M6\_R23\_BTS\_in\_BSC 23-61
      - M6\_R23\_BTS\_in\_BSC 23-71
      - M6\_R23\_BTS\_in\_BSC 23-81
      - M6\_R23\_BTS\_in\_BSC 23-91
    - M6\_R23\_3G\_RAN
      - M6\_R23\_3G\_RAN\_RNCs
        - M6\_R23\_NodeB\_in\_RNC-23-0195-01
        - M6\_R23\_NodeB\_in\_RNC-23-161
        - M6\_R23\_NodeB\_in\_RNC-23-162
        - M6\_R23\_NodeB\_in\_RNC-23-163
        - M6\_R23\_NodeB\_in\_RNC-23-164
        - M6\_R23\_NodeB\_in\_RNC-23-165
        - M6\_R23\_NodeB\_in\_RNC-23-166
    - M6\_R23\_CS\_Core

Parameters Propagation Additional Attributes

M6\_R23 Voice [Product]

- Location
- Service Domain
- Service Group
- Service Topic
- Child Services
- Customers
- Parent Services
- Products
- Resources
- Service Interests
- Services

All attributes  Hide empty attributes

Property	Value
Identifier	M6_R23 Voice
Name	M6_R23_2G_Voice
Monitoring State	True
Impact Event	False
Propagation Flag	True
Service Domain	Telco
Object Type	Product
XCreateUser	SM_ossadmin
XCreateDate	2012-05-29 18:14:22
XModifyUser	CA_bdomagala
XModifyDate	2012-06-26 14:27:05

Number of objects: 100

Owner: yaroslav | Context: Current - Data | Current - All





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# SLA Module

SLA Monitoring - Energy Supplier (Read only) - Comarch OSS - Context: Current - Data: Current - All

Name	Successful Transmissions R...	Transferred Data (Max)
ALL	100	37,644
MO3K (Corporate Customer)	100	37,644
SLA 02/2011 MO3K	100	18,350
Monitoring of Heating Sensors	100	18,350
Standard Parameters	100	18,350
Heating Sensors group	100	18,350
SLA 03/2011 MO3K	100	37,644
Monitoring of Heating Sensors	100	37,644
Standard Conditions	100	37,644
79104518317		
79104519311		
79104519038		
79104520246		

Summary Quality KPI Charts

Transferred Data, last 4 days, Heating Sensors group

MIO: Heating Sensors group KPI Transferred Data

MIO: Heating Sensors group KPI Successful Transmission

SLA Monitoring View - Mobile Media - Comarch OSS - Context: Current - Data: Current - All

Name	Availability Rate	Average Availability	Time To Restore	Outages	Open Outages	Outages in Progress	Color	Quality	Rate
Mobile Media	99.47	99.47	44:14:19h:32s	8	1	1	0	0	0
SLA VO Mobile_Media_11_11	99.47	99.47	44:14:19h:32s	8	1	1	0	0	0
Fast PC2	99.08	99.08	46:15h	7	1	1	0	0	0
Fast	99.02	99.02	144:22h:40m:46s	1	0	1	0	0	0
NPCD-Sub-04	99.02	99.02	144:22h:40m:46s	1	0	1	0	0	0
Sub	99.02	99.02	46:15h	8	1	0	0	0	0
NPCD-Reg. US E2-PC Collocated BSC	100	100		0	0	0	0	0	0
NPCD-Reg. US E2-MW Remote BSC	100	100	46:15h	1	0	0	0	0	0
NPCD-Remote BSC	99.10	99.10	134:29m:21s	9	0	0	0	0	0
NPCD-Reg. US E2-RM Collocated BSC	100	100		0	0	0	0	0	0
Mobile Med	99.05	99.05	44:14:19h:32s	1	0	0	0	0	0
Service	99.05	99.05	44:14:19h:32s	1	0	0	0	0	0
Media RTN-01	100	100		0	0	0	0	0	0
Media POLD-07	100	100		0	0	0	0	0	0
Media POLD-09	100	100		0	0	0	0	0	0
Media VO-04	99.79	99.79	44:14:19h:32s	1	0	0	0	0	0

Outages Charts Outages History SLA Summary

Last Days: 4 Hours: 0 Mins: 0

Range Start: 2011-01-01 17:36:00 End: 2011-01-01 17:36:00

Outages in Time

Performance Level: Outage (Red), Planned (Yellow), Service Operational (Green)



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## Reporting Module

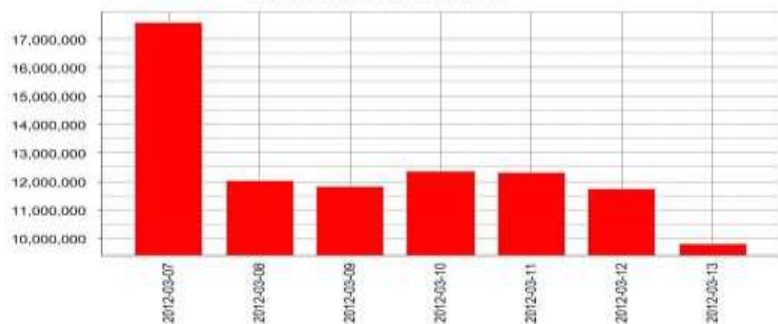


### Energy Supplier SLA Report

Date: 14-Mar-2012  
Time: 11:36:39

Customer: МОЭК (Corporate Customer)  
SLA Contract: SLA 02/2011 МОЭК

Transferred Data for last week



Successful Transmissions Ratio for last week



### Report – SLA Summary

Date: 28-Feb-2011  
Time: 23:59:59

CUSTOMER Mobile Media

SLA CONTRACT SLA Mobile Media 04/2011

PERIOD 2011/02/01 – 2011/02/28

	Availability	Availability Threshold	Outages	Reaction Overtime	Restore Overtime
IPTV	99,12%	-	22	13h 47m	1d 18h 46m
Gold	98,98%	99,9%	12	5h 46m	1d 4h 39m
Authorization Server 01	99,97%	99,9%	1	2h 45m	45m
Video Quality Probe 01	97,22%	99,9%	8	1h 24m	1d 1h 24m
Video Signalling Probe 01	99,74%	99,9%	3	2h 30m	2h 30m
Silver	99,25%	99%	10	3h 12m	14h 7m
Authorization Server 02	98,77%	99%	5	42m	1h 42m
Video Quality Probe 02	99,10%	99%	3	1h 52m	7h 52m
Video Signalling Probe 02	99,88%	99%	2	33m	4h 33m

PERIOD 2011/01/01 – 2011/01/28

	Availability	Availability Threshold	Outages	Reaction Overtime	Restore Overtime
IPTV	99,12%	-	22	9h 42m	15h 26m
Gold	99,28%	99,9%	12	3h 26m	4h 39m
Authorization Server 01	98,97%	99,9%	4	2h 45m	1h 25m
Video Quality Probe 01	99,92%	99,9%	1	1h 24m	5h 24m
Video Signalling Probe 01	99,99%	99,9%	2	30m	2h 34m
Silver	99,12%	99%	10	2h 42m	9h 7m
Authorization Server 02	99,37%	99%	2	1h 42m	2h 52m
Video Quality Probe 02	98,90%	99%	3	52m	5h 42m
Video Signalling Probe 02	99,68%	99%	4	1h 23m	2h 37m



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**THANK YOU**

**Sergey Bougaev**, Project Supervisor,  
Global Network Operation Center, MTS