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Work Flow of Network Operation Centre for a Cellular Mobile System

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Abstract: This paper presents contribution of Network Operation Centre (NOC), which is a crucial centre to any Telecommunication Network; it gives a detailed image of the networks which are being monitored. It is a place from where a detailed status of the network can also be seen, a point for network troubleshooting, software distribution and updating, router and domain name management, performance monitoring, and coordination with affiliated networks.

Keywords: Network Operation Center, monitor, troubleshooting, management, coordination

I. Introduction

Network Operation Center (NOC) is a crucial element of any Network. It houses the centralized Network Management System that performs network surveillance activities to ensure that the network and the services it offers are available at all the times.

Network Surveillance / Trouble Management Solution is needed for Quick and accurate response to customer complaints, to implement processes and SLAs daily operations, shortened lead-time for restoration of network and service disruptions & for a positive reaction to your quality of service. The job duties of the NOC also includes generation of reports like the daily, weekly and the monthly reports which includes the planned and the unplanned activities occurring in the network during the day, week and the entire month respectively.

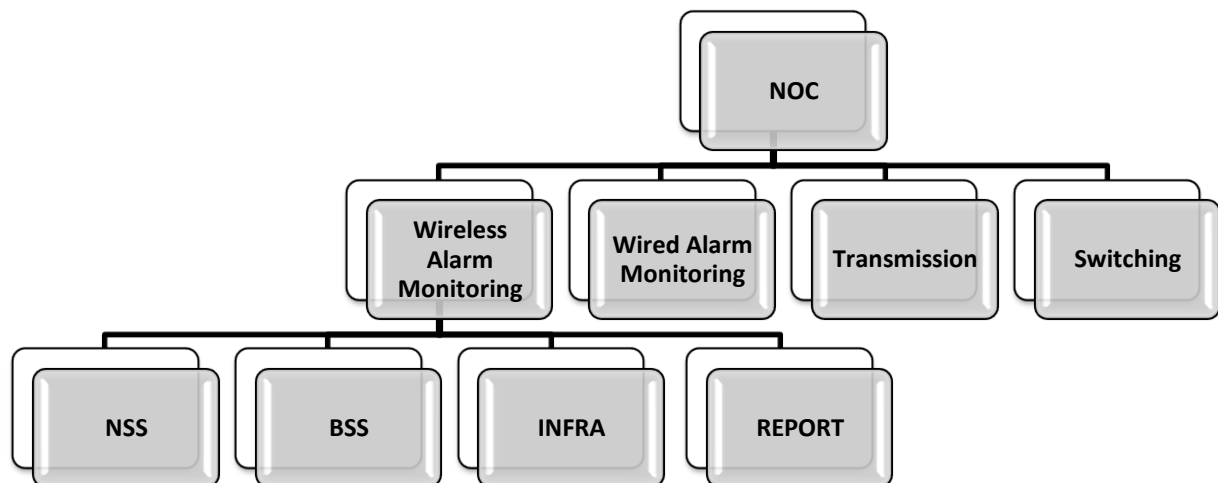


Fig. 1 Sections of NOC

The various sub-sections of NOC coordinate with each other to fulfill the demand and management in GSM Communication. NSS (Network Switching Centre), known as Core Department looks after the monitoring and management of MSC, STP, MGW and HLR. Transmission section looks after the GSM Transmission, which is done both wirelessly and through wired media. INFRA and BSS are other two sub-sections of NOC. BSS monitor and manage network connectivity of various sites and BSC. INFRA has job related to monitoring external alarms (i.e. alarms due to third party issues) on various nodes. Alarms monitoring and their management are performed on various hardware specific software's. Monitored faults and alarms are escalated as per proper channel and their rectification is done.

II. Alarms

Alarms and state change events provide indications of faults resulting in loss of service or degradation of service, or as warnings of potential service-affecting faults. Events/alarms are also generated by the OMC-R, for example in the case of OML failure.

A. Types of Alarms

- i. **Fault Alarms:** Fault alarms are generated when faults occur in the equipment, such as board faults. The fault alarms can be cleared through fault handling.
- ii. **Event Alarms:** An event alarm indicates a predefined event that happens during the running of the devices, such as channel congestion. The alarm represents an instantaneous status of the system and the status may not be a fault. Some event alarms are re-sent periodically. For example, if periodic check finds that the resource is insufficient, the resource check event alarm is re-sent. Event alarms do not require handling.

III. Task and Responsibilities

Work includes surveillance and assurance of service quality with LEVEL 1 Operations activities of BSS/CORE/MPLS/TRANSMISSION/INFRA. Activities include monitoring and escalation of all the alarms and faults so that faults should be restored/resolved within the stipulated time period.

Main responsibilities include:

- Monitoring of Alarms
- Management of Alarm for assured network service
- Management of Docket/Ticket
- Remedy of faults which are required on faulty sites are timely dispatched to technical field
- Handling Work Order

IV. Operations and Functions

NOC functions and operation is basically looking towards three main objectives: the organizations mission, the support to the individuals, and network security. Faults are looks accordingly as their severity level. Severity expresses the level of impact that a fault condition has on a device and/or current system functionality. Alarm severity is used to establish fault handling priority. Severity of alarms, their definition and troubleshooting has been presented in Table 1.1 and Table 1.2 presents process details of Alarm Analysis and Monitoring.

Table 1.1 Different levels of alarms and their handling methods

Alarm Severity	Definition	Troubleshooting
Critical alarm	Reporting faults that affect the services provided by the system These alarms need immediate treatment even during off-work period. For example, some equipment or resource breaks down.	Handle the faults immediately. Otherwise, the system may collapse.
Major alarm	Reporting faults that affect the Quality of Service (QoS). These alarms need treatment during working hours. For example, the performance of some equipment or resource deteriorates.	Handle the faults timely. Otherwise, the system may fail to perform some major functions.
Minor alarm	Reporting faults that are not serious enough to affect the QoS. These alarms need timely treatment or further observation to avoid worsening.	Find and clear any potential fault in time.
Warning alarm	Reporting faults that potentially threaten the system services. No handling is required.	Learn the running status of the system.

Table 1.2 Process Details of Alarm Analysis and Monitoring

Activity	Stepwise Description	Responsibility
Fault Analysis Procedure	1. Activities include monitoring and escalation of all the alarms and faults so that faults should be restored/resolved within the stipulated time period.	OMCR/O&M Team/NS Team
	2. To reduce the huge occurrences of Service-affecting & Non service affecting alarms.	
	3. Analyzing the alarms, the faults can be localized and fixed either remotely or locally.	
	4. The alarms (both real time & Offline) are viewed on software.	

V. Escalation of Alarms

Steps involved in escalation of alarms in general consist of following in sequence:

Process Steps:

1. Alarms are 24*7 monitored by Network Surveillance (NS) Team.
2. In case of Failure, phone call is placed to the Heads & O&M team of Zone, mentioning the details of affected Area and Alarm.
3. SMS is send to Heads & O&M team of Zone mentioning the Area affected and Alarms.
4. After the restoration NS Team confirm via SMS.

VI. Conclusion

NOC, which is a part of Managed Services, is a partnership between a vendor and a customer in which the vendor assumes responsibility for activities such as designing, building, operating and managing the day-to-day operations of the customer's network or solution. Network Operations Center (NOC) is a responsive and high speed center operating in proactive mode to be able to resolve network problems instantaneously. The NOC's environment should be that of a methodical, preventative maintenance one versus a crisis management mode.

VII. References

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