Contents

Friendly Management
Flexible Software Architecture
Radio Networks
Configurations
Graphical User Interface
Open Interfaces
Features Overview

NetViewer NME Suite
The development of different Open Interfaces and additional modules for NetViewer, each of them provided with specific features, is pursued by NetViewer NME Suite. So the Suite includes the standard NetViewer, as Element Manager, and highlights the concept to make available Open Interfaces for the integration with Third Party (Multi-vendor) OSS and with Radio Commander, the mobile Siemens OSS. Furthermore the portfolio includes products already available of Third Party OSS, such as HP OpenView NNM, HP Compaq TeMIP, etc, customized for NetViewer Open Interfaces.

NetViewer Element Manager
NetViewer is a new versatile TMN product for the management of SDH, PDH, Point-to-Multipoint Radio. Also devices of different vendors based on SNMP protocol can be managed by NetViewer. The flexible Software architecture is a simple way for increasing its functionalities and for adding new Network Elements to be managed.

An overall view of the complete Network structure with its easy-to-understand network view and its ability to zoom down to the Network Element details give a clear understanding of the Network, its configuration and events.

Full FCAPS functions are implemented:
- Fault
- Configuration
- Administration
- Performance
- Security

NetViewer meets all the requirements for following the network growth satisfying in such a way customers’ demands.

The use of standard OSI protocol guarantees the compatibility of mixed network with SDH Radio and SDH Add-Drop Multiplexer of different vendors.

Following the communication evolution NetViewer supplies the web interface, allowing the users to access NetViewer via Internet and Intranet using Browsers such as Netscape® and Microsoft Explorer®.

Email messages are sent by NetViewer when the summarised alarm threshold exceeds the value set by the user.

NetViewer Open Interfaces
As required by the market NetViewer is supplied with a northbound open interface for its integration into the upper TMN. The interfaces are:
- SNMP Agent
- TCOA Agent
- OSS/J API
Friendly Management

NetViewer is a scalable system for giving customised, cost-optimised network management solutions.

The NetViewer system platform comprises standard PCs under Microsoft Windows 2000®, 2003® for reduced costs and increased simplicity.

The user interface, developed with the "look and feel" of standard Windows applications, is designed for intuitive operation. This increases efficiency and reduces staff training time.

NetViewer supports different interfaces to the Data Communication Networks (DCN) giving a wide level of freedom for creating networks of different sizes. For controlling DCN, often designed with devices based on SNMP protocol such as routers and interface converters, the SNMP device management performed by NetViewer is the only approach for having a complete TMN of all the Network Elements included in the network.

Features
- Integrated network management for SDH, PDH, Point-to-MultiPoint Radio Network Elements
- Management at network and network element levels
- Fault, configuration, performance and security management
- Subnetworks management
- Standard interfaces for communication with the Network Elements
- Java client
- Web interface for Internet Browsers
- Web interface for Palmtop
- Redundant standby system
- Email messages for alarm notification
- Southbound in SNMP Interface for managing devices using SNMP protocol
- SNMP, TCOA, OSSJ API interfaces to upper TMN

NetViewer is a scalable system for giving customised, cost-optimised network management solutions.

The NetViewer system platform comprises standard PCs under Microsoft Windows 2000®, 2003® for reduced costs and increased simplicity.

The user interface, developed with the "look and feel" of standard Windows applications, is designed for intuitive operation. This increases efficiency and reduces staff training time.

NetViewer supports different interfaces to the Data Communication Networks (DCN) giving a wide level of freedom for creating networks of different sizes. For controlling DCN, often designed with devices based on SNMP protocol such as routers and

Fig.1 - Alarm list: table view

Fig.2 - NetViewer and Open Interfaces
Flexible Software Architecture

NetViewer is endowed with a very flexible software architecture. TMN has always been considered only a software package where the Network Elements and functionalities were introduced in every new release with weary controls.

With NetViewer no more troubles: the core software is the Engine with the common parts and the main features. The Network Elements to be managed are plug-in software modules separated by the Engine. These plug-ins have to be added to the Engine and are released independently from the Engine itself at different dates.

