Welcome

Enabling Virtual Organizations

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EVO

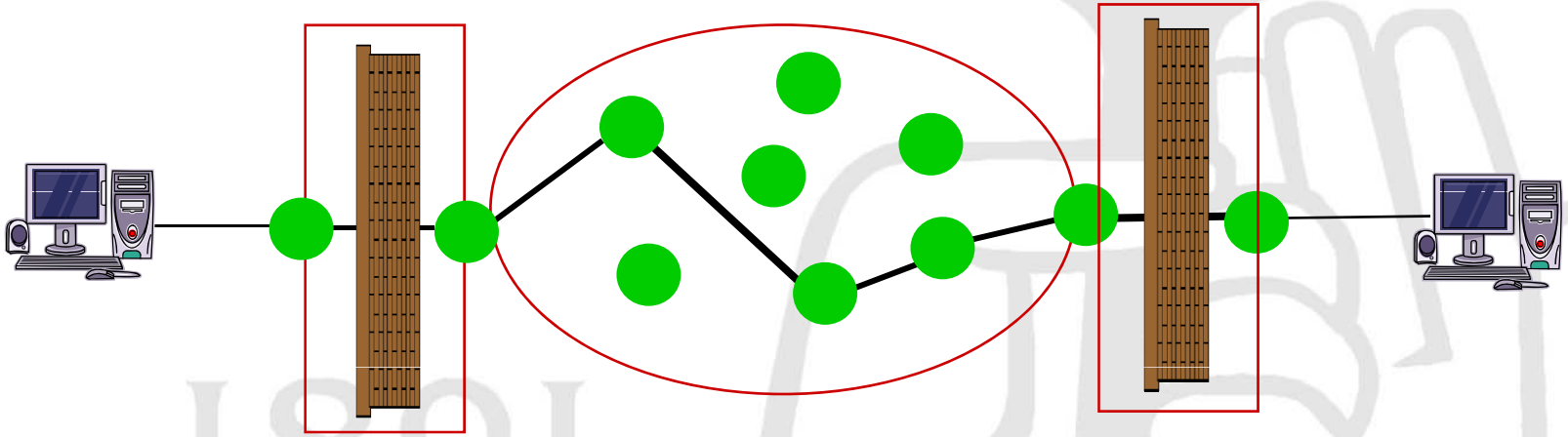
- **Why EVO?**
- **Concept**
- **Components**
- **Features**
- **Interoperability/integration**

Why EVO?

Why?

Why it is so difficult to achieve total reliability/robustness when deploying a RTC Infrastructure?

- The Real-Time Collaborative environment is a living environment: constantly changing, evolving
- In addition, devices/domains/nodes are managed by several independent technical and administrative entities.



Solutions ?

By creating a "living" RTC Infrastructure capable to react/adapt to the change of the environment in real-time transparently to the end-user.

EVO Methodology

Required Steps to create such infrastructure:

1. Monitor the environment
2. Detect any changes
3. Add intelligence into all infrastructure components to react to real-time changes
4. Spread the information and status to the network to obtain a global real-time view of the infrastructure
5. Remove all single point of failure

