Related Projects

Two projects are under way that have a bearing on the development of networks to carry multimedia traffic.

Teleservices Project

The Teleservices project is part of the Deutsches Bundespost (DB) Telekom BER-KOM technology and demonstrator program. The program covers wide area network and campus broadband communication studies, using broadband switches and local optical-fiber links installed in Berlin to form a large test bed. It now forms part of the German Broadband Integrated Services Digital Network (B-ISDN) asynchronous transfer mode (ATM) pilot network, with switching centers in Cologne and Hamburg.

The Teleservices Project is investigating the provision of multimedia services over wide area, broadband networks. HP is involved in two areas: multimedia collaboration (MMC), supporting conferencing and shared applications, and multimedia transport (MMT), developing high-speed networking protocols for multicast operation.

HP joined in April 1993, with collaboration from HP Germany, HP Laboratories in Bristol, and TUB (Technical University of Berlin, as an HP subcontractor). The main HP/TUB task is the development of high-speed network protocols and the overall implementation and integration of the complete collaboration application under the multimedia collaboration task for the demonstration of interoperability. Five HP 9000 Model 755 computers have been installed at the TUB for the multimedia implementation, together with a range of audiovisual equipment, communications interfaces, and associated software packages. Prototype HP ATM switches have also been installed.

The program will produce a limited HP multimedia communications and management product for use on HP 9000 Model 7x5 workstations in the German broadband trials. It will also provide measurement and performance evaluation results, including:

- Observations of the interactions between video and audio compression schemes, transport protocols, the different network technologies used, and their impact on perceived performance
- Identification of particular issues and problems associated with multimedia applications related to HP products and commercial interests
- Performance measurement and behavior of a transport protocol designed for multimedia applications running over different network technologies.

A demonstration was given in August 1993 using the first version of the conference application with software video compression and relatively simple control options. In March 1994, an enhanced version was demonstrated at the CeBIT exhibition in Hannover. This had a range of management and control options, an audio server, and full-motion hardware compression (M-JPEG). It also included multivendor terminal interworking at the show over the ATM demonstration network and conferencing over ATM link connections back to a terminal in Berlin.

A demonstration of the Teleservices package between HP Laboratories in Bristol and the TUB, using ISDN at about 300 kbits/s showed that a minimum transfer rate of 1 Mbit/s is required for successful operation. Wideband operation over ISDN connections is also being evaluated.

Distance Learning Seminar

In October 1994, a pan-European seminar on distance learning was held on a network linking three European universities (the Royal Institute of Technology, Stockholm, the Technical University of Berlin, and University College London) and various other European sites. The seminar was sponsored by HP and aimed to promote the use of distance learning and to explore the future of the technology and the role of multimedia.

The seminar was a practical demonstration of multimedia over a mix of transmission technologies. German Telekom provided B-ISDN (broadband ISDN ATM) links between Berlin and London and Berlin and Stockholm. Other links used inverse multiplexers at each site to provide contiguous bandwidth over ISDN of 384 kbits/s. This provided adequate bandwidth for 25-frames-per-second video using hardware compression based on the H.261 standard, plus good-quality audio.