AV Technologies and Collaborative tools at Masaryk University

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Brno, April 15, 2015

Agenda

Introduction

Videoconferencing Infrastructure

Support for lecture and event recordings

Research and development activities

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Videoconferencing Infrastructure

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Research and development activities

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

Roles of ICS MU

- 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), KYPO
- 2nd level user support (AV specialists) for complex issues

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Videoconferencing universes

- Skype
- H.323/SIP videoconference
- Webconferences – Adobe Connect

Reservation system

- Online reservation system for
  - virtual meeting rooms for videoconferences
  - physical rooms at CEITEC and ICS
- Integrated with Czech academic identity federation eduID.cz
  - Single login for all services
- Supports for H.323/SIP and Adobe Connect
- Provided by CESNET
- `https://meetings.cesnet.cz`

H.323/SIP Videoconferencing

- Up to 1080p audio and video transmissions
- 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+ participants)
  - virtual meeting rooms

H.323 infrastructure at Masaryk University

Terminals

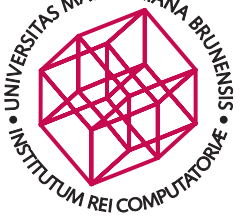
- SW clients for individual users (LifeSize ClearSea)
- VCF terminals integrated in meeting rooms and lecture halls (e.g., FI, ICS, UCB)
- Mobile VCF units (CESEB, CARLA, CEITEC, CERIT)
  - single-display solution (CESEB, CARLA)
  - dual-displays (CEITEC)