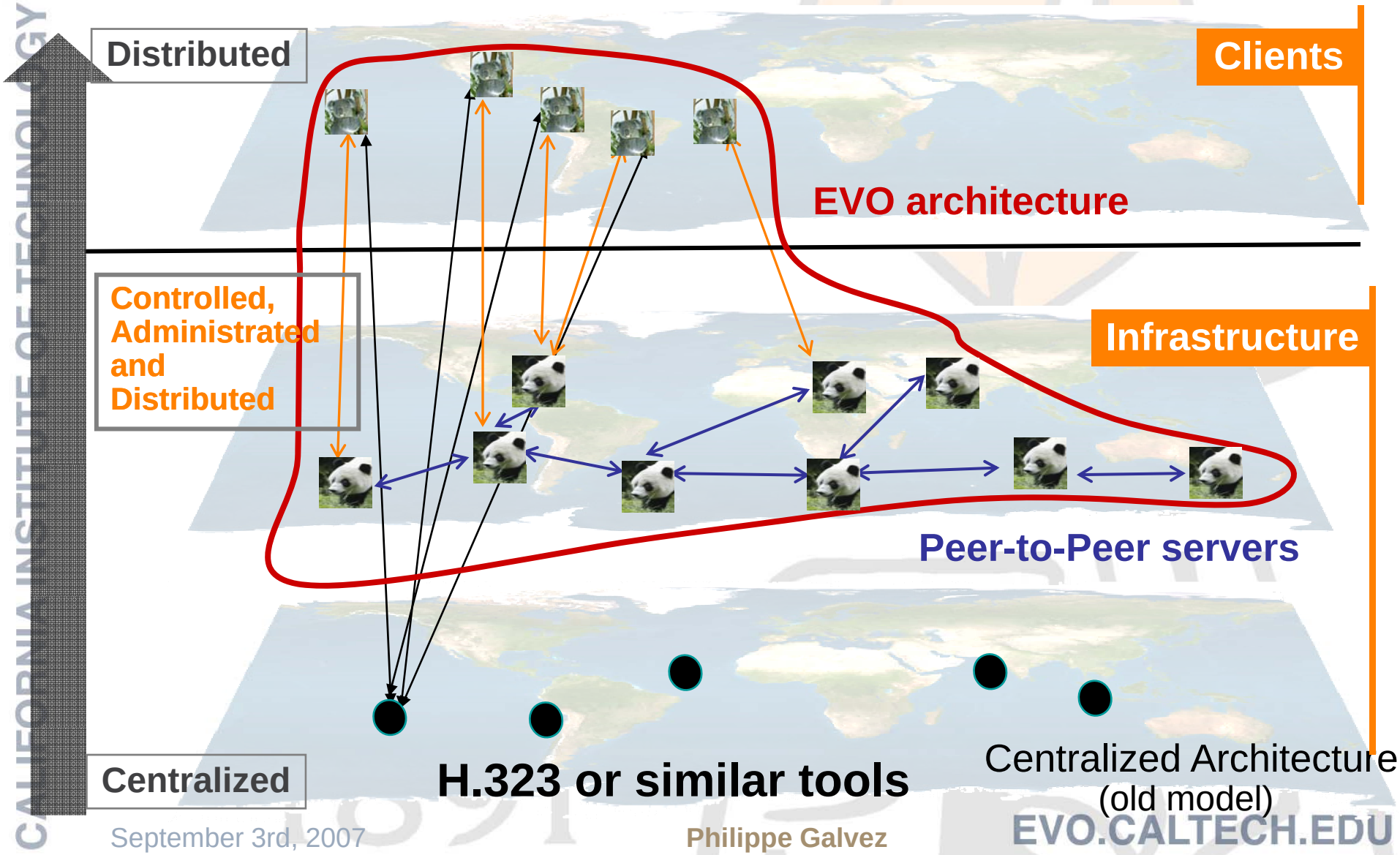
EVO Concept

EVO Components

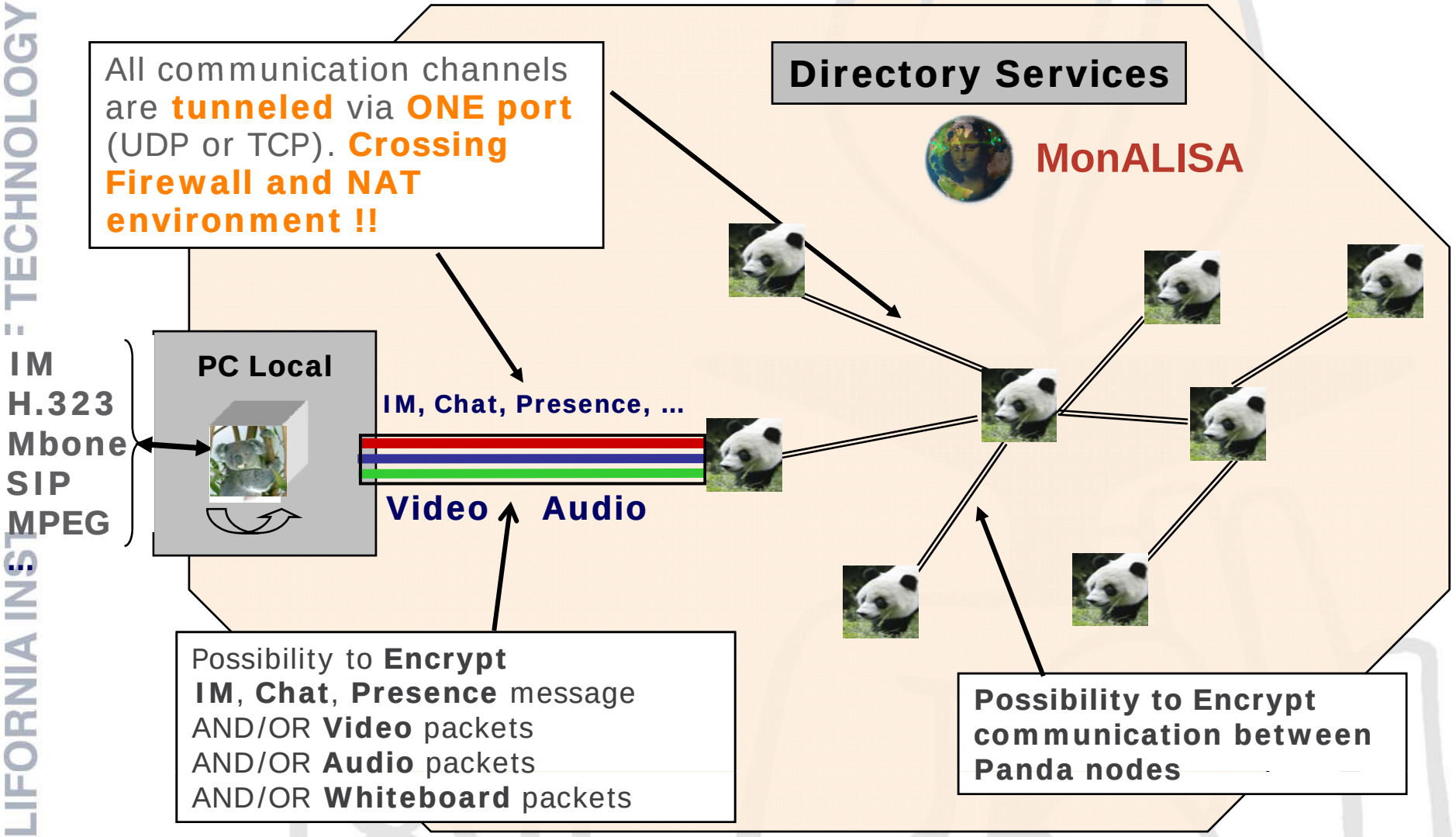
Each EVO components have the name of an animal.
They have their own intelligence and are autonomous.

- **Kangaroo: Gateway to connect any available EVO database servers (redundant).**
- **Panda: EVO server component that manage all the EVO real-time traffic. Several Panda create an EVO overlay network**
- **Koala: EVO client component. Starts and runs on the user machine and allow connection to the EVO service and functionalities.**

EVO Advanced Architecture



Secure Infrastructure



EVO Components

Panda: one EVO server

Panda

Some functionalities:

- **Dynamic registration** to high level directory services to provide global infrastructure view.
- **Automatic re-activation** of components and services.
- **Automatic** and secure **code update**.
- **Continuous monitoring** of network quality (packet loss, jitter, latency) between its peers and its possible peers.

Panda

Some functionalities (part 2):

- **Automatic rerouting to obtain the best performance/quality.**
- **Encryption between central nodes and between node and clients.**
- **Automatic Alarm notifications when monitored parameters (system or network) go beyond a preset threshold.**
- **Dynamically provides services (video, audio, data,..) that matches the current resources/capabilities to the end users/applications.**
- **Access to real-time and historical data.**

Koala : EVO Client

Koala

Some functionalities:

- Our **Client** is platform independent: Java based
- Automatic **Detection** of:
  - **systems parameters** (CPU, Memory,..)
  - **hardware** components (audio card, video card, …)
  - **capabilities** in term of service (video, audio, …)
  - **network environment** and **capabilities** (wireless environment, DSL, available bandwidth, …).

