

NetLink

Remote control and monitoring of transmitters on the Internet

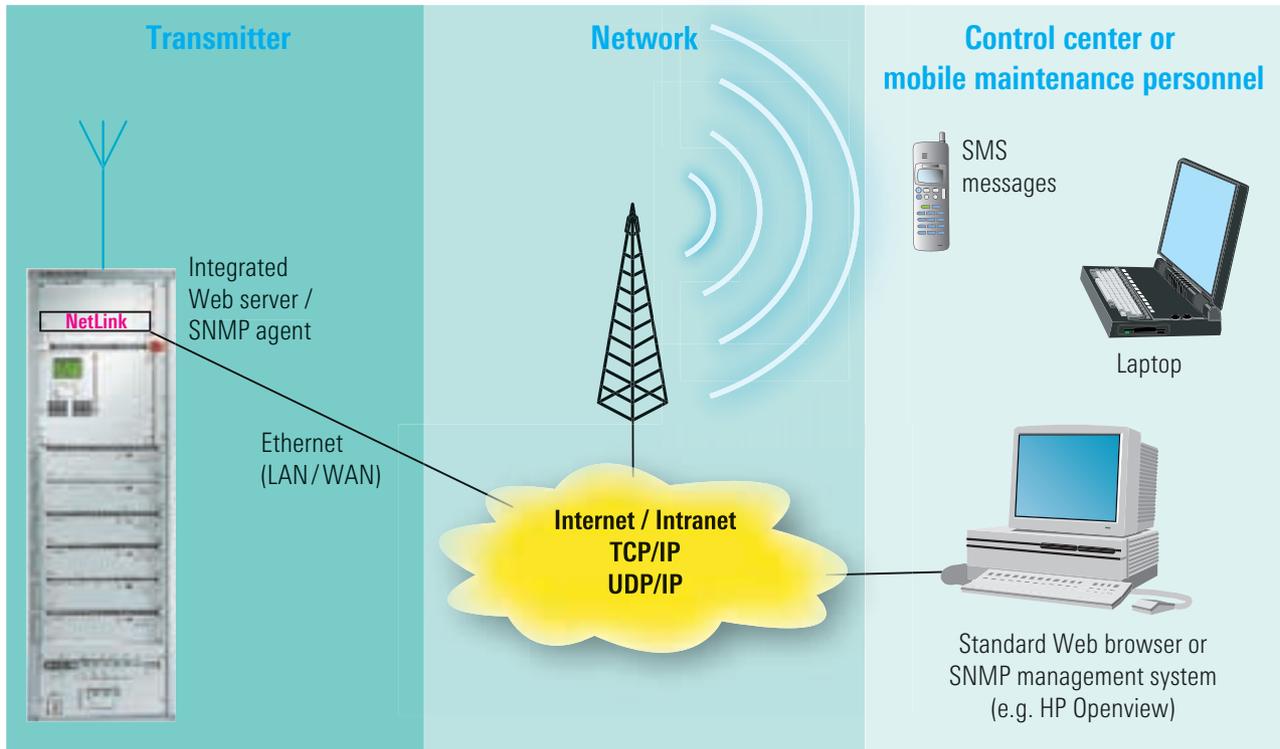


FIG 1 Example of linking a transmitter through the Internet

With NetLink, Rohde & Schwarz is worldwide the first transmitter manufacturer to offer an essential module for service-oriented, standardized remote control and monitoring of broadcast equipment units.

Access to all components

The future-oriented concept of NetLink meets both, the requirements of a control center and the expectations of decentralized mobile maintenance personnel. The integrated Web server allows access to components of broadcast equipment from the World Wide Web. An SNMP agent ensures connection to a full-coverage network management system and the powerful API (application interface) is the base for future tasks in component-based applications. NetLink is designed as an open platform, so it is the ideal solution even for other components of broadcast equipment in addition to analog TV, DVB-T, DAB and FM transmitters.

NetLink is perfectly integrated in the new TV transmitter family NX7000, which has established itself worldwide as a reference product for terrestrial broadcasting [*], in no small part because of features that guarantee 24-hour operation such as high reliability, integrated redundancy and ease of maintenance.

The new transmitter technology provides all the conditions required by network operators to fully meet all market requirements. Against a background of deregulation, the convergence of broadcasting and telecommunications and the rapidly advancing implementation of digital (DVB-T and DAB) transmitter networks, network operators are facing completely new challenges.

► A growing number of stations are unmanned for reasons of cost, but content providers ask in more and more restrictive agreements for network availability that in unattended stations can only be achieved with a mature and future-oriented concept for remote control and network monitoring. In this connection one has to remember that as a result of liberalization different network operators often share one transmitter site, so monitoring a complete station may not always be the right solution.