Infrastructure

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

H.323 infrastructure at Masaryk University

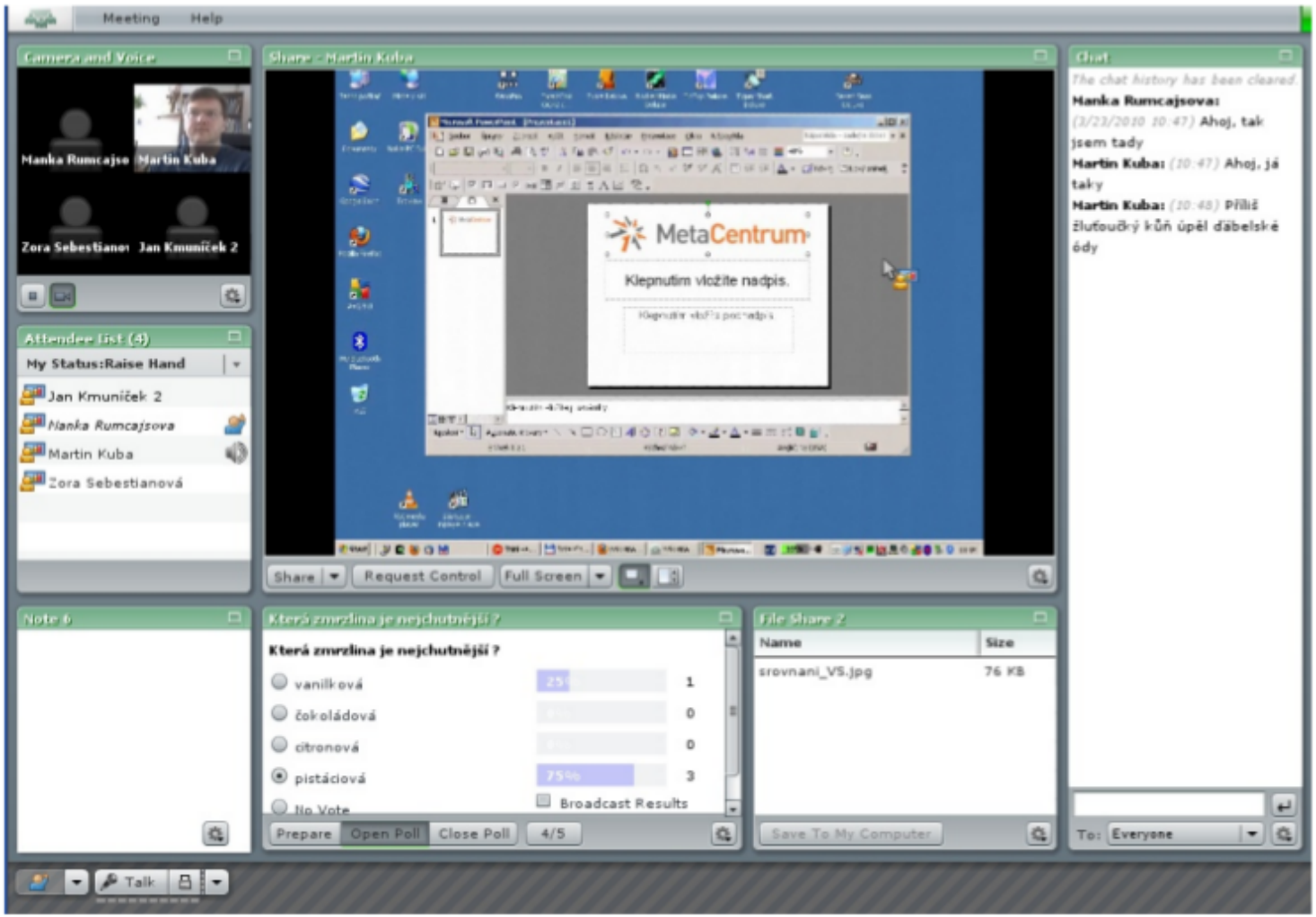
H.323/SIP Use-cases at MU



- Lecture recordings at UCB
- Remote lectures and consultations at Language Centre MU
- Conferences and ad-hoc events streaming
  - Acute medicine issues portal – Akutně.cz
  - Invited speakers (Madeleine Albright, Andrej Borisovič Zubov, Mendel Lectures series . . .)
  - Surgery operations (gynecology, opthalmology)

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


Meeting
Help
Camera and Voice
Manka Rumcajso
Martin Kuba
Zora Sebestianov
Jan Kmuníček 2
Share - Martin Kuba
MetaCentrum
Klepnutím vložíte nadpis.
Chat
The chat history has been cleared
Manka Rumcajsova:
(3/23/2010 10:47) Ahoj, tak jsem tady
Martin Kuba: (10:47) Ahoj, já taky
Martin Kuba: (10:48) Příliš žluťoučký kůň úpěl ďábelské ódy
Attendee List (4)
My Status:Raise Hand
Jan Kmuníček 2
Manka Rumcajsova
Martin Kuba
Zora Sebestianová
Share
Request Control
Full Screen
Note 6
Která zmrzlina je nejchutnější ?
Která zmrzlina je nejchutnější ?
vanilková 25% 1
čokoládová 0% 0
citronová 0% 0
pistáciová 75% 3
No Vote
Broadcast Results
Prepare
Open Poll
Close Poll
4/5
File Share 2
Name
Size
srovnani_VS.jpg
76 KB
Save To My Computer
To: Everyone
Talk

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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

