ACCESSNET®-T IP NMS
Network Management System

The Network Management System (NMS) can be used to manage and monitor the infrastructure and various services of an ACCESSNET®-T IP network.

The NMS is a distributed multi-client and multi-server system with integrated databases, whose modular design can be scaled according to the respective requirements and size of the network.

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Network Management System

NMS

**ACCESSNET®-T IP
Network Management System**

Our NMS is the network management system for the TETRA mobile radio system ACCESSNET®-T IP from Hytera Mobilfunk GmbH. With this software package, you manage all of the functions, network elements and subscribers of your TETRA mobile radio solution from Hytera Mobilfunk GmbH. For each TETRA system, we supply an individual NMS package with all the required modules. Thanks to the modular design, you can expand it as needed and optimally adapt it to your system.

Our network management system is complete. Different network management clients (NMCs) are available for all the management and configuration tasks in the ACCESSNET®-T IP. We implement them in the system according to your requirements and the scope of functions of your TETRA system.

Overview of the Technology

Our NMS is based on an almost infinitely scalable client-server architecture. This allows the system to provide you access from a central location as well as from distributed locations within the ACCESSNET®-T IP network – no matter how complex your mobile radio solution is designed.

All the clients access the current data provided by NMS servers via IP network. The decentral architecture of the NMS protects your mobile radio network against data losses, optimizes operational sequences and offers you demand-tailored, highly configurable control functions.

Our NMS at a glance:

- User-friendly software for managing your Hytera TETRA mobile radio solution
- Flexible management of all functions, network elements and subscribers
- Modular structure scalable to any system size
- Extremely configurable data access via robust IP networking
- Maximum data availability and security
- Highly automated, dependable processes
- Uncomplicated coupling and monitoring of external system components
- Access control to the NMS to protect the system
- User interface (GUI) of NMS applications already available in many languages, additional languages possible upon customer request

Strong through standardization

The functions of the Network Management System are distributed based on the standardized network management model "FCAPS" (Fault, Configuration, Administration/Accounting, Performance and Security Management) in accordance with ITU-T M.3010 (02/2000, International Telecommunication Union).

The following functions are available via the network management system:

- Fault Management
- Configuration Management
- Subscriber Management and a billing interface as part of Accounting Management
- Performance Management
- Security Management
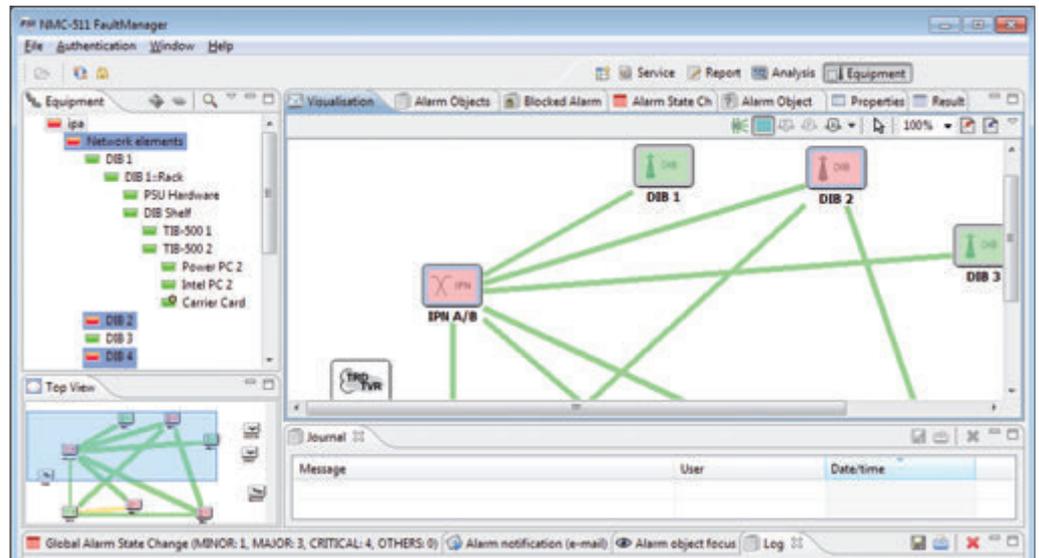
Fault management

The fault management of the ACCESSNET®-T IP allows monitoring all network constituents, such as hardware/software components and connections in real time from remote locations.

It is thus possible to respond promptly to all events through the fault management and to intervene actively by means of servicing functions when necessary.

On top of that, the fault management provides extensive report and analysis options. All acquired operating states are stored and can be queried and analysed at any time.

