NETWORK OPERATION CENTER

NOC in Mobile Operators

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Introduction

This research describes Network solution which will provide cost optimization while managing and transforming Network Operations Center according to International Telecom Best Practices.

Scope of Services

This research details NOC (Network Operations Center), and this includes full service level responsibility as well as establishment of operations framework including processes procedures and tools.

Technical solution is structured to deliver the following activities and functions:

- **1st Level Operations**: management of alarms and problems for all infrastructure and related services;

- **2nd Level Operations**: maintaining resource and related service availability through resolving problems and performance issues;

- **Customer Problem Management**: management of the customers problems escalated from Operator Customer Care;

- **Service and Resource Fulfilment**: execution of data and parameter changes on the in-service resources to pre-provision and activate resources for customers' services;

- **Operations Support**: including Performance Reporting, Operations Assurance, Working Level Agreement Management, Tools and Processes.

Network Operations Center

The following sections describe activities to be performed by NOC on Mobile Operator network:

1. First Level Operations

The First Level Operations (FLO) teams manage alarms and problems for all resources / infrastructure and related services on 24 x 7 bases. In order to meet the working schedule, FLO teams will be structured to work per shift basis.

FLO activities will perform the following activities on Mobile Operator network:

- Surveillance and network resources monitoring 24x7,

- Service Alarm and Problem Handling,

- First Level Service Restoration,

- Track and Manage Resource and Service Problem,

- Service Performance Monitoring,

- Resource Alarm Handling,

- Resource Performance Monitoring,

- Control & Support Reactive or Planned Activities,

- Management Notification and Escalation,

- Conduct real-time Change Permission & Surveillance,

- Perform First Level Routine Maintenance,

- Dispatching of Trouble Tickets to Field Services.

2. Second Level Operations

The Second Level Organization (SLO) teams maintain availability of resources / infrastructure and related services through resolving problems and performance issues. SLO teams provide extended support to the FLO teams in fault management issues. They also manage the network regarding performance and trends as well as the provisioning and activation of services.

features and functions.

The SLO will perform the following operational activities on Mobile Operator network:

- 2nd Level Service and Resource Fault Restoration,

- Escalation to Vendor support,

- Handle Incident Management, Post Incident Reviews,

- Technical Impact Analysis of Proposed Change Requests,

- Routine Schedule Definition & Co-ordination,

- 2nd Level Routine Maintenance,

- Security Control,

- Resource Operational Configuration (parameters),

- Service Provisioning (parameters),

- Operational Service and Resource Acceptance,

- Capacity Management,

- Performance Management,

- Root Cause Analysis,

- Resource Inventory

3. Event Management

NOC Vendor should fully support Mobile Operator during special Event Management preparation and execution. NOC Vendor engagement during the event management includes: support for event planning, arranging special performance team's duties during special events, managing and delivering the event (within the scope of responsibilities), periodic performance reporting and benchmarking with previous events.

The events will include: National Holidays (like Nawroz), Special and Annual Events (like; Ramadan Declaration, Ramadan Period, Eid Al Fittr, Hajj period, Eid Al Adha), and any large Network changes and upgrades.

4. Customer Problem Management

The main responsibility of Customer Problem Management is to manage end customer problems escalated from Mobile Operator Customer Care. The Customer Problem Management function will perform activities such as:

- 1st Level End-user Fault Restoration, Initial analysis and fault localization for Single end-user faults. Initiate corrective action on any alarms as per process documents. Creation, dispatch, follow-up and closure of end-user trouble tickets to First and Second Level Operations

- 1st Level End-user Fault Trending, Trend end-user faults to identify multiple end-user faults and escalate to First Level Operations to resolve system issue

- End-user Outage Notification, Notify Customer's Customer Management of Service affecting problems.

- Prioritize complaints coming from Very Important Customer (VIP) in order to improve VIP customer satisfaction.

- Provide relevant input and recommendation to Mobile Operator demand organization in order to improve overall network performance and enhance customer experience

5. Resources Fulfilment

This function performs data and parameter changes on the in-service resources / infrastructure to pre-provision resources for end-customer services and to activate individual customer services.

It comprises elements such as Resource Operational Configuration (parameters), Service Pre- Provisioning (parameters), Engineering Order Completion, Operational Service Acceptance, Operational Resource Acceptance, Manage Service & Resource Inventory, Tracking Customer Order Activation / Upgrades / Rearrangements / Deactivation, Customer Order Design, Engineering Request, Remote Data-fill, End-to-End Test and Presales support.

Operations Support

The Operations Support function will deliver the following:

1. Change Management and Common Process

2. Acceptance and Quality Assurance

3. Performance Management and Reporting

1. Change Management

The Change Management process is part of the configuration management.

The inter-working between Mobile Operator and the input to this process shall be a Request for Change (RFC) created by Mobile Operator.

Vendor will adhere to Mobile Operator existing change request process. This process should normally include:

- Change request assessment and coordination

- Seek change implementation approval from relevant stakeholders, via the formal change management procedure,

- Management of change scheduling and informing relevant stakeholders

- Final approval and closure of change requests, according to Change Management process,

- This function will work closely with the SLO (Second Level Organization) manager since change management is controlled and managed by SLO.

