



A Scalable Open Source Framework for Live Media Production and Distribution

Dipl.-Inf. Albrecht Kurze, Dipl.-Inf. Robert Knauf

Based upon the open source multimedia framework Videolan Client (VLC) we developed a scalable solution for video live production. It allows recording, composing images, encoding and distributing to digital TV, web or smartphones. With the help of few simple and low budget components as a laptop, (H)DV camera and VGA grabber both video and audio as well as the current picture of a beamer can be captured and arranged at high quality. Graphical elements as logo, lower thirds and program infocards can be superimposed and managed. All components are connected via IP and can be distributed across several PCs and servers in accordance with the requirements. A playout system capable of both broadcast and broadband transmission can be established either on the on-site laptop or on more powerful remote servers.

Proving the system in practice

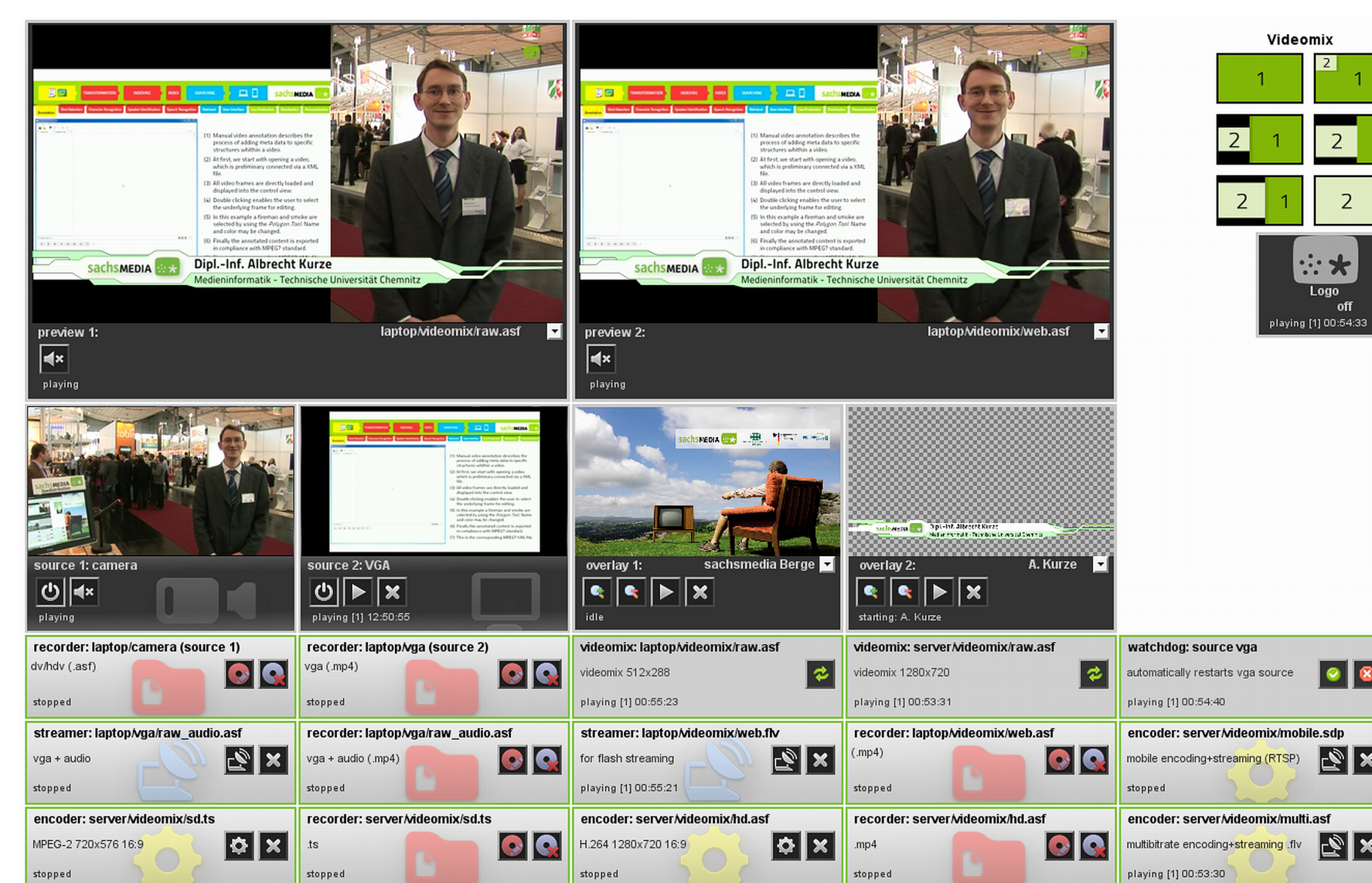
With our system we successfully realized the transmission of several lectures and large-scale events such as the *Chemnitzer Linux-Tage* 2010 and 2011.

