AV Technologies and Collaborative tools at Masaryk University

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Presentation overview

Introduction

Videoconferencing Infrastructure

Support for lecture and event recordings

Research and development activities

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Introduction

◼ AV use cases at university

- **Regular lectures and seminars at university buildings**
- **On-line meetings and conferencing**
- **Ad-hoc events (e.g., guest presentations) at university buildings**
- **Ad-hoc events (e.g., conferences) outside the university**
- **Recording and streaming support for these events**
- **Research in (advanced) collaborative technologies and multimedia transmissions over high-speed networks**

AV infrastructure at MU

- Seminar rooms
  - projector (+ optional audio)
  - no AVT
- Lecture halls
  - multiple projectors and audio, multiple inputs (NTB, PC, camera, VCF)
- Conference and meeting rooms
  - projector or LCD, audio, VCF or webcam (small rooms)
- Videoconferencing server infrastructure
  - included in national infrastructure for R&D
  - multiple technologies for different needs

Institute of Computer Science MU roles

- Strategy of AV technologies at MU
    - definition of AV standards
    - participation on design and installation of AV technologies
    - coordination of services and activities (2nd level support)
- Videoconferencing infrastructure management
    - one of the key AV services
    - H.323/SIP infrastructure
    - SW platforms for collaboration
- User support and consulting
- Research in advanced collaborative environments

Strategy of AV technologies at MU

- **Common definition of standards for audio and video distributions**
- **Cooperation during design phase**
    - **CARLA (Faculty of Arts)**
- **Supervision of installation phase**
    - **University campus**
- **Complete analysis and design of AV related tenders**
    - **CESEB, CEITEC (University campus)**
- **2nd level user support (AV specialists) for complex issues**

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H.323/SIP Videoconferencing

- Up to 1080p audio and video transmissions
- Terminals(HW clients)
    - endpoints of H.323 infrastructure
    - user interface
    - enable point-to-point connection
- SW clients
    - SW terminals for PC and mobile platforms (iOS, Android OS, Windows Phone)
- MCU (Multipoint Control Units)
    - provide multi-point tele/videoconferencing (3+)
    - virtual meeting rooms
    - terminals communicate through MCU

H.323 infrastructure at Masaryk University

Terminals

- **SW clients for individual users (LifeSize ClearSea)**
- **VCF terminals integrated in meeting rooms and lecture halls (e.g., FI, ICS, UCB)**
- **Mobile VCF units (CESEB, CARLA, CEITEC, CERIT)**
   - **single-display solution (CESEB, CARLA)**
    - **dual-displays (CEITEC)**

Infrastructure

- **Multi-Point Control Unit for group collaboration**
- **Content-Server for video streaming and lecture recordings**

■ H.323 infrastructure at Masaryk University

Microsoft Lync

- Alternative to Skype
- Integration with MS Office suite
- Integration with university account in ISMU
- Key features:
  - chat, Audio/video conferencing
  - multipoint groupware
  - desktop/document sharing
- Available in MS Windows OS X and mobile platforms
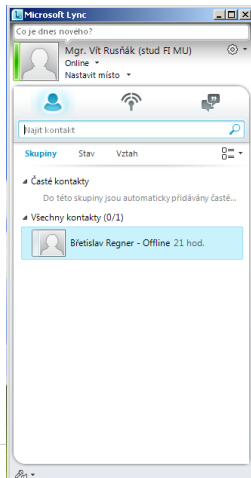
Adobe Connect

- Flash-based system for team collaboration and e-learning activities
- Server is managed by CESNET
- Key features:
    - chat, tele and videoconferencing
    - desktop, document and application sharing
    - virtual whiteboard
    - session recordings
    - user roles
    - questionares and short surveys
- Requires Adobe Flash Plugin
- iOS and Android clients

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Support for lecture and event recordings