Koala

Some Functionalities (part 2)**:**

- **Dynamically get services (video, audio, data,…) that matches the current resources/capabilities to end users/applications.**
- **Continuous monitoring of network quality (packets loss, jitter, latency), and automatic rerouting of packets.**
- **Automatic Alarm notifications a when monitored parameters (system or network) go beyond a preset threshold.**
- **Adaptive configuration of client applications to fit the current hardware and network capabilities.**

EVO features

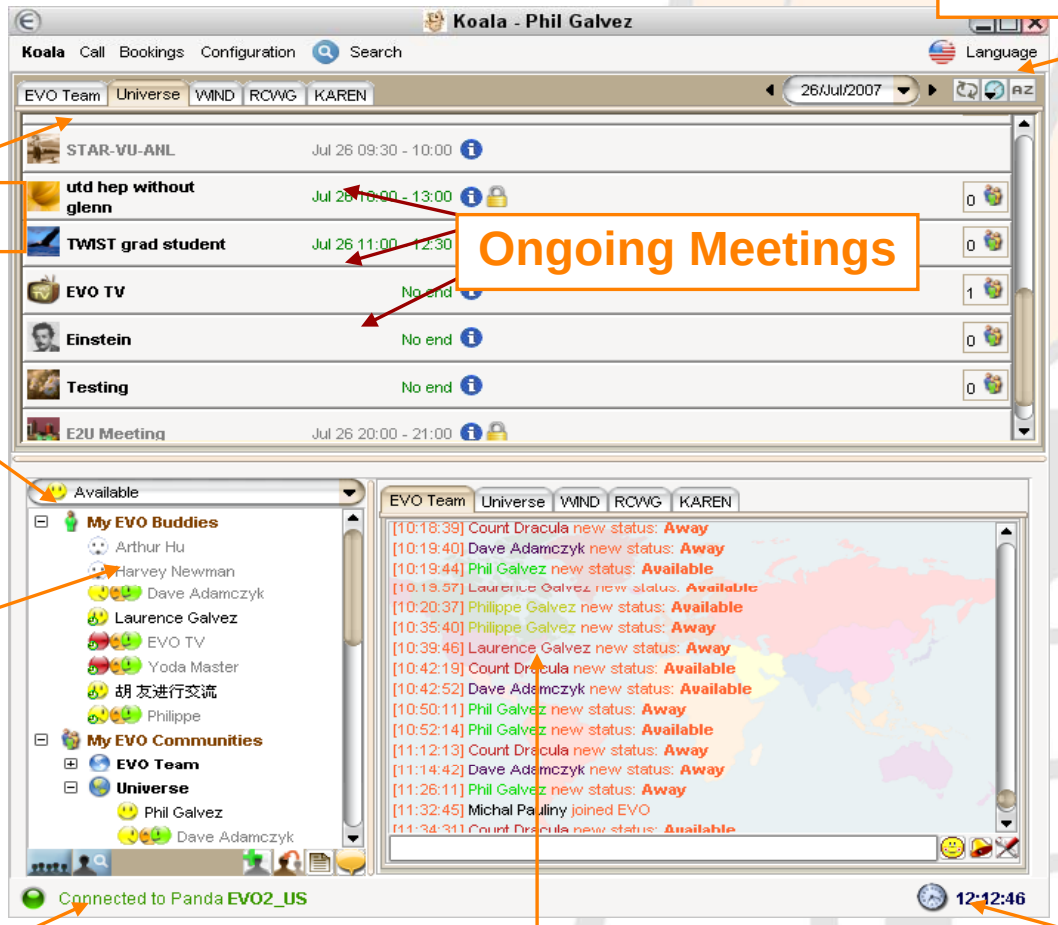
Overall System Capabilities(1)

- **UDP et TCP tunneling in one Port. Network Address Translation and Firewall transversal.**
- **Encrypt Video and/or Audio and/or Whiteboard and/or IM/Chat and/or data.**
- **IPv6 world is connected to the EVO IPv4 network via our dedicated servers.**
- **Plug-in concept: communication system and interface is provided to allow additional functionalities (authentication, booking, agenda…).**
  - ***API to allow external development.***

Overall System Capabilities(2)

- **Multilanguage support (currently 10 languages supported)**
- **Support any type of video client/protocols: H.323, SIP, Mbone, etc…**
- **Administration of meetings: Become a meeting moderator; Mute/Unmute video/audio of a participant, kick-out a participant, add a new participant as moderator.**
- **Sharing of computer screens between participants of the same meeting.**

