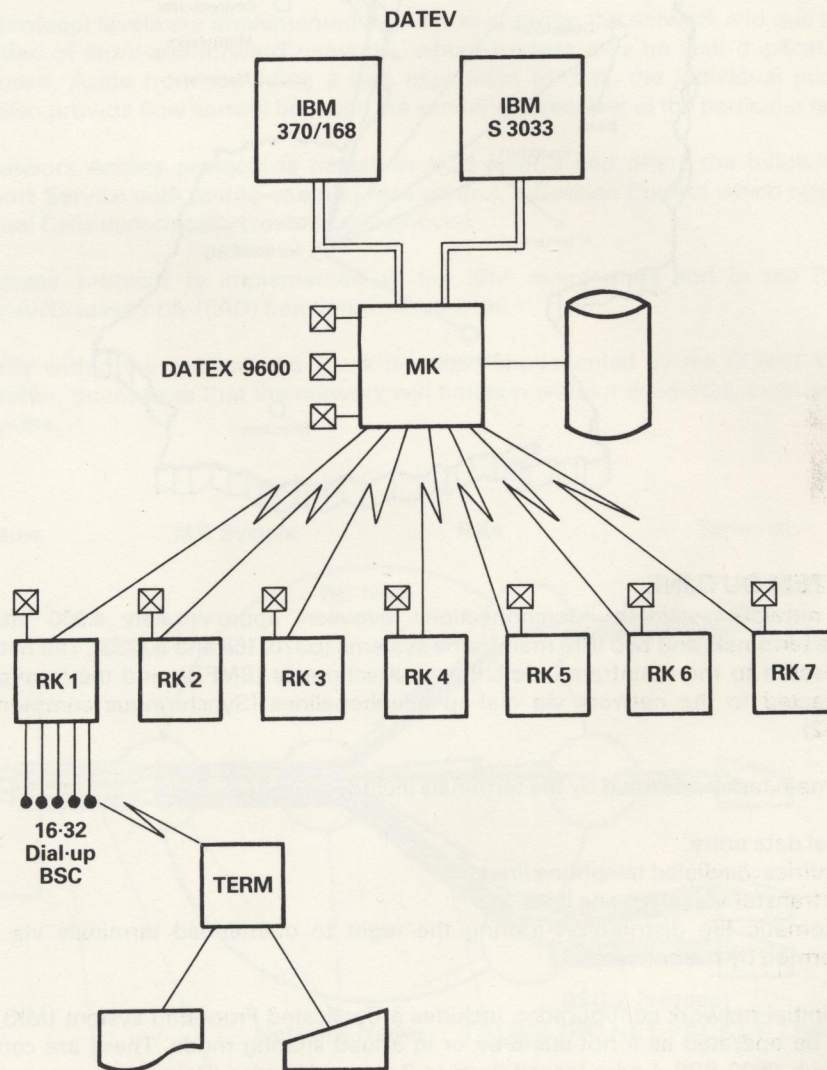




Application Report Datev Data Network



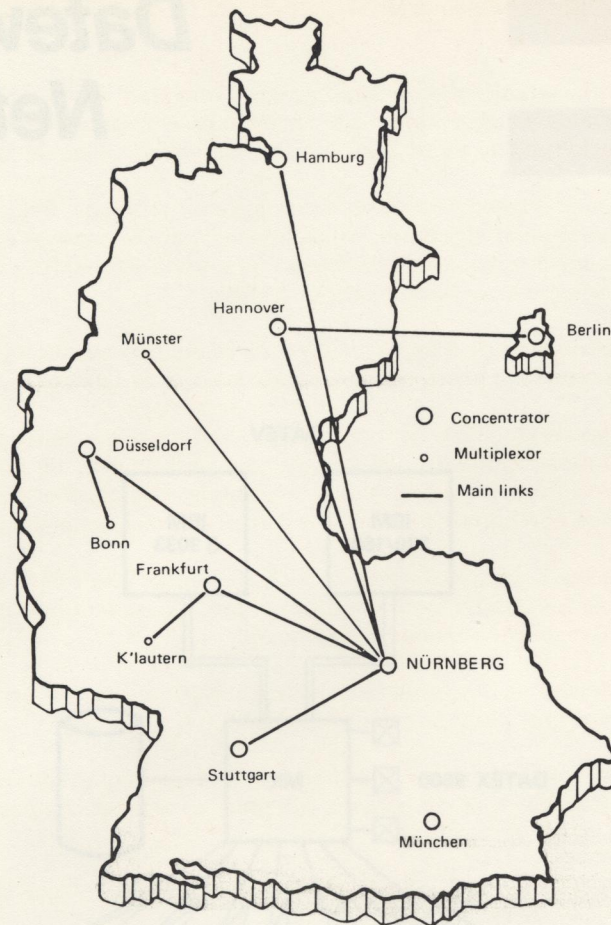
GENERAL

In 1980 RC finalized the installation of a private network to be put into operation for the service of approximately 4.000 intelligent office terminals and the computing center – DATEV – of the German tax auditors.

The main centre is located in Nürnberg, and at seven geographical locations throughout Germany network nodes and terminal concentrators are installed.

Besides the local operations, such as data registration and off line printing, the primary task of the tax-auditor terminal is to enable file transfers to/from the computing center and also to offer an enquiry service basically for information retrieval purposes.

The Datev Data Network (DDN) functions as the interconnection media between these terminals and the IBM main-frames.



SYSTEM OUTLINE

The network establish interconnections between approximately 4.000 intelligent office terminals and two IBM mainframe systems (S370/168 and S3033). The network is connected to the mainframe via channel attachments (BMPX), and the terminals are connected to the network via dial-up telephonelines (Synchronous communication BSC-2).

The main task performed by the terminals include:

- local data entry.
- inquiries via dialed telephone lines.
- file transfer via telephone lines.
- automatic file distribution (during the night to unattended terminals via dial-up performed by the network).

The initial network configuration includes a duplicated Front-End system (MK), which may be operated as a hot stand-by or in a load sharing mode. These are connected through 9600 BPS 4 wire leased lines to 7 network nodes (Remote Concentrator, RK) located in seven strategic cities.

Each RK is equipped with 16 or 32 synchronous BSC channels, and a number of dial-up units. The link control protocol between MK and RK is HDLC (CCITT X.25 level 2 LAP B). As back-up for the leased lines, and for load-sharing purposes during peak load periods alternative links are created by utilizing the DATEX 9600 service of the DBP public switched data network.