- **Regular lectures**
  - **distributed encoding environment**
  - **two use cases – FI and UCB**
  - **Linux-based vs. H.323/SIP**
- **Ad-hoc events**
  - **off-line recording AV teams at faculties (FSS, FF, FI)**
  - **recording and streaming – provided by ICS with H.323/SIP or UltraGrid**

Regular lectures

- **Distributed encoding environment**
- **Used mainly for regular lectures**
    - **since 2001 at Faculty of Informatics**
    - **from student activity to production service**
    - **last couple of years also from the University Campus (using videoconferencing infrastructure)**
    - **infrastructure for video encoding.**
    - **available via university IS and** `http://www.video.muni.cz` **(with secured access and user roles)**

Ad-Hoc events

- **Off-line recordings**
    - **manual post-processing**
    - **small autonomous teams**
    - *e.g., Theater Play at FI, habilitation talks, Sicence week events*
- **On-line recording with streaming**
    - **using H.323/SIP infrastructure**
    - **automated processing with minor post-processing by user (video segmentation)**
    - **E.g., Conference on Acute Medicine,**
- **Published at** `http://www.video.muni.cz` **or other portals (free access)**

Events with special demands

- When H.323/SIP solution is not enough…
- UltraGrid – software for low latency and high-quality video network transmissions
    - FullHD, 4K, 8K (both compressed and uncompressed)
    - support for H.264, JPEG, JPEG2000, DXT
- Use cases:
    - regular cooperation with cardiology department
    - ad-hoc transmissions (e.g., gynecology)
    - pilot adaptation for teaching (general surgery, cardiology)
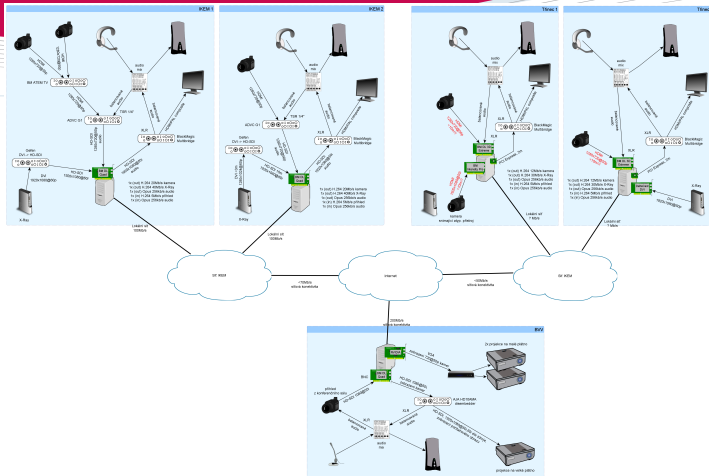
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Topics

- **High-quality multimedia transmissions**
- **Self-organizing collaborative environments**
- **Advanced group collaborative platforms**

High-quality multimedia transmissions

UltraGrid

- Up to 8K ($16\times$ HD resolution)
- Focus on low-latency and high quality multimedia transmission
- Research in parallel encoding and decoding of video formats
    - JPEG, JPEG2000, DXT
- Joint project of CESNET and MU (Laboratory of Advanced Network Technologies)
- `http://ultragrid.cz`

Self-organizing collaborative environments

CoUniverse

- – Framework for self-organizing collaborative environments
- – Research in scheduling strategies for multiple data stream transmissions
- – Use case: Infrastructure for remote sign-language translation in seminars and lectures

■ Advanced group collaborative platforms

- Visualization cluster-based display walls and large tabletops
- Use of SAGE and DisplayCluster middleware
    - MUSE Framework
- Research in multi-user interaction methods and visualization

Research and development partners

- Laboratory of Advanced Network Technologies (SITOLA)
- CESNET z.s.p.o.
- Various research partners worldwide
    - EVL, University of Chicago, IL
    - i2cat, Barcelona
    - commercial subjects (e.g., DAITE, movie post production studios Barrandov)
    - Comprimato Systems (spin-off)

Thank you for your attention!

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