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NEW WAYS OF ACCESS FOR ANALOG AND ISDN CUSTOMERS OF ETV

BETTER AND MORE RAPID CONNECTIONS

The access to the electronic subscriber directories (ETV) for users of analog modems, via 157 11 11, was upgraded to the latest technology in January, 1996. In April, the next step followed, with preparatory work for a new access for ISDN users via 157 11 41. In this article, both projects, realized by PK12 and IK22 in cooperation with external partners, will be presented.

ROLF GERBER AND PIERRE VISCONTI, BERNE

In 1993, access to the electronic subscriber directories (ETV) was installed via 157 11 11 (Fr. –.86/min) for users of analog modems. On ETV, all phone, fax and postal account numbers of Switzerland and the Principality of Liechtenstein are available. Several user-friendly software packages of third-party suppliers – Nova Esprit (ETV for Windows), Furrer & Partner (ETV connect), Twix (ETV on-line) – make this Telecom service even more popular.

Access to the electronic subscriber directories (ETV) via modem

While the professional users of ETV mainly access the system via X.25-TELEPAC, individuals, small firms, and some departments of bigger organizations (e.g. marketing) prefer to access the system directly with an analog modem via telephone 157 11 11.
Until the end of January, 1996, customer calls were directed to the Unidata data transmission network TELEPAC (X.28-PAD). The speed of these modems, 2400 bps, was insufficient and did not meet the customers' needs. To improve the situation, a new technical solution had to be found. With regard to the new access via ISDN, it had to be possible to access the computing center of ETV directly, rendering TELEPAC unnecessary (figure 1).
Customers increasingly emphasized their need for faster and more reliable ways of connection with the ETV computer, in particular modems from 9600 to 28 800 bps (V.34), and access via ISDN.

Possible new solutions

New modems are much faster than the older ones and the transmission is of a much higher quality. This was achieved by the standardized elimination of faults and by data compression. Therefore, Richard Erismann, the manager of the project ETV, acted fast and decided to find a trend-setting solution. The following points were defined as essential requirements:
- modems receiving customer calls have to be located in the computing center of Telecom
- direct connection on LAN segment (TCP/IP on RS/6000)
- hot swap technology in the most important components (the components can be exchanged while in use)
- flexible configuration and enlargement
- easy wiring
- the system has to be redundant
- monitoring of the system via SNMP
- protection of investment by supporting future technologies
- modularity and scaleability
- cost efficiency
- the individual components have to be easily available

Application of new technologies, evaluation of different producers

The computing center of ETV, the experts of the General Directorate PTT in Berne, and an external firm (Nova Esprit Ltd., Volketswil), evaluated the available technologies and examined various variants at very short notice. In November, 1995, and in cooperation with Nova Esprit Ltd., several producers of modem rack systems and network access systems were familiarized with the task.
After a first selective procedure, the products of Motorola, Zyxel, Cisco, and