Koala Main Interface



Multi language Support

Communities

Ongoing Meetings

Presence

Buddy

Connection to the Panda

Chat

Automatic Time Zone Adjustment

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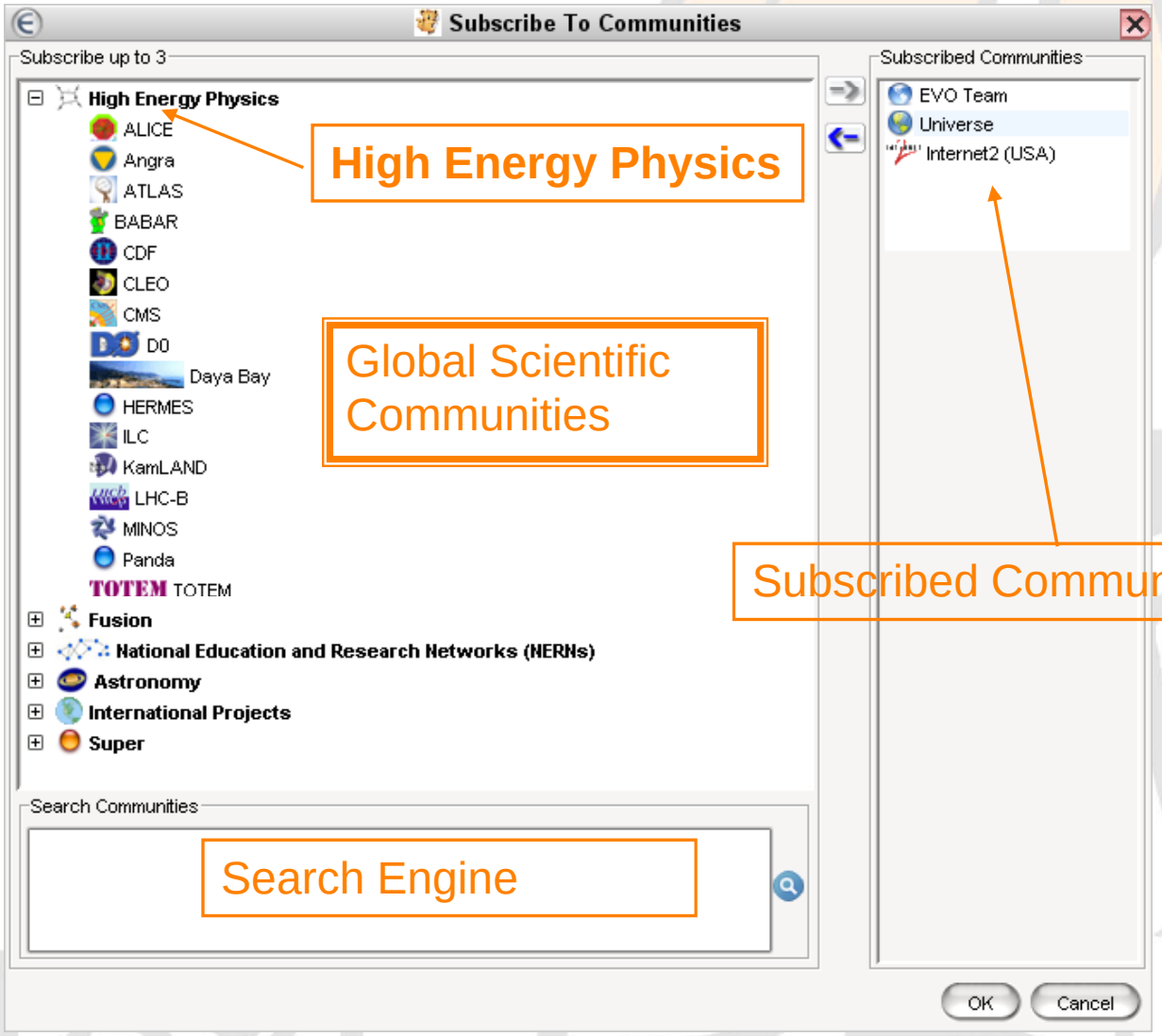
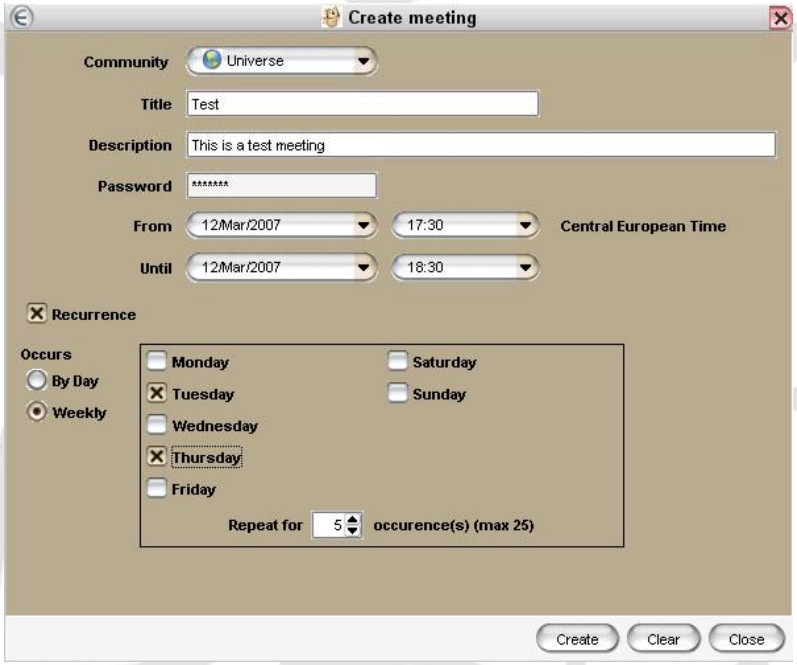
Global Communities Management



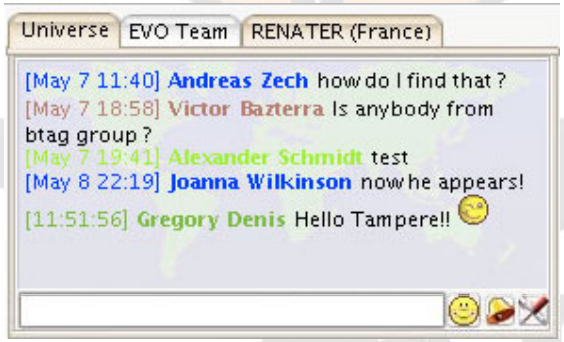
Booking

- Book a schedule meeting
- Start an Ad-hoc meeting
- Invite a buddy to a private meeting
- Have permanent meeting room
- Restrict access by a password



Instance Messaging / Chat

- **IM Presence information of each user is available.**
- **Ability to force your presence status**
- **Each user can add EVO users to his buddy list.**



- **Possibility to initiate a private Chat session with any EVO user even if you are not in meeting with them.**
- **A global Chat session exists for each community.**
- **A public Chat session is opened at each meeting.**

Koala in Meeting Interface

Exchange/Share files

Participants of the current meeting

Open/Close Recorder & Playback

Control Audio, Video and Whiteboard

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EVO Audio Application

JRAT : Java Robust Audio Tool

- Platform independent (Java Code)
- Better audio quality : 16Khz
- 3 possible choice in quality/bandwidth
- Ability to choose different devices for playing audio and recording audio.
- Automatic Silence Suppression
- Automatic Gain Control of the input level
- Higher range of volume
- Mixing all audio streams

EVO Video Application (1/7)
(VRVS/EVO Slovak team)