A new Network Element is managed by an installed NetViewer release simply loading its relevant plug-in.

This plug-in, though released after the Engine, works correctly because is designed with a compatibility concept.

For increasing functionalities additional package software are available and can be designed respecting the same compatibility concept used for plug-ins. With this philosophy for example SDH Radio and SNMP device management were introduced into NetViewer.

Another big advantage of this architecture is that it is open to the customers' needs: it is only necessary to design a new software module and to install it into NetViewer.

**Fig. 3 - Flexible Software Architecture**
Radio Networks

NetViewer is designed for small and large networks and can be configured for customised networks.

The management of SDH, PDH, Point-to-Multipoint and SNMP devices offers the central supervision and configuration of the entire network, including the DCN.

Typologies of networks:
• only SDH Radio
• SDH Radio with SDH multiplexer
• only PDH Radio
• only Point-to-Multipoint
• mixed consisting of the ones mentioned above.
It can also include SNMP devices.

Fig.4 - Utran - SRAL XD Network

The evolution of NetViewer
NetViewer is structured for its continual evolution for expanding the range of network elements and increasing its functionality thus ensuring future longevity and cost-effectiveness of the system.

Fig.5 - Transport Network
Configurations

The Network Management System NetViewer is designed as a multi-user system with a Client/Server architecture.

The system hardware includes one or more standard PCs; Microsoft Windows 2000/2003 are used as operating system.

Entry configuration
The Entry manages small networks: NetViewer client and NetViewer server, the functional parts of the software, are installed on a single PC (fig. 6). It is available also for Notebook.

Single-Server configuration
The Single-Server is relevant to medium networks. Client and Server functional parts are installed in different PCs. (fig. 7).

Multi-Servers configuration
The Multi-Servers concerns large networks distributed in a wide geographical area. More Servers are working (fig. 8) contemporarily: one is configured as MAIN and the others are additional ones. Each Server can be equipped with Clients: the Clients assigned to the MAIN Server are the interface for the administration of the whole network. If it is required to assign one or more Clients to each Server, they become the management interface for the part of the network connected to each Server.

NetViewer Server
The NetViewer Server is the main component of the NetViewer. It contains all the management functions for the network.

The Server stores all the data for the network level plus the log data items.

In addition, the Server supports:
• the northbound open interfaces to a upper level management system
• the web interface for allowing Internet access via Browsers
• Microsoft Access or in alternative Microsoft SQL Server 2000 SE (Standard Edition).

Fig. 6 - NetViewer Entry configuration

Fig. 7 - NetViewer Single-Server configuration
**NetViewer Client**

The NetViewer Client is the operator interface. This gives access to all the management functions of the NetViewer Server or the Master Server in case of Multi-Server configuration.

In addition, the Client contains the element management applications for the individual types of network elements. The user interface provided for the operator is identical to the operator interface of the local LCTs (for all Network Elements in the Radio Management family).

Several NetViewer Clients can be driven at the same time by one NetViewer Server.

**NetViewer Java Client**

Java Client is one of the latest features added into NetViewer. It is possible to install it into a PC with different operating systems such as Unix.

---

**Fig. 8 - NetViewer Multi-Servers configuration**
Data Communication Networks (DCN)
The logical linkage of data communication networks (DCNs) to the NetViewer is performed by the following interfaces:

- TNMP/OSI (Ethernet) for SDH Radio
- SNMP/UDP/IP (Ethernet) for Point-to-Multipoint Radio and SNMP devices (e.g. routers, interface converter)
- TNMP/TCP/IP (Ethernet or RS485)
- TL1/TCP/IP (Ethernet)

Data Base
The data storage of NetViewer is optimised for high performance. All data are stored in the Master servers, but each slave server has also its own database.

The direct access to the database for the NetViewer web interface is very useful: so from remote sites it is possible to know via Internet the status of the server.

The NetViewer user interface supplies tools for data processing, visualising and saving.

The data are stored with the formats:
- MS Access 2000
- MS SQL

The data can be exported to external relational databases.

