Integration of multimedia collaboratory environment with Web browser

Janusz Bu³awa, September 1996
The Franco-Polish School of New Information and Communication Technologies

Contents of presentation

- Introduction
- Available teleconferencing systems- are they OK?
- What are “enabling technologies” for Web?
- We can build a completely new system !
- Some intermediate steps were necessary...
- What in fact we implemented? - features
- What in fact we implemented? - architecture
- What is not yet done but should be...
- Conclusions

Introduction

- Needs for new multimedia communication means are still growing
- Collaboration becomes more and more important for companies, committees, working groups etc.
- New technologies enable multimedia teleconferencing (Web, protocols, compression)
- Network resources are limited
- Flexible solution is required (QoS, efficiency)

Available teleconferencing systems - are they OK?

- Commercial systems:
  - large bandwidth required (in Mbps)
  - expensive hardware needed (cameras, hardware codecs and so on)
  - proprietary solutions deployed (compression)
- Systems for Internet:
  - less bandwidth required, accessible to everyone
  - data losses cause rather poor quality of service
  - not very reliable

What are “enabling technologies” for Web?

- new protocols (RTP, RSVP, multicast)
- Java and JavaScript
- OpenDVE™ collaborative environment
- new video compression schemes (H.261, H.263, wavelets)
- Netscape Plug-In API
- LiveConnect and LiveMedia framework

We can build a completely new system !

We propose the following solution:

- to build collaboratory system with use of the OpenDVE technology
- to integrate our collaboratory system with Web browser (such as Netscape Navigator 3.0)
- to make our new system be modular (separate, independent teleconferencing tools)
- to deploy advanced data compression schemes for videoconferencing

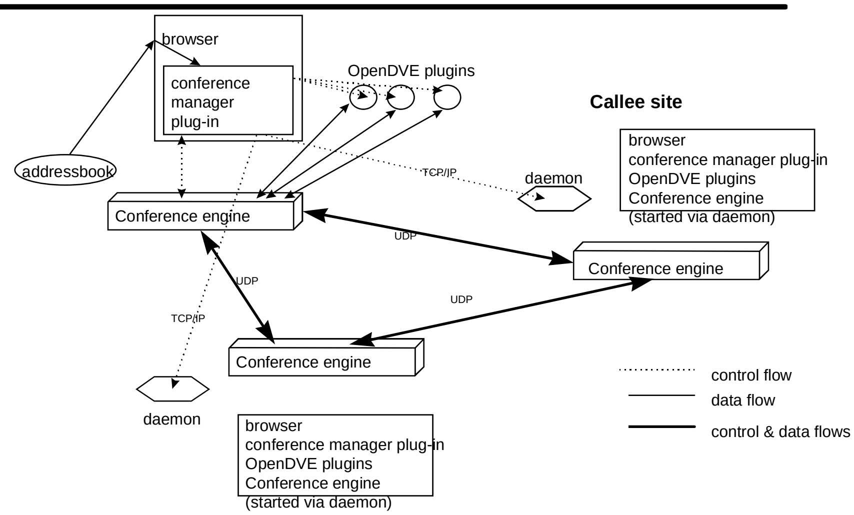
Some intermediate steps were necessary...

- To be able to integrate our collaboratory system with Web browser we first implemented H.263 video player plug-in for Netscape ...
- To provide session management we experimented a lot with OpenDVE technology: first simple plugins, InSoft's software analysis ...
- To distribute video data with reasonable bandwidth consumption H.263 software codec has been optimized and extended with some new features: periodical I frames, multiple streams ...

What in fact we implemented? - features

- conference management from within Web browser's window (plug-in application based on OpenDVE technology)
- automatic multi-participant teleconference start
- separate tools for different types of data: audio and video multipoint (OpenDVE plugins)
- very low bit rate (64 kbps of one ISDN B-channel can be sufficient for both audio and video)
- compatibility with T.120 and H.320

What in fact we implemented? - architecture



What is not yet done but should be...

- more sophisticated remote software control mechanism (to be provided by third party)
- more teleconferencing tools (OpenDVE plugins)
- resources reservation capability (RSVP)
- teleconference log in a database (JDBC …)
- *LiveConnect* with Java applets (already tested with video player plug-in)
- *notebook* feature in the *conference manager* and many more...

Conclusions

Our Web-integrated collaboratory system provides:

- convenient teleconference management
- modular, extensible architecture
- low bit rates and superior quality of service for multimedia teleconferencing
- state-of-the art technologies
- compliance to current teleconferencing standards

However, many extensions should be done to make this system be more attractive as a product...