Via SNMP interfaces (Simple Network Management Protocol, SNMP), it is also possible to integrate and centrally manage – apart from the network constituents of the ACCESSNET®-T IP network – additional components such as microwave radio links, intruder alarm or fire alarm systems or rack monitoring systems with the NMS. of Hytera

Furthermore, integration into superordinated management solutions (Umbrella Management System) is also possible.

NMC-511 FaultManager

The NMC-511 FaultManager is the client software in the NMS for the fault management. Like all clients of the NMS, the NMC-511 is designed in accordance with state-of-the-art software development.

- For prompt fault removal in the system, faults that occur in the ACCESSNET®-T IP are quickly recognized and localized with the NMC-511 FaultManager.

- All the network constituents of an ACCESSNET®-T IP are monitored via the NMC-511 FaultManager.

- Operating states and faults are acquired by the Network Management System and visualized with the NMC-511.

- For permanent network monitoring, the NMC-511 FaultManager represents the operating states and faults in an alarm status list with reference to the corresponding network element.

- Forwarding of alarm messages via e-mail.

- Audio-visual alarm signalling
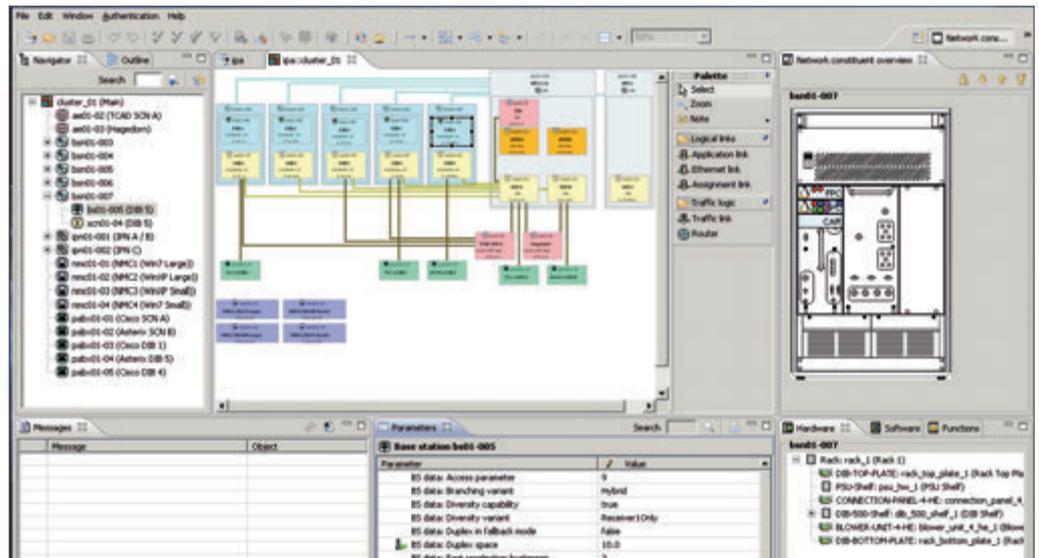
Configuration management

The configuration management in the ACCESSNET®-T IP enables the simple, yet extensive configuration of your TETRA mobile radio network from Hytera. With its well thought-out concept, the configuration management offers many advantages for our customers, such as:

- The operating costs for distributing the software and configuration updates are kept low since they do not have to be performed on site, but can be applied during operation from a remote location.

- The creation of the network model is supported by the software and enables an error-free and quick creation of the network configuration, which is facilitated even further through the logical grouping of available configuration parameters.

- A majority of the required configuration parameters is being calculated automatically in the process.

- During its creation, the network model is already being checked for faults, and this guided troubleshooting avoids incorrect network configurations.

- Extensive libraries of preconfigured network elements are already included.

- The entire download process of the configuration files runs in the background in a resource-saving way.

- The configuration management is robust and fault-tolerant.

For the configuration management in the NMS, the network management clients NMC-515 ConfigurationManager and NMC-522 DownloadManager are being used:

- The network configuration for the TETRA mobile radio system ACCESSNET®-T IP is being generated via the network management client NMC-515 ConfigurationManager.