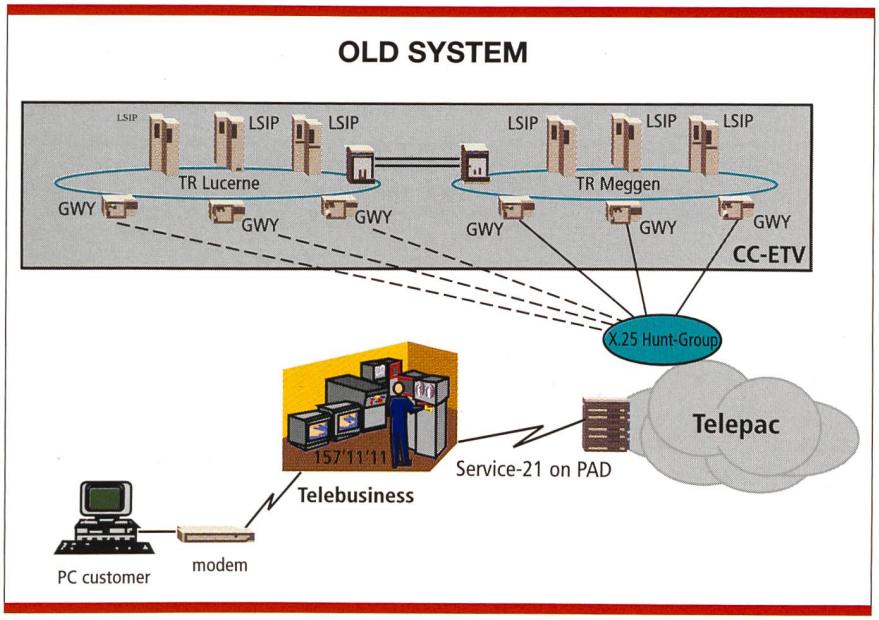

Fig. 1. Old system 157 11 11 via TELEPAC.

US Robotics qualified for closer consideration. Only Motorola (Modulus) and Zyxel offered modem racks that could be connected to the LAN segment by separate wiring and terminal server systems. Cisco (Access Server AS5100) and US Robotics (Totalcontrol) not only offered modem rack functions but also net server and net management systems that can be inserted into the same 19" rack system. One significant advantage of this type of system is that it does not need additional wiring because the rack system is directly connected to the LAN (10base-2, 10base-5, 10base-T, or token-ring). At the time of evaluation, only US Robotics was able to supply the needed system.

The decision: in favor of US Robotics Totalcontrol

After carefully evaluating the test system in December, 1995, and running it until mid-January, 1996, preference was given to US Robotics and their system Totalcontrol. The equipment was available at very short notice and could be tested thoroughly. Thus, it was possible to open the system for general use on February 1st, 1996. In this compact system, a large number of modems can now directly access the electronic subscriber directories (ETV; figures 2 and 3).

US Robotics Totalcontrol

Characteristics

The most important characteristics of Totalcontrol are:
- a standard 19" rack system with as many as 64 modem lines V.34 or 240 ISDN lines per chassis
- direct connection to LAN (Ethernet and/or token-ring) by means of NET-server cards (combination of modem rack and terminal server in one chassis)
- high system performance (modern V.34 modems, fault elimination protocol, mid-plane bus architecture)
- hot-swap functionality in all components
- vast choice of application cards (ISDN, modem, X.25, LAN/WAN)
- all application cards equipped with a processor and flash-ROM
- local and remote administration
- support of higher communication protocols, such as PPP, SLIP, TCP/IP, Telnet, Rlogin, NETX/IPX
- dial-in and dial-out network access
- extensive security system
- extensive filtering methods that can be configured per port
- the log-in can be configured for up to 9 different host addresses per port (including fail-over addresses)
- SNMP-MIB-II support for HP Openview, SunNet Manager, and IBM NetView 6000 (examples)
- support of DNS (Domain Name Service) and NIS (Network Information Service)