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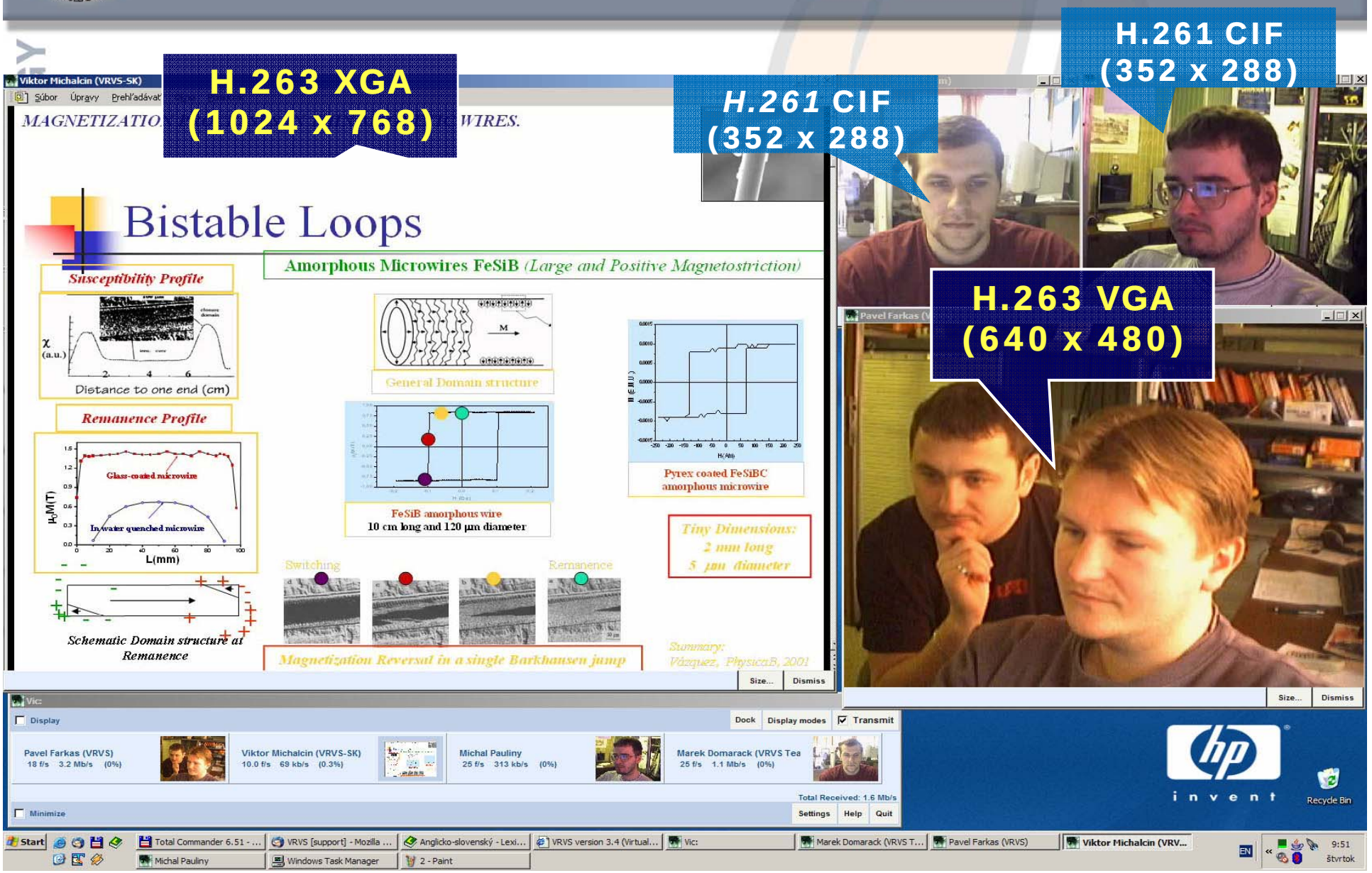
ViEVO:

- 3 possible **sources**:
  - **Video Camera** (USB, Firewire)
  - **Current Computer Desktop** (or part of)
  - **A Still Image**
- 2 possible **codecs**:
  - **H.261 fully compatible with all H.323 hardware clients**
  - **H.263 from QCIF to XGA resolution**
  -
- 3 possible **platforms**:
  - **Microsoft Windows**
  - **Linux**
  - **Mac OS X**

H.263 codec in ViEVO (2/7)

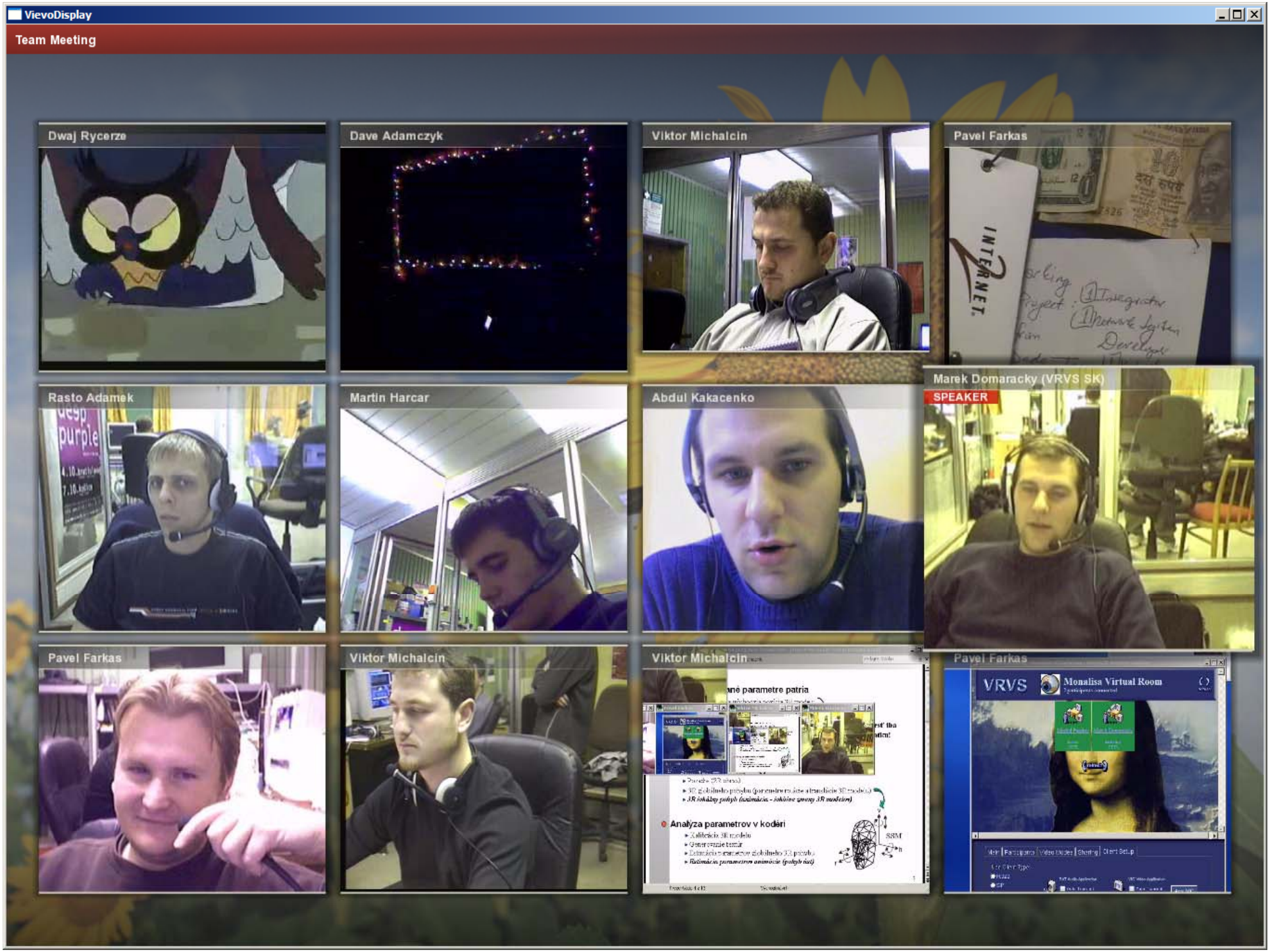


ViEVO Application (3/7)