- Finally, the generated configuration files can be transferred with the aid of the Network Management Client NMC-522 DownloadManager to the network constituents.
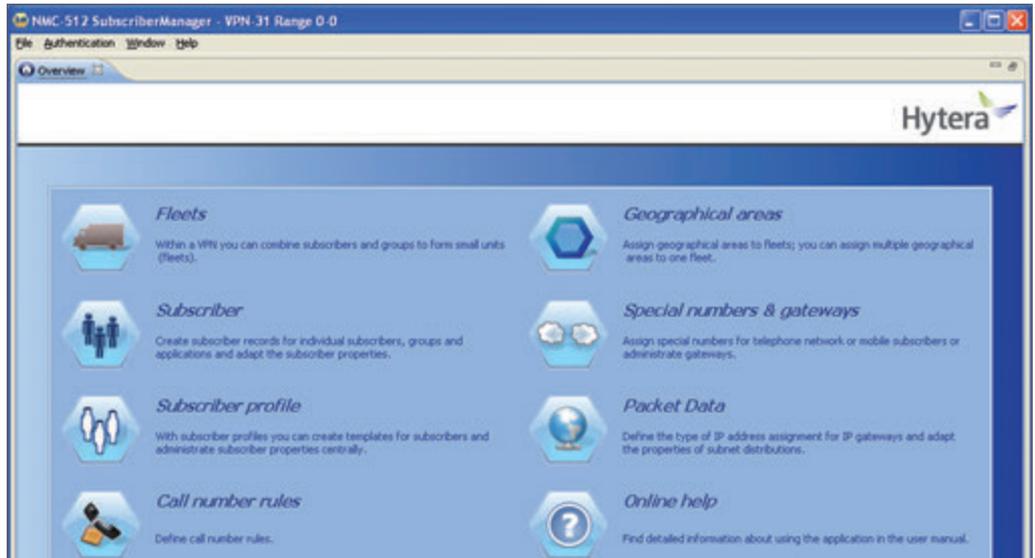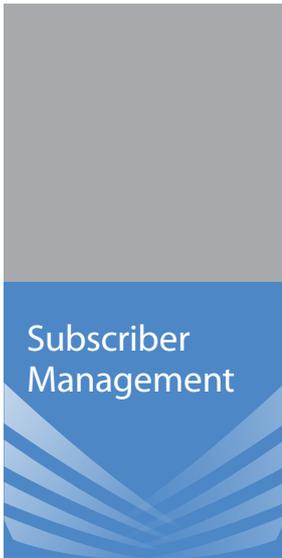
Accounting management

The accounting management in the ACCESSNET®-T IP enables the central management of all subscriber data in the system.

This includes creating subscribers, groups and fleets as well as managing authorisations and all the other data that are associated with subscriber information (such as geographical areas, special numbers, call records). A convenient and quick change of subscriber properties is possible via permanent or temporary profile attachment.

The subscriber data are stored in the network database and cyclically exported. When executing software and configuration downloads inn the system, the subscriber data are automatically being updated in the background.

Furthermore, the accounting management provides functions for evaluating the call-specific connection data, which makes a selective evaluation of call scenarios, busy hours etc. possible. In addition, reports on call data records (CDR) can be created and saved for analysis purposes. In addition, data can be exported for billing systems.

Mobile stations can be deactivated during ongoing operation, e.g. temporarily or permanently (enable/disable or stun/kill). This can be meaningful to prevent an unauthorised use in case of lost or stolen mobile stations.

NMC-512 SubscriberManager

The network management client NMC-512 SubscriberManager is used for administering subscriber data as well as configuring and managing different user organisations within an ACCESSNET®-T IP.

Functions for call-specific performance management (traffic management) (evaluation of call scenarios, busy hours etc.) are also included.
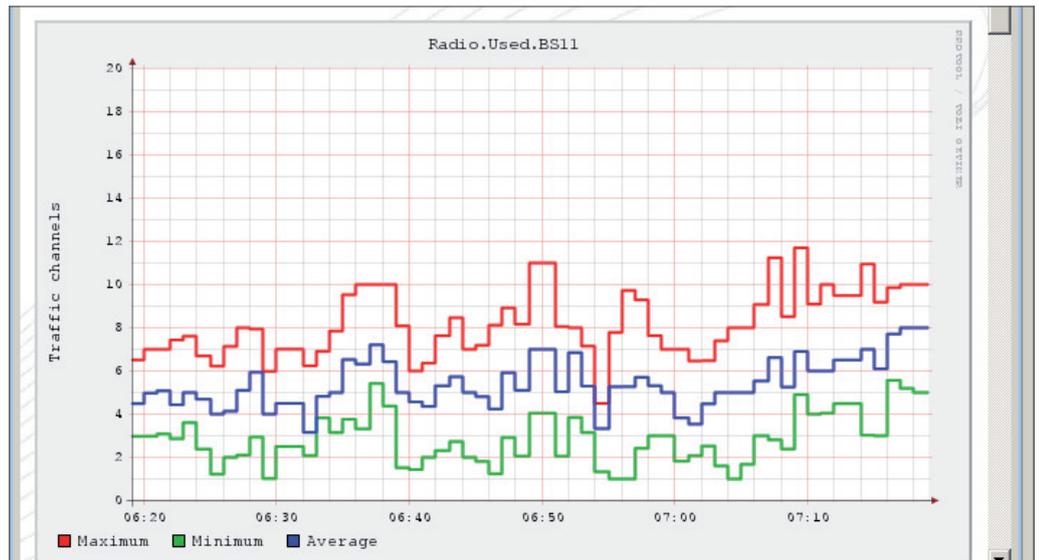
Performance management

The performance management in the ACCESSNET®-T IP determines and analyses the network utilisation. This enables targeted measures for network optimisation.