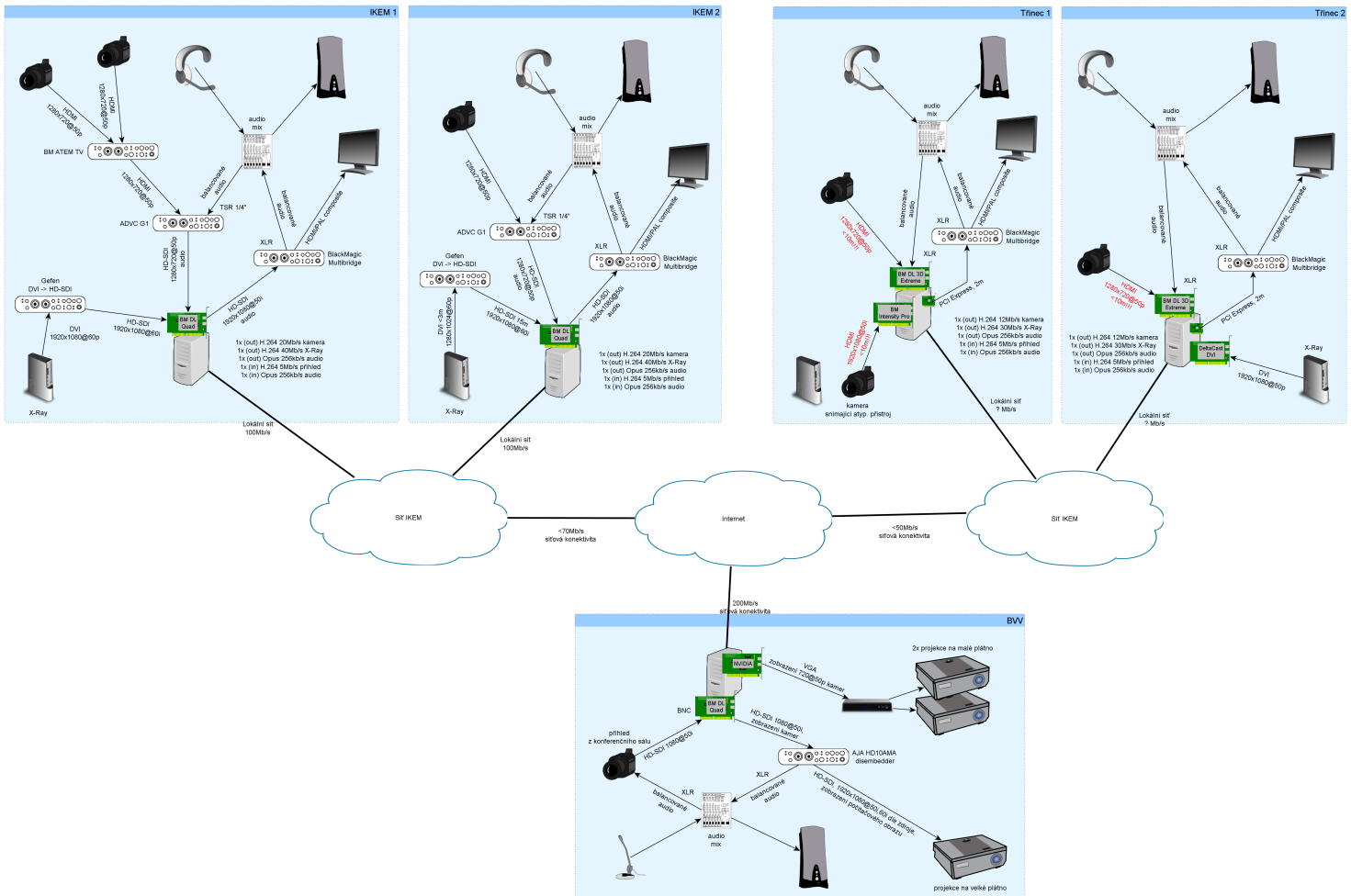
- Distributed encoding environment
- Used mainly for regular lectures
  - since 2001 at Faculty of Informatics
  - from student activity to production service
  - last couple of years also from the University Campus (using videoconferencing infrastructure)
  - infrastructure for video encoding.
  - available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

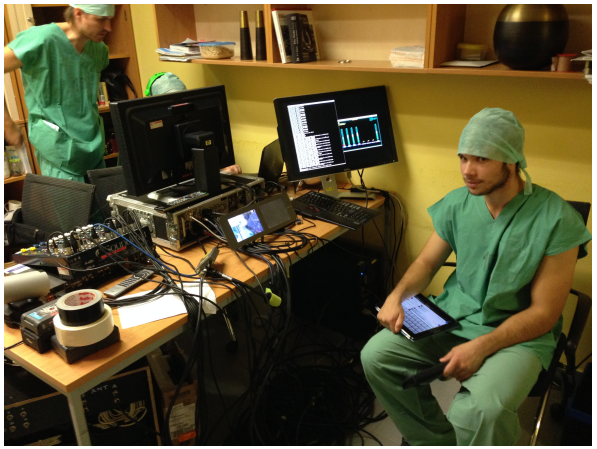
Ad-Hoc events

- Off-line recordings
  - manual post-processing
  - small autonomous teams
  - *e.g., Theater Play at FI, habilitation talks, Science 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, Mendel Lectures series
- 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)


IKEM 1
IKEM 2
Třinec 1
Třinec 2
BVV
audio mix
BM ATEM TV
ADVC G1
TSR 1/4"
BlackMagic Multibridge
Gefen
DVI -> HD-SDI
BM DL Quad
BM DL 3D Extreme
BM Intensity Pro 4
DeltaCast DVI
X-Ray
kamera snímající atyp. přístroj
Lokální síť 100Mb/s
Lokální síť ? Mb/s
Síť IKEM
Internet
<70Mb/s síťová konektivita
<50Mb/s síťová konektivita
200Mb/s síťová konektivita
NVIDIA
AJA HD10AMA disembedder
2x projekce na malé plátno
projekce na velké plátno
přihled z konferenčního sálu
audio mix



