The remote access at DESY.

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The DESY LAN is a multiprotocol network , many network applications which are used for control and monitoring at DESY are based on IP, IPX and Appletalk protocols and need to be used remotely. This report introduces a technical realization of the central remote access system at DESY, solutions of the remote clients for many operating environments and management tools to provide access to that facility.

Key words: Remote; ISDN; Modem; PPP.

1 Introduction

Just a few years ago remote access could be provided only by analog modems at speeds up to 9.6Kb/s and with restricted network services. The other telecommunication media such as ISDN were too expensive as well as there were no technical solutions (adapters, routers, software) to provide remote services for IP, IPX, Appletalk networks in one box. Now there is a variety of hardware and software to establish reasonable connectivity at data rates up to 33.6Kb/s by analog modems, up to 128Kb/s by ISDN. Latest technologies such as ADSL, cable modems, direct-broadcast satellite to provide faster access at data rates of 400Kb/s - 10 Mb/s for individuals and small offices are coming soon. Though the situation is different now, it's still a problem to find suitable and cheap solutions to provide remote access in multiprotol network environments which can satisfy the rapidly changing user requirements, build scalable and easily supportable systems. In early 95 we decided to build and develop the remote access system at DESY based on products from Ascend Communication Inc., the leading company in the telecommunication business.

2 Design of the remote access system at DESY.

The central remote access system at DESY is based on a single unit multiprotocol router/bridge MAX 4000. This router is connected to the LAN by ethernet and to the external world by primary ISDN lines. Up to 4 PRI lines are available with 30B+D channels each. The second part of the remote access system are the radius (Remote Access Dial-in Users Service) servers, which are running on Unix hosts connected to the LAN. These servers keep identical information about authorized users, their individual parameters for remote access, such as protocols (IP,IPX,PPP, SLIP, character, AT), userid, password for CHAP/PAP authentication, IP addresses, IPX addresses (if necessary) and so on. The radius servers are also gathering accounting and traffic information. The general structure of the remote access system at DESY is shown in figure.1 .

DESY's central remote access system's capabilities include today:

- serve up to 30 64KB/s calls over ISDN per PRI line;
- serve up to 16 V.34(+) analog calls at data rates up to 33.6Kb/s; (with optional modem modules it's possible to serve up to 48 analog calls simultaneously);
- SNMP control and management;

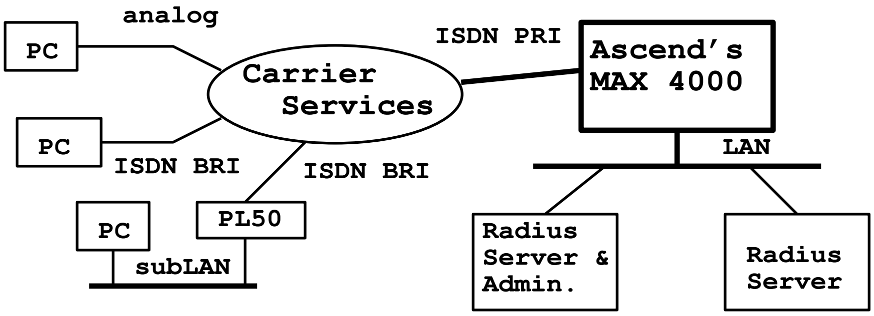

Fig. 1. The structure of remote access system at DESY

Table 1
Features of PPP clients:

Name	modem	ISDN	MPP	PPP	On-Demand	Callback	Dial-In
MS DOS/Win3.11	Yes	Yes	No	Yes	Yes	Yes	Yes
Windows 95	Yes	Yes	No	Yes	Yes	No	Yes
Windows NT	Yes	Yes	No	Yes	Yes	No	Yes
Linux 1.3.x	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MAC System 7.x	Yes	Yes	No	Yes	No	Yes	Yes

- support MPP, MP+, PPP, SLIP, ARA 2.0 encapsulations;
- support Point-to-Point Tunneling Protocol (PPTP);
- CLID (Connection line identification) authentication;
- PAP/CHAP and login authentication;
- character oriented dial-in modem calls;
- TCP/IP, IPX and AppleTalk routing;
- dial-out PPP calls over ISDN and analog lines;
- callback for PPP entries over ISDN and analog lines

For the management of this system, administrators use tools with different interfaces (HTML, SMTP, GUI for X11) implemented by DESY.

3 The solutions for remote clients.

To use Internet applications such as FTP, TELNET, Netscape, Mail it's necessary to establish an IP or/and IPX network connection via serial modem or ISDN link. For this purpose, the Point-To-Point (PPP) software should be installed and configured on a remote computer, which is typically a PC. Under investigation at DESY was a good variety of PPP software such as ISPA/ISDI/CINDI PPP drivers, Klos PPP, MAXPRO PPP, TELES-RAS/NT, TELES-Miniport PPP software, Windows 95 RAS, PPPD 2.2.0F for Linux 1.3.x OS. The table 1 summarizes their features.

4 The improvement of global connectivity for world wide groups of reseachers.

There are many small groups of researchers around the world participating in the scientific programms at DESY. The Internet as the main network infrastructure for communication of such groups cannot provide good connectivity with many sites now. It's also clear, that the upgrade of the Internet links is very expensive and a slow procedure which can only be done by ISPs. To improve the communication of such groups with DESY, we suggest to extend the DESY LAN over ISDN, make an isolated ethernet segment in the institution's network a subnet of DESY's LAN and connect it to the own institution's LAN by means of a computer with two network interfaces. Such a solution is shown in figure 2. To

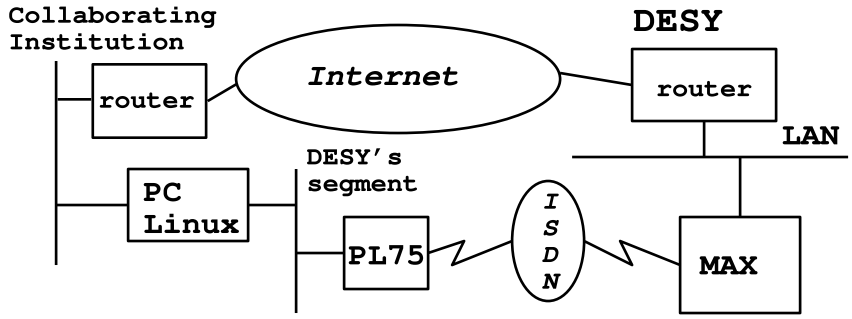

Fig. 2. IP connectivity for DESY with the Physics Department at University of Toronto

work with DESY's central computing facility, a remote group should install a PC under Linux OS with two network adapters (2 ethernet or ethernet and ISDN). Forwarding of IP packets should be disabled between both the interfaces. By using this PC, a researcher can get reasonable connectivity for data transfer from/to DESY over ISDN and still has access to the own LAN and Internet. The Physics Department at the University of Toronto (Canada) is using this scheme with Ascend's Pipeline 75 as ISDN access router in order to communicate with DESY.

5 Acknowledgments.

We would like to thank Dr. Dave Walsh from technical support group of Ascend/US for his help with the installation of the system and quick responses in case of any technical problems. Also we would like to thank Dr. Wade Hong from the University of Toronto (Canada) for his installations and tests in order to communicate with DESY over ISDN.

6 References.

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