OpenGL version

use of 3D technologies for 2D videos

- **OpenGL technology is available in all platforms.** So far only the Windows version has been released.
- **Display all the selected videos into a single window.**
- **Real time resizing of all videos when the window is stretched.**
- **Increase the quality of the video displayed (filters).**
- **Videos are rendered and displayed by the GPU.**
- **Decrease the CPU usage.**

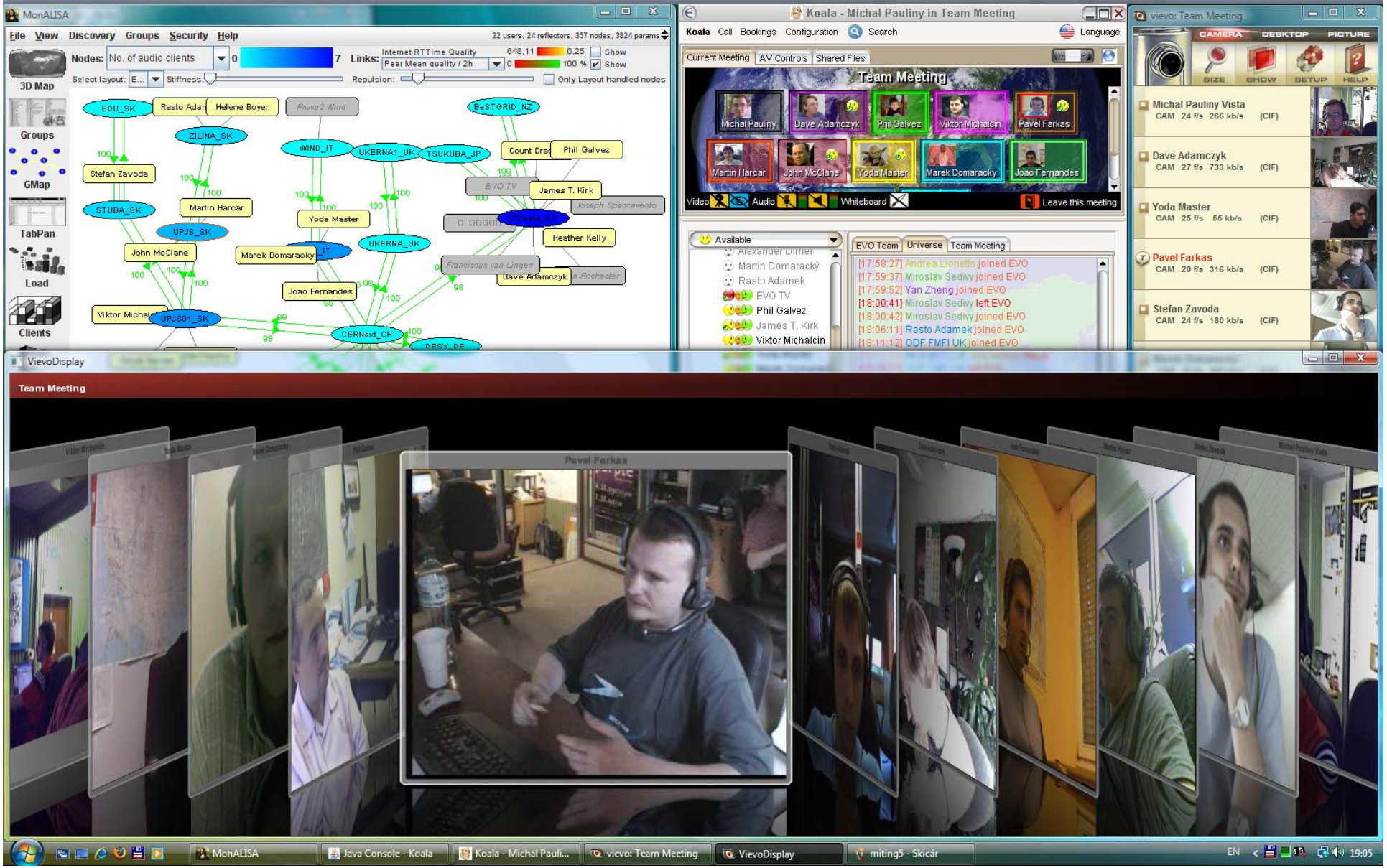

VievoDisplay
Team Meeting
Dwaj Rycerze
Dave Adamczyk
Viktor Michalcin
Pavel Farkas
Rasto Adamek
Martin Harcar
Abdul Kakacenko
Marek Domaracky (VRVS SK)
SPEAKER
Pavel Farkas
Viktor Michalcin
Viktor Michalcin
Analýza parametrov v kodéri
Pavel Farkas
VRVS
Monalisa Virtual Room

ViEVO Application (5/7)

