ISIS -Interactive satellite multimedia information systems

The ISIS project in the European Union’s ACTS programme showed how a satellite platform could be used to provide a wide range of interactive multimedia applications. This evaluation was based on the performance of the system when applied to the fields of tele-education, tele-medicine, tele-working, news on demand and the internet.

The ISIS demonstrator platform was a Ku/Ka band satellite system composed of a single service centre with forward Ku band link capabilities and Ka band return channel for handling the users’ interactive phases with the direct-to-home (DTH) terminal. The same system platform was used to support all of the applications, as outlined below.

Applications used for experiments

Tele-working

By using networked digital technologies, collaborators in different geographical locations could see, hear and exchange images and documents on a daily basis, as well as working collaboratively on applications.

The trial mainly consisted of a simulation of multimedia production (a cartoon) by teaming up two different specialised teams located in different geographical locations, using the ISIS communication link.

The two teams involved in the cartoon realisation were specialised in some aspect of the production. One was the cartoon director, and was responsible of all the decisions on the cartoon. The second was specialised on some aspect of the cartoon production (painting, editing, special effects), and had to perform all the major work on the cartoon. To allow the teams to co-operate on the same video clips, an application software (TELEFLIP) was developed in the project. This software was mainly a remotely...
controlled VCR with annotation tools which was shared by both teams to view and comment on the same video clip during a video-conferencing session.

**News on demand**

This provided acquisition of information interactively on news items, summaries and headlines. A news filtering system also automatically selected information based on a user's pre-recorded profile.

The News on Demand (NoD) application focused on the development of a multimedia database with news stories combined with a web server application responsible for delivering the information to clients. The clients were standard web browser applications running on PCs. They connected to the web server using the ISIS satellite network and they retrieved the stored material in various ways.

**Tele-medicine**

The ISIS tele-medicine application (MEDI) was organised as an access to a medical database and as a tele-consult demonstration. MEDI was a WEB application. The MEDI application could run on different platforms providing major independence to users because it is based on JAVA. However the MEDI application was optimised to use on Personal Computer with Windows 95/Windows NT 4.0. A client could see and start the MEDI application using a commercial browser such as Netscape, Explorer or HotJava.

Together with the MEDI application, an audio tool (Microsoft NetMeeting) ran on the clients to allow exchange of comments and information on the medical images. The MEDI application required a connection that could guarantee up to 384 kb/s in order to quickly transmit the high size medical images involved in the application. This proved to be a limitation, since the return link provided in the ISIS trial campaign at 64 kb/s provided an image transfer time which was too long.

**Internet**

This application supported standard Internet navigation with any available commercial browser - exploiting the benefits provided by the satellite forward link capability in terms of higher bit-rates.

**Distance Learning**

Tests were about the Quality of Service of the tele-education application and the tasks to be done to obtain given levels of QoS. In order to evaluate the technology, the trial used various models of tele-education courses and in very different disciplines (Archaeology, Medicine, Music, Literature, Philosophy, Psychiatry).

The project was evaluating the technology, as opposed to the products, so attention was focused more on the specific technology factors (e.g. quality vs. time of response) than on the quality of the content.

The tests carried out were:

- Integration tests on the tele-education server, its connection to the LAN, the client configuration, the client LAN connection, and the client/server connection.

- Application tests about the QoS (Quality of Service) of the tele-education application and the tasks to be done to obtain given levels of QoS. For the pilot project they developed six model applications, each one aimed at exploring the potential advantages of this system. The teaching units were of three types: self contained seminars, examples of lessons from within a larger course structure and lessons that could be used to supplement other types of course material.

The functions available included the following:

- Insertion of live material (video) in the hypertexts. These went from traditional lectures in the classroom to theatre performances, from video-conferences with remote classrooms to in field lectures
- Question and answers clickable during the lecture
- Insertion and transformation of stand-alone hypertexts.