Architecture

Chassis

The chassis of Totalcontrol consists of two parts: The part of the interface

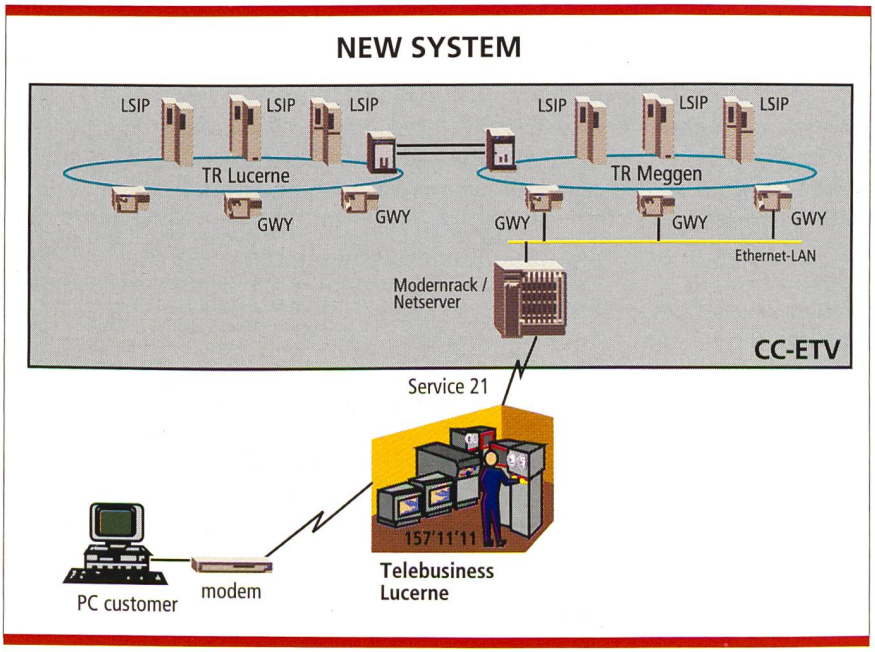

Fig. 2. New system: direct access of the modem rack at the computing center of ETV.

card and the part of the application card, to which a mid-plane bus is added. There are two power-supply slide-in units as well as one SNMP slide-in unit, and 16 slots are free (figure 4). The interface cards make it possible to establish contact with the 'exterior' (e.g. telephone lines and RS-232 asynchronous for analog modems, ISDN primary access for E1 cards, TELEPAC X.25 access for X.25 cards, LAN/WAN for network access cards). Modem cards, ISDN primary access cards, X.25 cards, and NETserver cards can be used as application cards. With a NETserver card it is possible to access LAN.

Mid-plane bus
Totalcontrol disposes of a very efficient bus architecture. The mid-plane bus consists of the following system busses:

- TDM bus: 16-Mb/s serial bus for communication between primary access cards and modem cards
- Packet bus: 1-Gb/s-32-bit parallel bus for communication between modem cards and the various gateway cards (LAN/WAN, X.25)
- Network management bus: 16-Mb/s synchronous serial bus for communication between network management card and application or interface cards (one separate connection to the management card for every network interface card and network application card)
- General purpose bus: 256-Mb/s bus reserved for future applications

NETserver hardware
NETserver is a very efficient communication card for accessing LAN. The card has an INTEL-486/33 processor and 4 MB dynamic memory as well as 2 MB non-volatile flash-ROM (can be extended to up to 20 MB). The card can hold 60 connections simultaneously.

ISDN
Connection to ISDN primary access is established by means of two components. First, there is the primary access card (two units with 30 channels each). Secondly, there is the NETserver-60 card with ISDN complement (daughter card). Thus, with only two slide-in units, a total of 60 ISDN access lines can be offered. It is possible to have four pairs of cards per chassis (primary access and NETserver card), which allow a maximum of 240 simultaneous connections.