Remote control and monitoring of transmitter systems concentrates on the following three basic requirements:

- Visualization of all components (globally for the control center and in detail for maintenance personnel)
- Reporting (availability data, error statistics, configuration)
- Information (event-triggered alarms from the transmitter to a control center or directly to maintenance personnel)

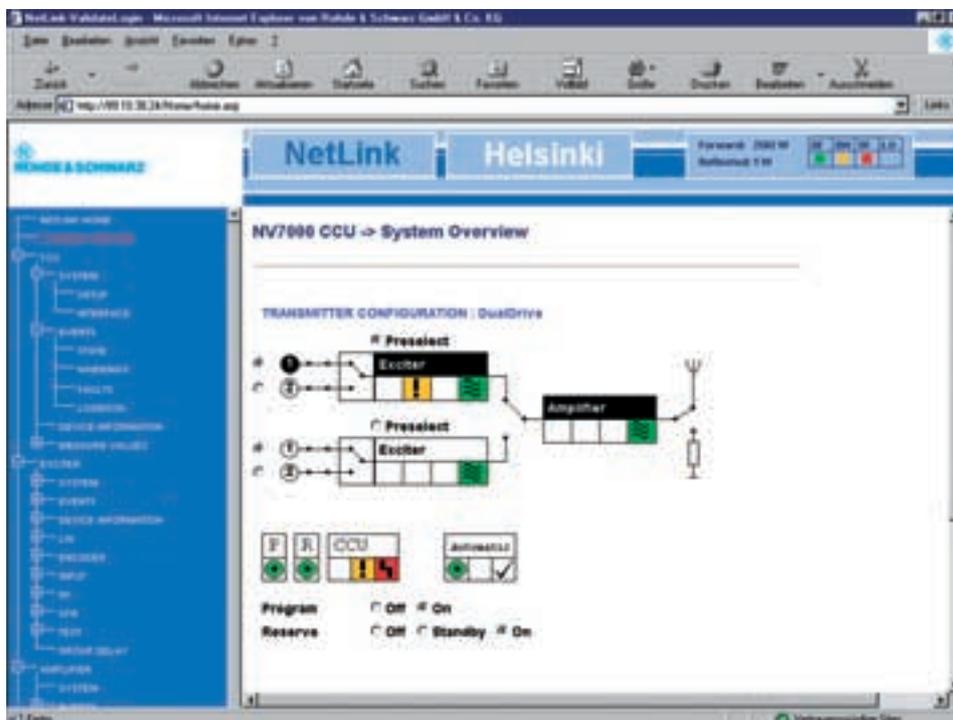
This is where NetLink comes in with its comprehensive solutions. Since most transmitter stations are at exposed locations and difficult to reach, automatic error signalling and the possibility of detailed remote analysis are essential requirements for a fast and efficient deployment of maintenance. Standard network protocols (TCP/IP and UDP/IP) running on the available infrastructure (LAN, WAN, Internet via analog or ISDN telephone lines or GSM) can be used for communication between the personnel (client side) and the system (server side). A major advantage of this is that standard software (Web browser or SNMP management platform) can be used at the client end instead of the previous proprietary solutions that require intensive development and whose reusability is low.

NetLink is an important link to future-oriented Web over DTV technology. It is installed at the hand-over points to the broadcast networks and provides the availability information required for content transmission to subscribers (content routing). Further applications are described in the feature article on page 24 ff.

Web interface

The Web server integrated in NetLink enables direct access to system data through a conventional Web browser (FIG 1). This makes the user independent of platform and location, which is particularly important for mobile maintenance personnel. The structure of the Web interface allows accurate and fast navigation (FIG 2). Helpful links for online product description or a product hotline enhance the benefit for customers and pave the way for an integrative service concept.

FIG 2 A standard Web browser gives access to all data of the transmitter system



An important feature when connecting a system to the Internet is security. Thanks to its extensive modular design, NetLink offers all mechanisms the user may require, from simple authentication through to complete encryption of data traffic to SSL (secure socket layer) standard. Any access to the network from the outside is recorded according to the CERN/NCSA standard for server log files and can be analyzed by the administrator.