2. Acceptance and Quality Assurance

This function will be responsible to perform continuous auditing on processes and ways of working in order to ensure delivering the services, according to committed delivery standards. The main deliverables of this function are:

- Perform continuous verification on implemented processes including: ways of working, implemented processes and escalations;

- Ensure that all acceptance criteria and certificates are properly implemented in order to secure smooth acceptance between operational entities;

- Assist Mobile Operator to successfully perform any auditing exercise in terms of compliancy and proper implementation

3. Performance Management and Reporting

Vendor will deliver the Performance Management and Reporting as per the following deliverables. The performance monitoring covers all Technology areas (Mobile Operator Services, Network, corporate services, VIP customers and IT) Continuously monitor the network performance (BSC, RNC level) based on Mobile Operator approved KPIs and KQIs measurements and statistics.

- Compare the captured data and usage patterns of previous periods to detect faults and miss-configurations.

- Collect feedback and analysis for any service abnormality.

- Raise a ticket for any service abnormality.

- Provide required reports to forecast performance trending and analyze the effect of network change.

- Provide performance reports.

- Support automatic profiling for specified counters and sites for ideal network behavior and compare the value against the current data. If there is a vast difference.

- Capable of providing Network Performance Parameters every 5, 15, 30, 60 minutes and real time/near real time for major services, Roaming and International Calls KPIs and KQIs.

- Reports shall be accessed through single performance portal and to extract in other formats.

- Work in standardize and harmonize all Network Performance Parameters across different vendors and regions to allow aggregation and conduct comparability studies between vendors and regions.

- Arrange special performance team's duties during special events - Ramadan Declaration, Ramadan Period, Eid Al Fittr, Hajj period, Eid Al Adha, large Network changes and upgrades.

- Equipped with required tools to monitors SLA compliance.

- Use all existing Mobile Operator performance tools and probes and future offered tools.

Information Security Management

Vendor will adhere to Mobile Operator Information Security measurement in place and will be responsible for:

- Adhere to Mobile Operator Baseline Security Requirements for the managed services contract

- Perform periodical Risk and Security Assessments and provide Mobile Operator with the necessary recommendation

- Review and propose updates to the Baseline Security Requirements based on the Risk and Security Assessments.

Graphical representation to Data Collection
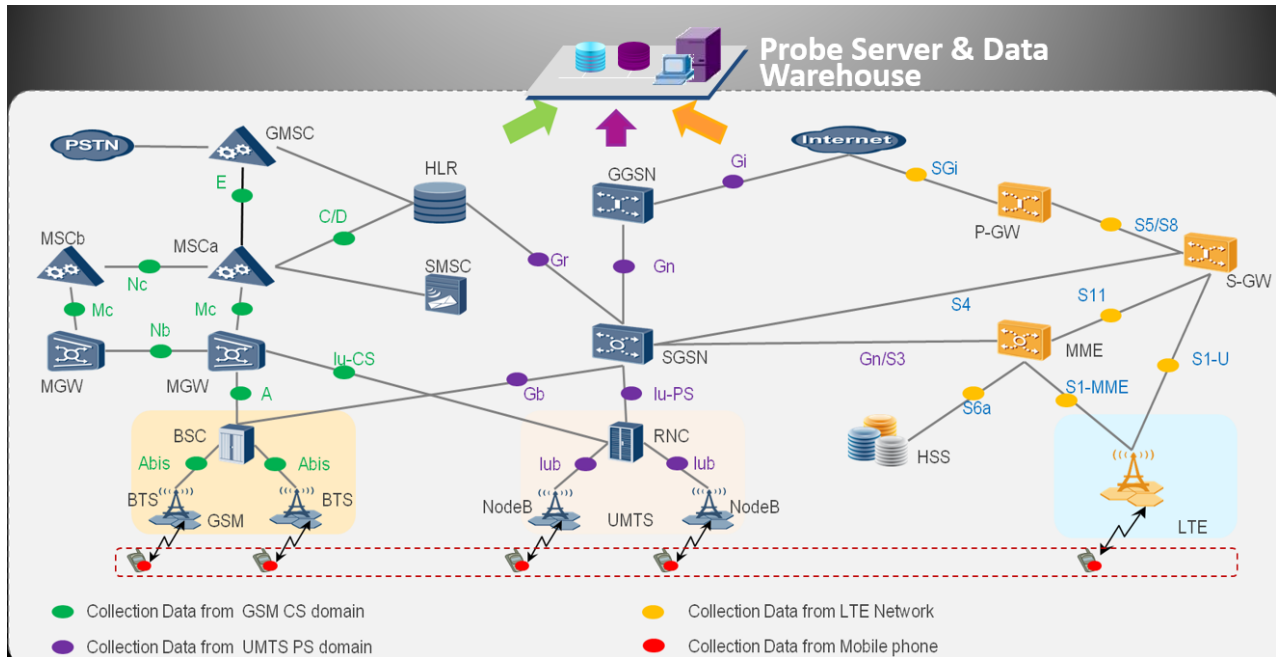
NOC & SOC Room

The following points are some architecture and technology setup in NOC&SOC room

1. Room dimensions around 30x50 m
2. Loaded with 1 big screen with multi views
3. Both NOC and SOC team sitting in same room
4. Coverage area population is 55M

The following figures shows customer distribution and traffic trend

Population of Zhejiang Province: 55 million

	Sites	Subscribers	Average Data Traffic (DAY)
2G	67 thousands	23 million	52 TB
3G	44 thousands	11 million	38 TB
4G	81 thousands	25 million	1148 TB

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