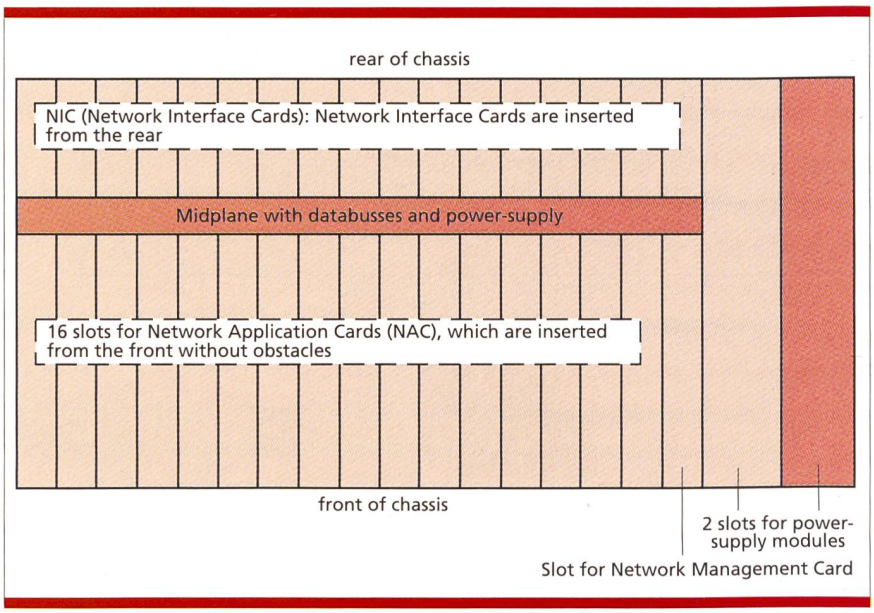

Fig. 3. System architecture of US Robotics Totalcontrol.

Course of the project, costs, return on investment

The most important contribution to this project in terms of realization comes from the specialists at the computing center of ETV. Only thanks to their efficiency in adapting the software of the ETV gateway computer was it possible to start using the system so quickly.
The efficient cooperation of the hardware-supplier (Comlight Ltd.) enabled Nova Esprit to complete the project on schedule (in November, 1995, it was laid down that the new system would be put into service on January 31st, 1996) and exactly according to the budget.
Installations for modems and for ISDN primary access were relatively modest investments. With the elimination of TELEPAC between modem and RS/6000, it was possible to simplify communication considerably. Return on investment is expect to be achieved in far less than twelve months.

Efficient project management, commitment of the parties involved

Thanks to the commitment of the project team in general and of the responsible managers in the computing center of ETV in particular, the new accessing system could be extensively tested and realized in only two months. For our customers, this significant project means that the service they use is now equipped with a top modern V.34 modem and all the conventional functions. Therefore, connections are handled more rapidly and are of a higher quality.

What has changed for the customers of ETV?

Without having to adapt their software installations, PSTN customers can enjoy many advantages:
- the connection is built up more rapidly (the customer receives the desired answer an average three to four seconds after the modem handshake)
- higher quality of the connection thanks to the standardized elimination of faults (MNP4, V42 bis)
- higher speed of transmission (with V.34, the customer receives as much as four times the amount of information as before); with the efficient usage of data compression this can probably be improved even more

The new ISDN access on ETV via 157 11 41 (Fr. –.86/min), which started operating in August, 1996, further accelerates the connection and offers even faster access. In addition to this,