The talks of up to 5 parallel tracks were captured, mixed and transmitted live via DVB-T and Internet streaming.

For that purpose, we used a distributed setup realizing source aggregation and video mixing using laptops on-site on the one hand and transcoding to the target formats using powerful remote servers on the other hand.

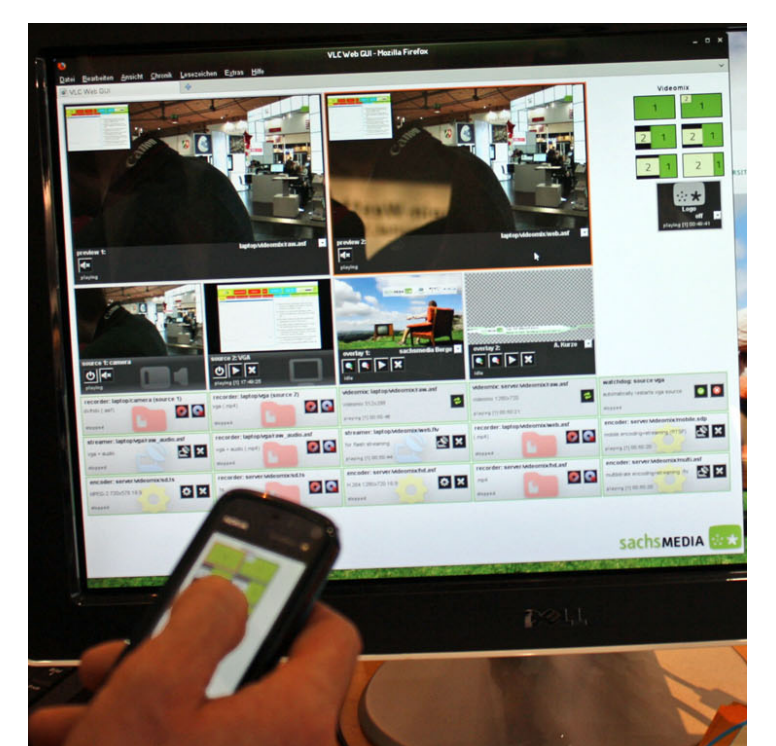


Source aggregation and video mixing during a showcase at Chemnitzer Linux-Tage 2011.

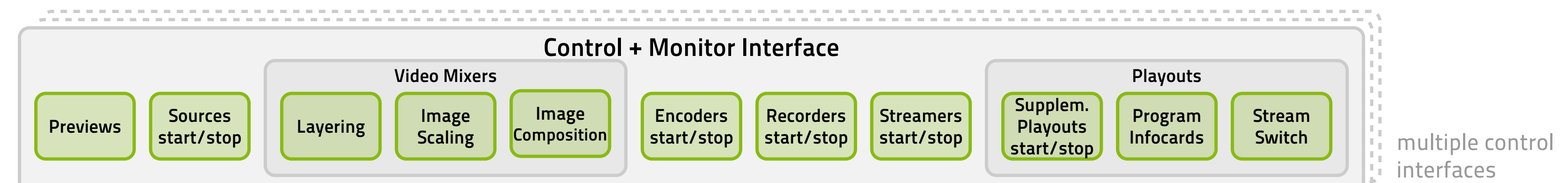


Control + Monitor interface with the web browser

- configurable previews: sources – video mix – resulting streams
- preset buttons for a quick toggle of shot compositions
- surveillance and control: encoders – recorders – outgoing streams
- scalability: one front-end controls several back-ends
- location-independence to control operations from almost anywhere
- GUI elements are quickly configurable
- quick GUI adaption for different purposes, e.g. local video mixing with limited stream administration or centralized playout control without video mixing



Web front-end and mobile front-end for video mixing control.