SNMP interface

The SNMP (simple network management protocol) standard, which is well established in telecommunications, links a control center via the network to the

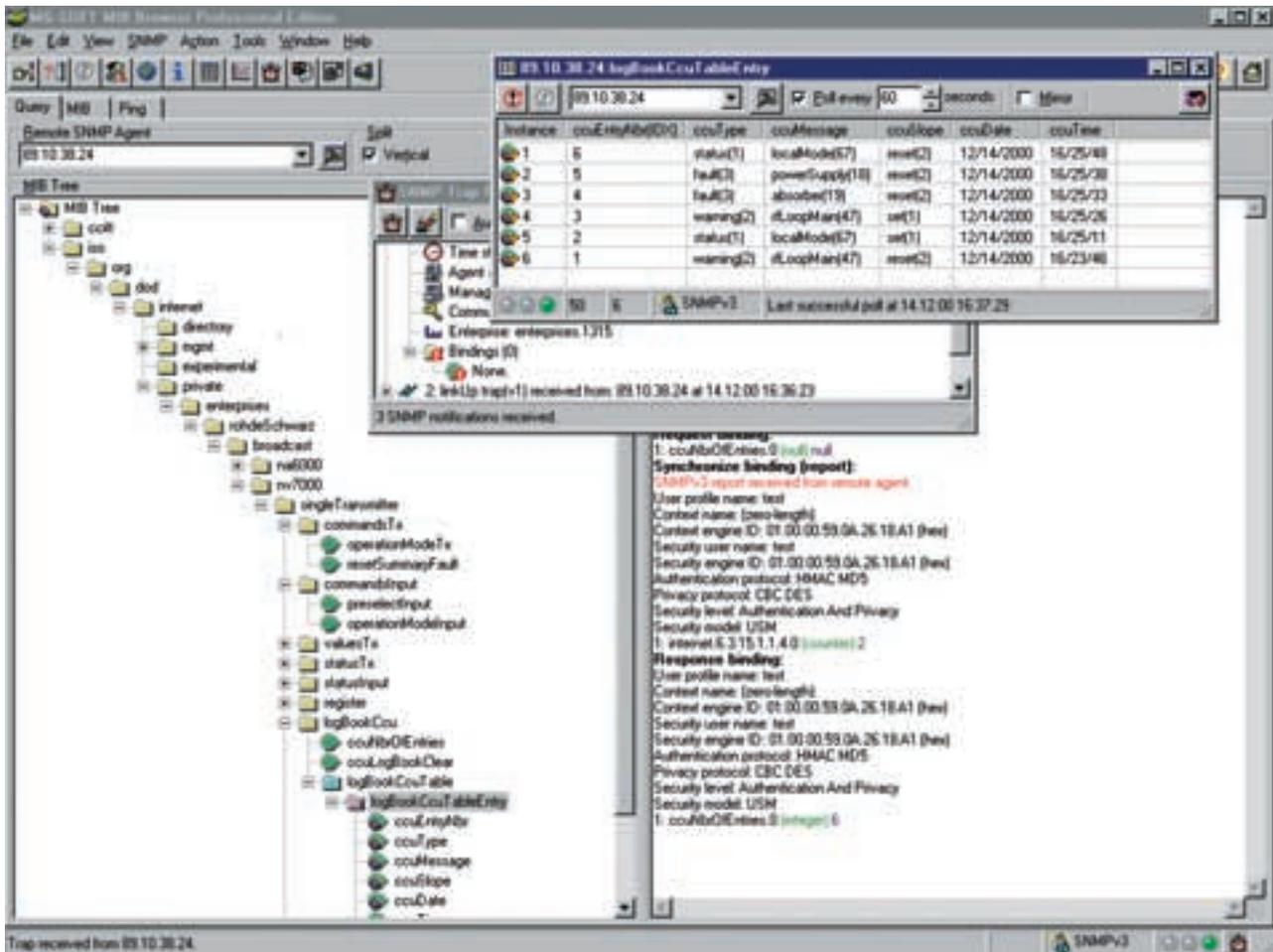


FIG 3 Structure of SNMP MIB with logbook and traps

transmitters to be monitored (FIG 1). The SNMP agent is the counterpart to the Web server in the system. Its task is to make data available by means of set and get commands and to automatically signal special events to the control center by way of traps. NetLink offers 32 specific traps that can be individually activated and deactivated from the control center.

The full functionality of the SNMP interface is defined in the management information base (MIB) in the form of a hierarchic tree structure and published using a method standardized by RFC 1066 (request for comments). New components can thus be integrated in the control center by simply loading the MIB file.

NetLink supports the three common SNMP versions v1, v2c and v3. The current version v3 now also takes security aspects into account: user authentication to MD5 standard and encrypted data transmission in line with DES (data encryption standard).

The modular design of the SNMP agent within NetLink simplifies system upgrades to the latest SNMP versions or new Internet standards (eg IPv6).

For all transmitters

The NetLink option provides network operators with a future-oriented and economical solution for system monitoring, remote maintenance and central log-

ging of data measured in their networks. NetLink is available for the TV/DVB transmitter families NH/NV 7000/6000/500, for the DAB transmitters of the NA/NL 6000 family and on request also for FM transmitters from Rohde & Schwarz.

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Reader service card 170/08

REFERENCES

[*] UHF Transmitter Family NV/NH 7000 - Liquid-cooled TV transmitters for terrestrial digital TV. News from Rohde & Schwarz (1999) No. 165, pp 11-13