Using Video Sources and Displays
ČESKÁ TELEVIZE
FILM PRAHA
Powered by GPU/CUDA JPEG2000
SITOLA
CESNET
ciena
SURF NET

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Topics

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

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
  - ICT companies settled in CERIT-SP (DAITE, Comprimato Systems)
  - Movie post production studios

High-quality multimedia transmissions

UltraGrid

- Up to 8K (16× 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

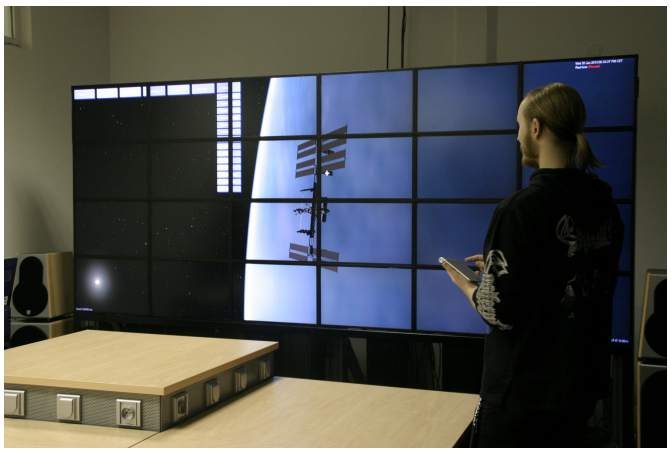
CoUniverse

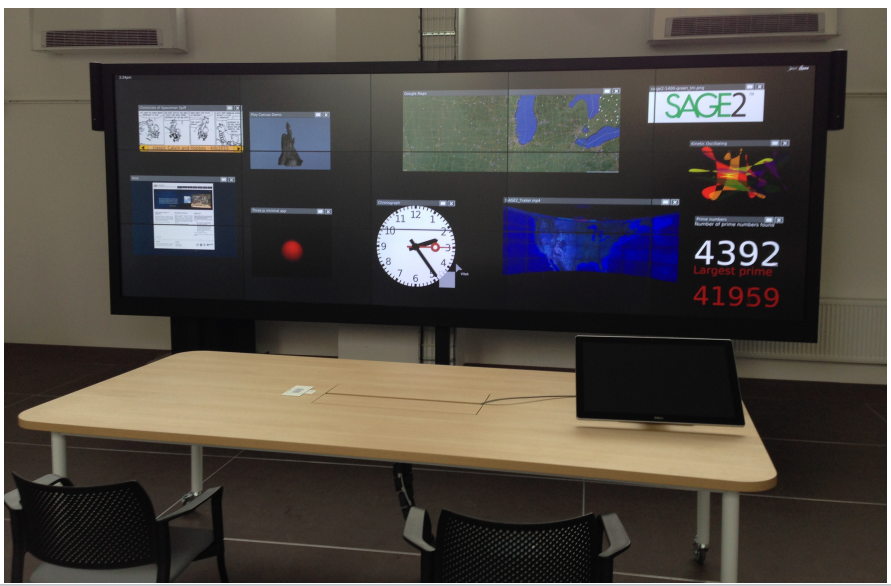
- Framework for self-organizing collaborative environments
- Research in scheduling strategies for multiple data stream transmissions
- Use case: Infrastructure for remote sign-language translation in seminars and lectures

Network Visualizer
Praha
Canada
Greenland
Россия
Russia
Kazakhstan
Mongolia
China
India
Taipei
senderTaipei
North Pacific Ocean
North Atlantic Ocean
Mexico
Brasil
Australia

Advanced group collaborative platforms

- Visualization cluster-based display walls and large tabletops
- Scalable Amplified Graphics Environment (SAGE2)
  - MUSE Framework
- Research in multi-user interaction methods and visualization
- Development of applications for specific purposes
  - Visualization of network flows, cyber-crime training platforms etc.




SAGE2
4392
Largest prime
41959

Thank you for your attention!

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