The Framework

VLC as base framework offers a flexible A/V processing chain for:

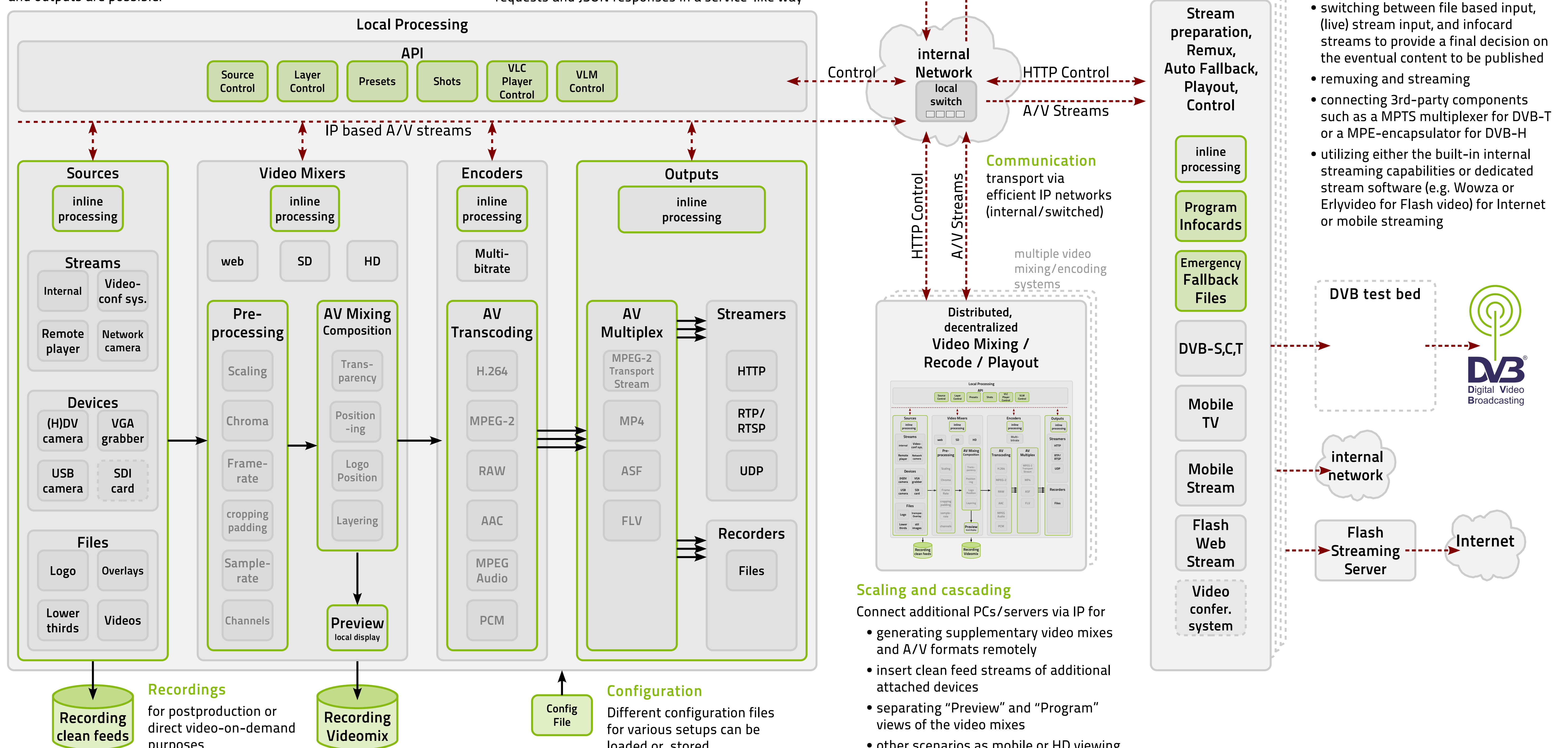
- Source aggregation
- Encoding
- AV processing
- Multiplexing
- Composition
- Output provision

Those consecutive components can be connected via IP. An API enables their independent control.

The resulting IP streams might carry compressed or even raw A/V content. In summary, multiple parallel sources, encoders, and outputs are possible.

Access to objects and functions: The API

- built-in HTTP interface enables network control
- internal Lua scripting engine provides a server pages approach for the easy adding of functionality
- resources can be managed and monitored via HTTP requests and JSON responses in a service-like way



Contact:

Dipl.-Inf. Albrecht Kurze · albrecht.kurze@cs.tu-chemnitz.de
 Dipl.-Inf. Robert Knauf · robert.knauf@cs.tu-chemnitz.de
 Chemnitz University of Technology · Chair Media Informatics
 Strasse der Nationen 62 · 09111 Chemnitz · Germany