Abstract

The purpose of this thesis is to describe the design and implementation of a multiplatform, desktop videoconferencing system for the Internet. First, the technologies and standards utilized currently for the multimedia, real-time, collaborative applications are briefly described. Then, existing videoconferencing products are presented and analyzed, identifying disadvantages and possible modifications. Based on the analysis, the objectives of the improved videoconferencing system offering new functionality are formulated. At that point, the design that is most suitable for the assumed objectives is proposed, addressing the particularly important issues of platform independence and flexibility. The implementation of this design on two most popular multimedia platforms is described in detail, dealing with the encountered problems and platform specific solutions. This part includes the presentation of the system components and their interactions, focusing on standard compliance and interoperability. To prove the system flexibility in adapting to modern environments, the integration with a Web collaborative application is discussed. Summary of the system characteristics and the achieved goals concludes the thesis.

Multiplatform, Desktop Videoconferencing System for the Internet

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THESIS

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List of Abbreviations and Terminology

ADPCM	Adaptive Differential Pulse Code Modulation
API	Application Programmers' Interface
CM	Conference Manager
CE	Conference Engine
CIF	Common Intermediate Format
CPU	Central Processing Unit
CSRC	Contributing Source
DCT	Discrete Cosine Transform
ETSI	European Telecommunication Standards Institute
FFT	Fast Fourier Transform
GCC	Generic Conference Control
GOB	Group of Blocks
GSM	Global System for Mobile Communication
GUI	Graphical User Interface
H.263	One of the latest video-coding standards, emerged from h.261
IP	Internet Protocol
ITU	International Telecommunication Union
kbps	Kilobits per second
LAN	Local Area Network
LPC	Long-Predictive Coding
LTP-RPE	Long Term Predictor - Residual Pulse Excitation
Mbps	Megabits per second
MC	Multipoint Controller
MCL	Multipoint Control Layer
MCS	Multipoint Communication Service
MCU	Multipoint Control Unit
MP	Multipoint Processor
MPEG	Moving Pictures Expert Group
QCIF	Quarter CIF
QOS	Quality of Service
PC	Personal Computer

PCM	Pulse Code Modulation
RFC	Request For Comments
RLE	Run-Length Encode
RR	Receiver Report
RSVP	Resource Reservation Protocol
RTCP	RTP Control Protocol
RTP	Real-time Transport Protocol
SCL	Session Control Layer
SD	Session Directory
SNR	Signal to Noise Ratio
SR	Sender Report
SSRC	Sending Source
TCP	Transmission Control Protocol
TTL	Time To Live
UDP	User Datagram Protocol
URL	Unique Remote Locator
VAT	Visual Audio Tool
VIC	Videoconferencing Tool
VLC	Variable Length Coding
WWW	World Wide Web