The network is based upon RCNET, a packet switched store-and-forward network. The requirements of maintaining many simultaneous file-transport throughout the network involves the use of a number of network protocols carrying out the flow and congestion control.

IMPLEMENTATION STRATEGY

The initial network topology is simple and is structured as a star-network. Apart from the 8 permanent 4 wire leased line links, 3 back-up DATEX links may be connected to any one of the RK's. The allocation is determined by the Network Operating Center located in the MK.

The MK-system is actually a duplicated system, operated in hot stand-by or in load sharing mode with any number of RK connected to each system. The physical switching is in this case performed by a V.24 T-bar switch creating two "independent" networks.

The RCNET routing strategy supports a complicated topology. The routing is based upon an adaptive routing algorithm, which implies that the network automatically will compensate for any interconnection between RK's, or additional RK's connected either directly to the MK system, or through any other RK's.

The CCITT recommendation X.25 has been used as the user access level which implies that DDN is prepared for a future extension with public X.25 services.

Other protocol levels are implemented in order to optimize the network and due to the properties of store-and-forward networks, where packets may be lost, duplicated or transposed. Aside from providing a safe expedition of data, the individual protocol levels also provide flow control between the sender and receiver at the particular level.

The Network Access protocol is based on X.25 level 3 and offers the following: a Transport Service with end-to-end and flow control, a Session Control which operates on Virtual Calls dynamically created and removed.

The access protocol is implemented in the IBM mainframes and in the Packet Assembly/Disassembly (PAD) function within the RK.

Internally within the network the Trunk protocol, implemented by the RCNET Packet Transporter, guarantees that the network will function without deadlocks, even at high traffic rates.