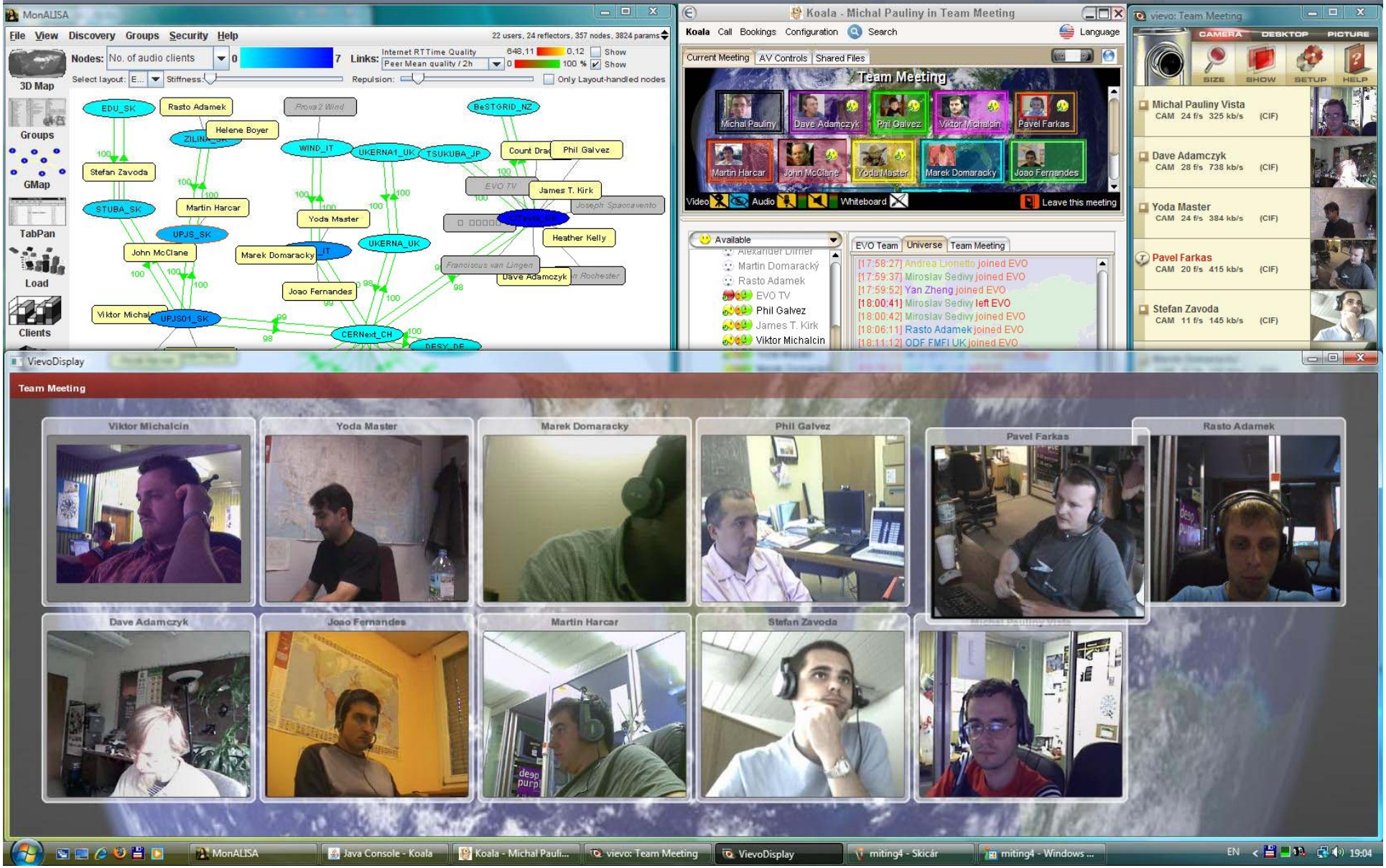
OpenGL version

- Real time:
  - Transparency
  - Shadows
  - Text over video
  - Rotation in 3D space
  - 2D and 3D special effects
  - Bitmap background
  - Title of the meeting

ViEVO Application (6/7)



ViEVO Application (7/7)



EVO Whiteboard Application
(VRVS/EVO Slovak team)

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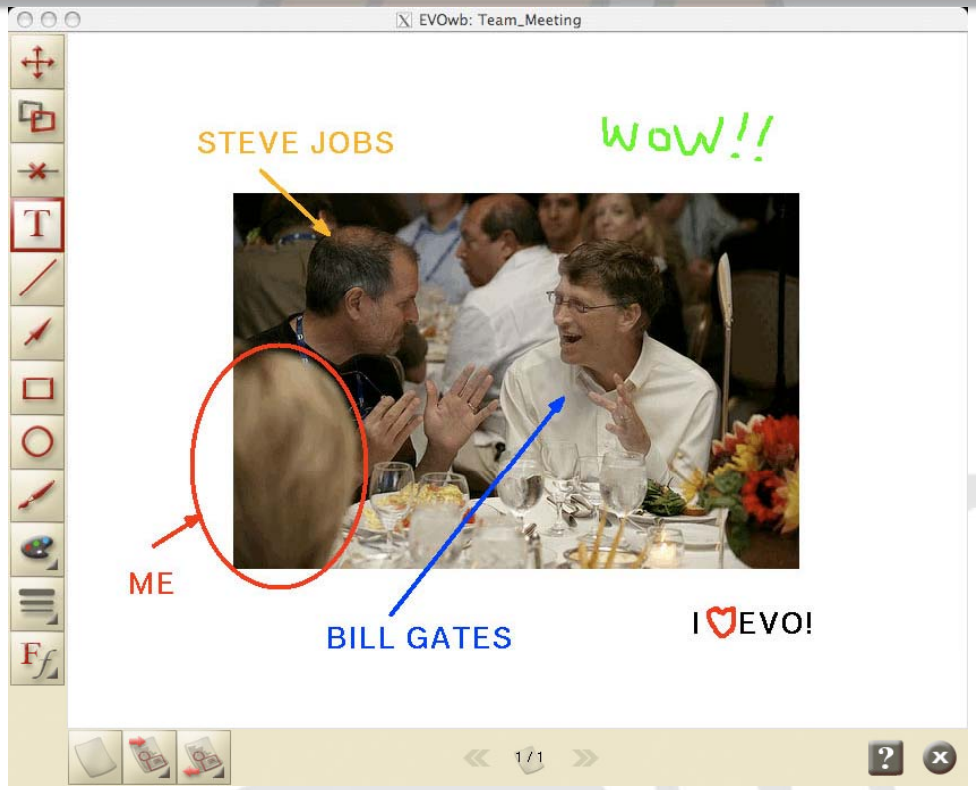
Whiteboard



- Works on 3 Platforms
- Multiple pages capability
- You can import Image and Text files
- Each component in the page can be:
  - ✓ moved
  - ✓ duplicated
  - ✓ deleted

Meeting Recorder

Record a full EVO meeting into your local disk.

- Possible to PAUSE the recording
- You can add Marks during the recording
- Possible to record:
  - Audio
  - Video
  - Whiteboard
  - Chat
  - Participants

Meeting Player

Playback a full EVO meeting from your local disk.

- The playback could be:
  - Local *(for your eyes only)*
  - Broadcasted
- Possible to PAUSE the playback

- You can go to the previous/next pre-recorded marks
- Possible to play:
  - Audio
  - Video
  - Whiteboard
  - Chat
  - Participants

Aparté (private audio discussion)

Aparté allows during an ongoing meeting to initiate a private audio discussion with a selected participant of the current meeting.

The private discussion starts as soon as the selected participant accept your request.

You can mute or not the audio from the meeting.