The network utilisation is being measured continuously – on the connection lines between system controller nodes and gateways (e.g. telephony gateways) as well as on the channels of the air interface. The measured values are stored as performance data in the network database of the network management system and are thus available for analysis.

The NMC-513 PerformanceManager is used for the visualisation of system-based and specific performance data. The NMC-513 PerformanceManager accesses the performance data and generates reports at any time in the form of graphs or tables.

The generated reports of the network and resource utilisation help in determining different parameters – from the daily main traffic hour up to the medium-term and long-term trends as well as the change in utilisation behaviour of the network subscribers.

This information can subsequently be utilised for planning a network optimisation. The evaluations support in detecting temporary faults or faults recurring over extended periods of time and thus permit the prompt initiation of appropriate troubleshooting measures.

NMC-513 PerformanceManager

For the visualisation of key performance indicators (KPI) in ACCESSNET®-T IP, the NMC-513 PerformanceManager provides numerous report functions for the network analysis.

The NMC-513 PerformanceManager accesses performance data in the network databases (NDB) and generates reports in the form of tables or progression charts.

The reports can be created for different time periods and enable targeted analyses of the ACCESSNET®-T IP. In addition, reports of specific performance data can be defined, stored and adapted for special analysis purposes.
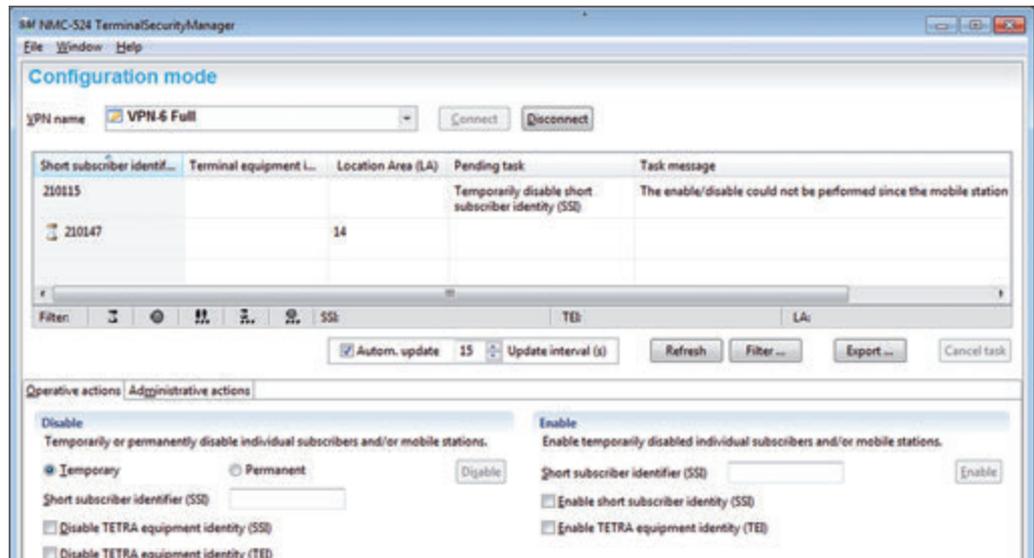
Security management

The security management in ACCESSNET®-T IP enables the central management of all safety functions.

The safety functions ensure the greatest possible confidentiality and integrity and protect the network with encryption and authentication against unauthorised use and access to the transmitted calls and data.

In addition to the security services in the ACCESSNET®-T IP , the Network Management System provides further security functions, with the aid of which the user activities are monitored (logging) and changes on the data stock can be traced (audit trailing). This enables the NMS to recognise and remove inadvertent changes or manipulations of the TETRA system.

NMC-514

In the ACCESSNET®-T IP, the network management client NMC-514 is used for managing and generating authentication parameters. In addition, the static cipher keys required for the air interface encryption are generated and administrated via the NMC-514.

NMC-524 TerminalSecurityManager

The network management client NMC-524 TerminalSecurityManager is used for disabling and enabling mobile stations within the ACCESSNET®-T IP. The may be necessary, e.g. to prevent improper use of lost or stolen mobile stations.

Displaying user activity

In order to retrace activities of NMC users, the user actions are in the network database. The network management client NMC-541 UserManager is available to display user activity.

Audit trailing

Changes to the subscriber data stock of the network database can be stored together with information about the author of the change and analysed. This allows retracing changes to the subscriber data, e.g. for fault removal.

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