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ATM NETWORK INFRASTRUCTURE

THE ACCESS NETWORK

The Swiss Telecom PTT offers under the product group name SwissWAN, among others, services via their ATM network. The access to the ATM core network covering Switzerland is established via so-called service multiplexers (SM) and the Digital Service Unit (DSU) of the ATM network. The main requirement for the network element SM is an equipment structure flexibly adaptable to varying user needs.

Telecom PTT has chosen the Siemens Albis Ltd company in Zurich to deliver equipment for the ATM terminals of the connection area, one of the reasons being the realizable, operationally uniform concept for the leased-line network MilaNet and the ATM network of SwissWAN.

ATM access switch SM 36150

Within the ATM access network of SwissWAN, the product SIMUX 36150 ATMnet access switch of the product manufacturer Newbridge Networks Corporation, Canada, is used. The SIMUX equipment is, owing to its modular concept and the many available services and interfaces, well suited as an access terminal within SwissWAN. The SM 36150 combines the adaptation function, i.e. the adaptation of non-ATM-conform data streams to the ATM cell format, with an integrated ATM switching matrix and the required ATM line interfaces in a compact 19"-rack (Fig. 1). Depending on the requirements, network elements with 4, 6, 8 or 16 usable slots are available. The SM 36150

and also the ATM switching units can be redundantly equipped as needed, leading to a very high availability of the services offered.

The SM 36150 comes in two versions: either in a cabinet version to be placed on the customer's premises with a 240-V power supply or in a rack version for the implementation into racks at the network operator's site with a power supply of 240 V AC or 48 V DC. Figure 2 shows the SM 36150 in a redundant 8-port-rack version.

Switching Matrix

Owing to the switching matrix, the SM 36150 allows for the concentration of ATM cells; the local switching of paths between connected users is also possible. The switching matrix consists of a matrix of switching modules each capable of switching the ATM cells of 4 ports with 155 MBit/s

contains a switching matrix of corresponding size with the same number of STM-1 equivalents.

The central plug-in units such as the controller and the power supply unit

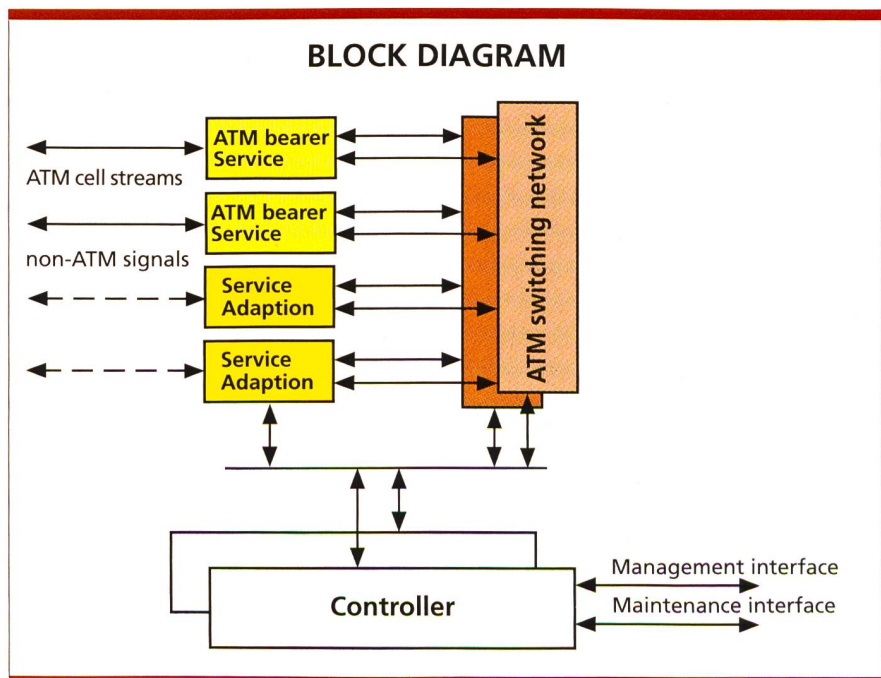


Fig. 1. Block diagram of a service multiplexer.

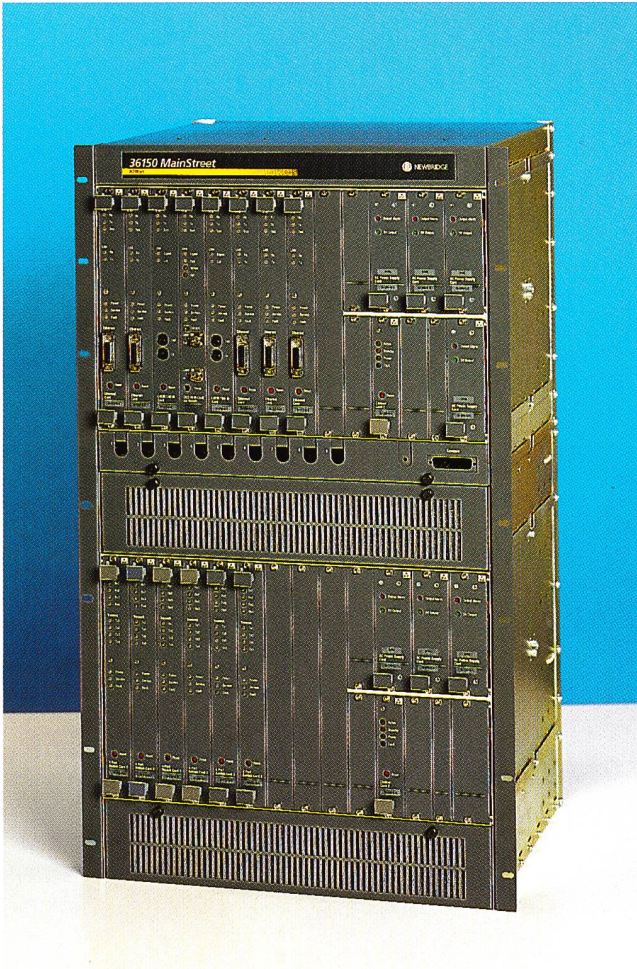


Fig. 2. Service multiplexer 36150 in the redundant 8-portrack Version

without blocking. It is capable of multicasting, and it works self-routing. The switching path for every ATM cell is predetermined by the routing table. Switching is done on the hardware level with the determined high speed.

The switching matrix supports two QoS (Quality of Service). Paths with critical delay requirements, such as used for speech or video applications, are switched with a higher priority than uncritical paths, being used e.g.

for data transmission. In the case of temporary collision, which can occur due to the bursty nature of data transmission, the cells of time-critical connections are handled with priority.

ATM Digital Service Unit (DSU)

In the first phase, the SMDS (Switched Multi-megabit Data Service) service is established over a DSU from Digital Link Corporation. This is only a temporary solution until the SMDS service of SM (service multiplexer) is supported from Newbridge.

The DSU enables SMDS via a V.35 interface or an HSSI (High-Speed-Serial Interface) with the DXI (Data exchange Interface) protocol. The access to the ATM network is realized by means of a E3/ATM interface. A router is usually connected to the DTE (Data Terminal Equipment) interface. The router hands its data (datagrams of up to 9232 octets) over to the DSU. These datagrams contain the complete target address in E.164 format. In the DSU, the datagrams are segmented according to AAL 3/4. The cells generated in this way are transmitted to the ATM network via the virtual connection associated with the E.164 address. The typical application case is in connection with a CLS (connectionless server), over which a connectionless data service such as SMDS or CBDS (Connectionless Broadband Data Service) can be established.