Data safety
NetViewer has different means to ensure high requirements for data safety.

The NetViewer Servers can be equipped with duplicated hard disks and a SCSI RAID controller system for disk-mirroring function. This allows the failure of an individual disk to be handled without interrupting operations.

The NetViewer is also supplied with a streamer system. This means, for example, that daily data backup can be carried out without interrupting operations.

The NetViewer can be supplied by a standby system. This allows to cover failures up to the complete server. In such an event, data must be restored from the latest data backup.

User Management
Users can be configurated for each of the NetViewer classes. The creation of new users is activated by dedicated menu.

Fig. 9 - NetViewer Database can be managed by a remote PC installing MS SQL Server 2000 SE (Standard Edition) or Enterprise

Fig. 10 - Database view
Graphical User Interface

User interface
NetViewer provides a standard graphical user interface. The user accesses all functions of the system via the Client:
- network level management functions
- network element level management functions.

Operational activities are carried out working on the Network map of NetViewer. All the functions are supported graphically thanks to the WINDOWS user interface and are designed for working simply and intuitively.

The management functions of NetViewer can be called up via the menus available clicking on network element as well as via the standard Windows menus Window and Help.

The Java GUI of NetViewer Client
The screen of Java GUI is divided in 3 parts:
- the Map. All the NEs of the network are here reported
- the Tree View of the Map. For a quickly access to the NEs
- the Tree View of the NE. The window allows the access to the NE selected from the Map or from the Tree View of the Map.

"Find" function is available and "direct access to the NE" is possible from the Alarm list, History Report and Performance Report.

Network level management functions
For the network level management functions, the entire network is shown graphically as well as the color of the icons summarising their status. Geographical network maps can be defined by the operator.

All the available functions are selected by the mouse. The subnetwork tree of the subnetworks helps the user in administering the network.

Network element level management functions
The network map gives direct access to the network element level.

At this level, the user interface is identical to an LCT's one and can be used to execute the same functions as those performed locally.

Access to NetViewer via Internet with Browsers
The web interface allows a simple access to NetViewer via Internet using Browsers (fig. 11). In such a way it is very easy to understand the status of the NetViewer Network and configure the Radio Net Elements via an Internet connection using the web client. A special version of web interface was developed for the Palm Top (fig. 12).

Email notification
Email messages are activated for notifying alarm network status. A threshold is set by the user.
Open Interfaces

The Northbound Open Interfaces allow the integration into Third Party and Siemens OSS. The Open Interfaces are:
- SNMP Agent
- TCOA Agent
- OSS/J API

SNMP Agent
The SNMP MIB is in compliance with RFC 1212, RFC 1213, RFC 1155, RFC 1157. SNMP V1 interface is implemented. The messages are encapsulated in the UDP/IP. This interface is the base for the integration into the OSS:
- Siemens Radio Commander BR/UMR
- HP Open View NNM (Network Node Manager)
- HP Compaq TeMIP

TCOA Agent
It implements the Element Manager ↔ Network Manager interface and acts by definition in a multi-vendor environment (MTNM). It respects the Tele Management Forum specs. for MTNM (previous Go6/Go7 specs). The Information Model is standard, agreed among hundreds of members of TMF. This interface is the base for the integration into the OSS:
- Siemens TNMS Core

OSS/J API
The OSS through Java Initiative ("OSS" stands for "Operation System Support") produces a standard set of Java technology-based APIs to jump-start the implementation of end-to-end services on next-generation wireless networks, and leverage the convergence of telecommunications and Internet-based solutions. This interface is the base for the integration into the OSS:
- Watchmark Prospect

Fig. 13 - NetViewer in HP OpenView NNM

Fig. 14 - NetViewer in HP Compaq TeMIP
Features overview

**System architecture**
- Scalable within wide limits (similar to ITU-T M.3010)
- Flexible with plug-ins and additional functional modules
- Client/server architecture

**Capacity**
- Multi-user option: up to 20 Clients simultaneously
- Multi-Server option: up to 10 Servers simultaneously
- Network size: small to large up to 5000 NEs
- Single server up to 1000 NEs