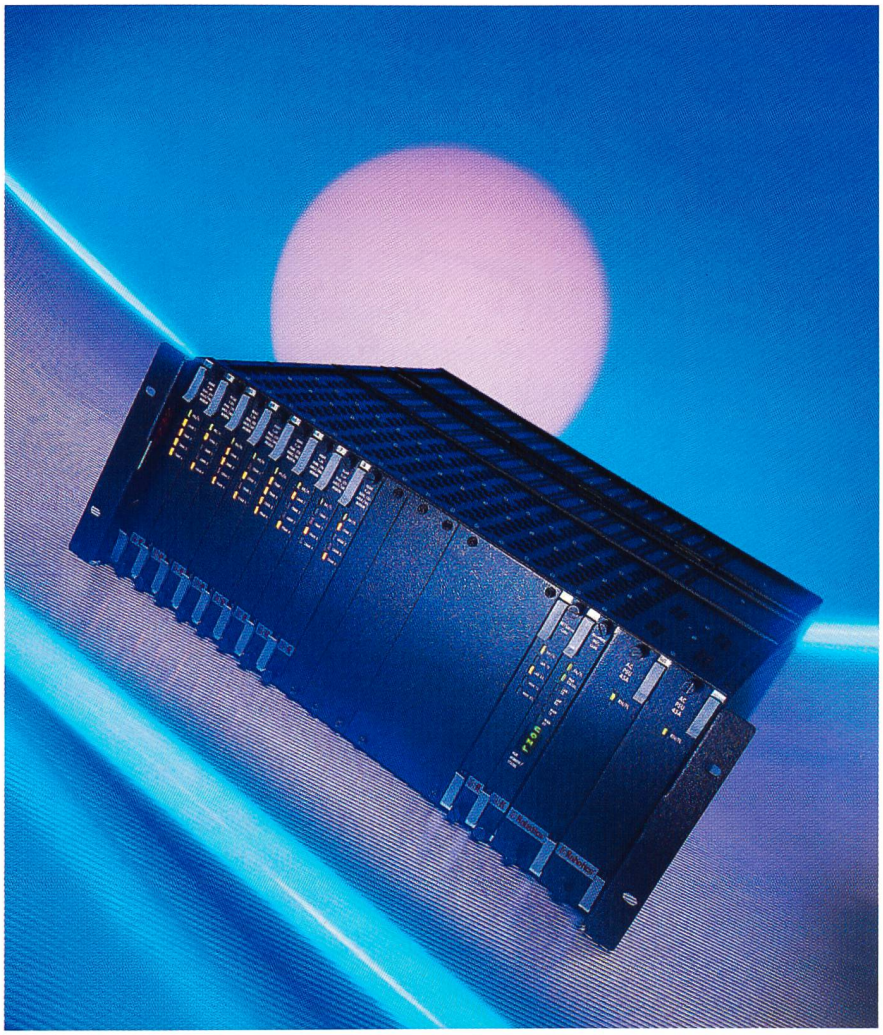

Fig. 4. 19" chassis (photograph by Comlight).

ZUSAMMENFASSUNG

Neue Kommunikationszugänge für Analog- und ISDN-Kunden von ETV

Die Zugänge zu den elektronischen Teilnehmerverzeichnissen (ETV) für Benützer von analogen Modems, welche über Telefon 157 11 11 erfolgen, wurden per Ende Januar 1996 auf den neuesten Stand der Technik gebracht. Im April begannen dann als nächster Schritt die Vorarbeiten für die Inbetriebnahme des neuen Zugangs für ISDN-Benutzer unter der Nummer 157 11 41. Der Artikel beleuchtet diese beiden Teilprojekte, die von PK12 und IK22 in Zusammenarbeit mit externen Partnern realisiert wurden.

a helpdesk has been installed for the customers of ETV, where competent specialists assist customers' needs. The helpdesk is accessed via 157 56 66 (Fr. 2.13/min).

The (near) future

The responsible managers of the General Directorate Telecom are very satisfied with the outcome of the project. Customer satisfaction has significantly increased thanks to the improved quality of access. Faster connections make ETV cheaper, and the new infrastructure of communication simplifies the realization of future ways of access. Even from the first day of operation customers who were delighted with the fast connections gave spontaneous positive feedback.
Based on the new communication platform, it will now be examined wheather or not alternative ways of access can be realized in the near future. In this connection, emphasis is placed on access from the Internet and on extraordinary ways of access, such as Teleguides (which replace telephone directories in telephone booths). [7]

Rolf Gerber, head of services. After he finished training at the cantonal school for traffic and administration in Biel, he was trained to become a dispatcher and worked as such for the Swiss Federal Railways SBB. He received training in several other specialized areas, which enabled him to work in the SBB travel agency and other departments. As of 1990, he started work with Telecom PTT, where he is responsible for the commercial side of the electronic subscriber directories ETV. He concentrates on further ways of access to ETV (access via Internet, ISDN, Teleguide, automatic voice-response, public access to international directories, Telecom CD-ROM, among others) and on improving public directories.

Pierre Visconti. After the apprenticeship as a precision mechanic, he worked as an aircraft mechanic for Swissair. He stayed there for several years before he took up work for Radio Schweiz AG as an air-traffic controller. When Radio Schweiz AG started their first big data processing project, he decided to take up a career in data processing. Since 1975, he has been working for directory assistance and for the editorial offices of the telephone directories in the data processing department of the general directorate PTT. He is the head of the project responsible for data processing of the project 'electronic subscriber directories ETV' and other projects linked to it.

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