**Network elements managed**
NetViewer manages the Radio products of Radio Management Family from Siemens Mobile Communications:
- SDH equipment for Trunk and Access
- PDH equipment for Low Capacity
- Point-to-Multipoint equipment
- SNMP devices

**Data Base**
Database is stored with format:
- MS Access 2000
- MS SQL

Third Party database can be installed:
- MS Access 2000
- MS SQL Server 2000 SE

**Software platform**
- Windows 2000
- Windows 2003

**Hardware platform**
- Standard PCs
- DCN: TNMP/OSI (Ethernet), TNMP/TCP/IP (Ethernet or RS485 Bus), SNMP/UDP/IP (Ethernet)
- TL1/TCP/IP (Ethernet)

**Northbound Open Interfaces**
- SNMP Agent
- TCOA Agent
- OSS/J API

**Reliability**
- Protection against total failure with warm standby
- Redundant hardware with disk-mirroring
- Data backup

**Web interface**
An user web interface is available for allowing Internet access to NetViewer

**Email service**
Netviewer provides Email alarm notification

**Java client**
The way to be independent from the Operating System

**NetViewer & Radio Commander**
NetViewer, with the additional SW module Radio Commander Add-on, is integrated with Radio Commander BR/UMR

**NetViewer & TMNS Core**
NetViewer, with the additional SW module TNMS Core R allows to TNMS Core itself to manage directly the radio together with SDH multiplexer

**Module for Third Party OSS**
The module for the integration in the NetViewer with Third Party OSS is available:
- HP Open View NNM (Network Node Manager)
- HP Compaq TeMIP
- Watchmark Prospect
Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCN</td>
<td>Data Communication Network</td>
</tr>
<tr>
<td>NetViewer</td>
<td>Radio management System</td>
</tr>
<tr>
<td>GUI</td>
<td>Graphical User Interface</td>
</tr>
<tr>
<td>HTTP</td>
<td>Hyper Text Transmission Protocol</td>
</tr>
<tr>
<td>ITU-T</td>
<td>International Telecommunication Union –Telecommunication Standardization Sector</td>
</tr>
<tr>
<td>LAN</td>
<td>Local Area Network</td>
</tr>
<tr>
<td>LCT</td>
<td>Local Craft Terminal</td>
</tr>
<tr>
<td>MIB</td>
<td>Management Information Base</td>
</tr>
<tr>
<td>NMS</td>
<td>Network Management System</td>
</tr>
<tr>
<td>NNM</td>
<td>Network Mode Manager</td>
</tr>
<tr>
<td>ONMS</td>
<td>Optimized Network Management System</td>
</tr>
<tr>
<td>OSS</td>
<td>Operation Systems Support</td>
</tr>
<tr>
<td>PDH</td>
<td>Plesiochronous Digital Hierarchy</td>
</tr>
<tr>
<td>RAID</td>
<td>Redundant Array of Independent Disks</td>
</tr>
<tr>
<td>SDH</td>
<td>Synchronous Digital Hierarchy</td>
</tr>
<tr>
<td>STM</td>
<td>Synchronous Transport Module</td>
</tr>
<tr>
<td>SMA</td>
<td>Synchronous Multiplexer Add/Drop</td>
</tr>
<tr>
<td>SNMP</td>
<td>Simple Network Management Protocol</td>
</tr>
<tr>
<td>TMF Corba</td>
<td>Tele Management Forum Common Object Request Broker Architecture</td>
</tr>
<tr>
<td>TMN</td>
<td>Telecommunications Management Network</td>
</tr>
<tr>
<td>TNMP</td>
<td>Trivial Network Management Protocol</td>
</tr>
<tr>
<td>WAN</td>
<td>Wide Area Network</td>
</tr>
</tbody>
</table>

Siemens Mobile Communications S.p.A.
Sales Office
Viale P. e A. Pirelli, 10
20126 Milano - Italy
Phone + 39 02 243 1

This publication is issued to provide information only and is not to form part of any order or contract. The products and services described herein are subject to availability and to change without notice.