File exchange

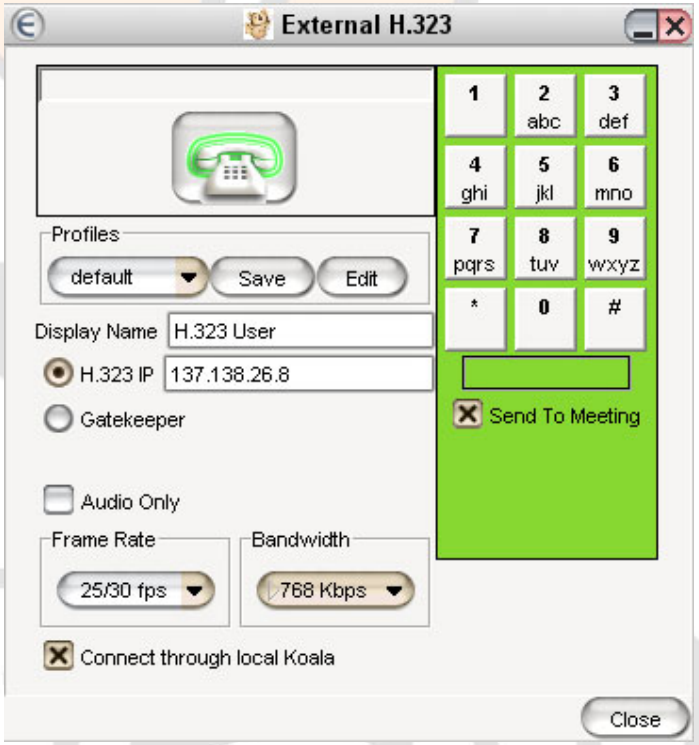
- Exchange any files between EVO users even if they are not in a meeting (or not in the same meeting).
- In a meeting a shared space allows to upload and download files (during the meeting duration).

- No limit in file size and in number of files.

EVO Integration / Interoperability

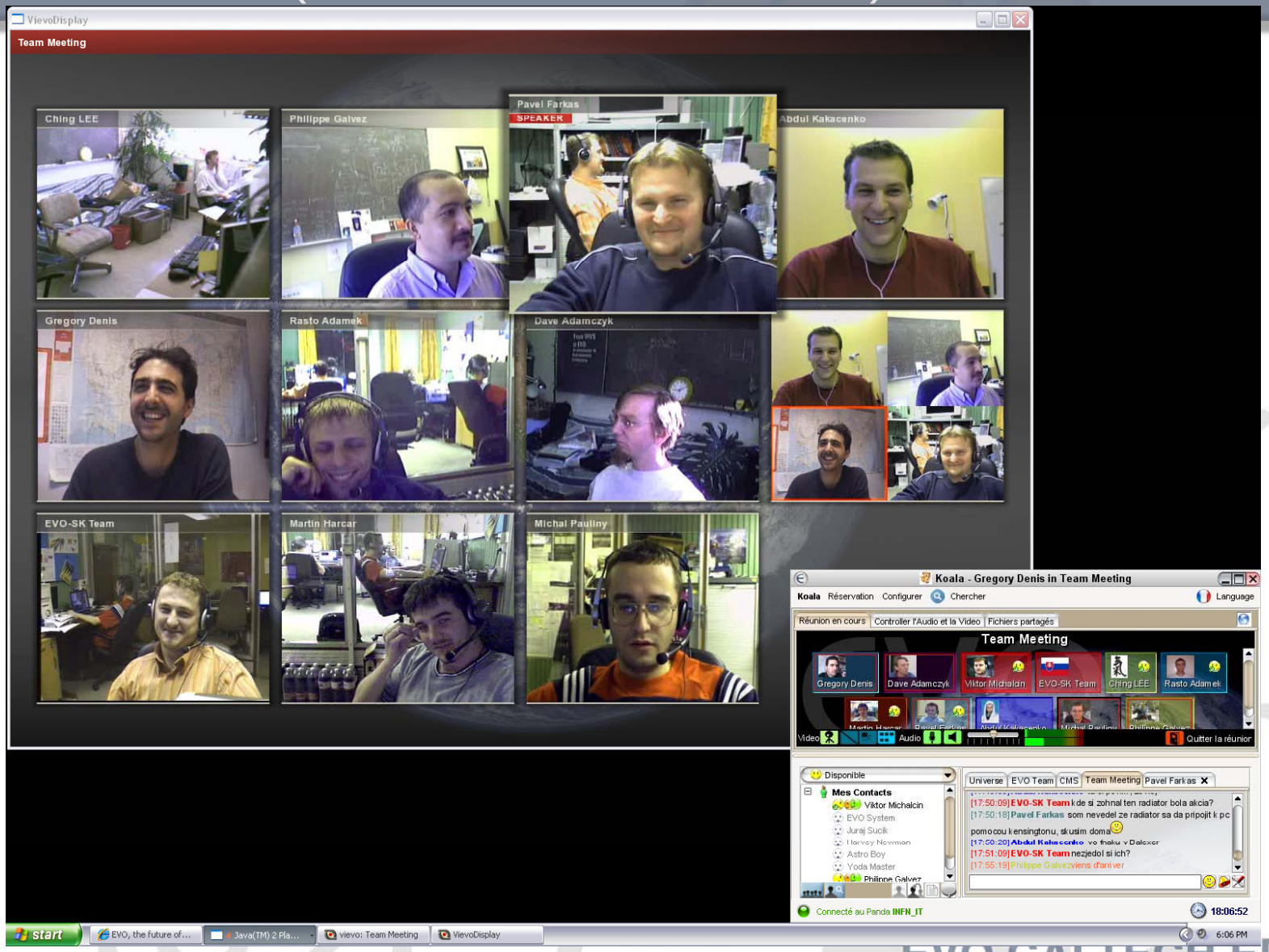
H.323 Integration

- Allow to connect:
  - Local software H.323 client
  - External H.323 client
  - H.323 MCU
  - H.323 Telephone
- Mixing of Audio
- Transcoding of videos:
  - Can reduce bandwidth
  - 4 videos into 1 CIF
- Compatible Gatekeepers
- Avoid Firewall restrictions



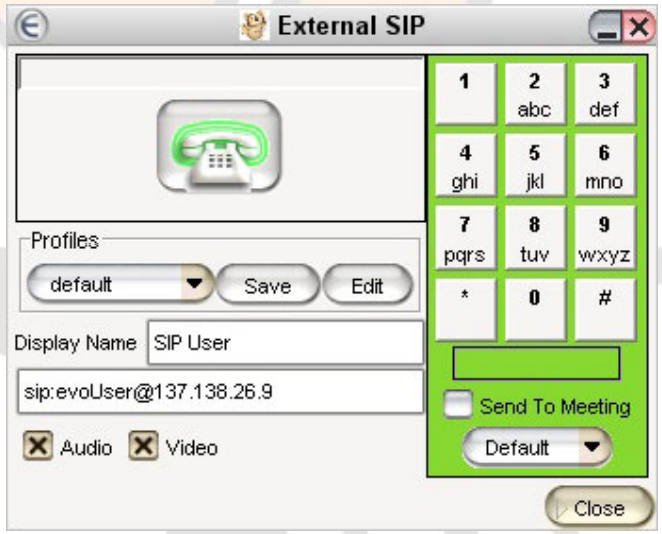
Video Transcoder

(VRVS/EVO Slovak team)



SIP Integration

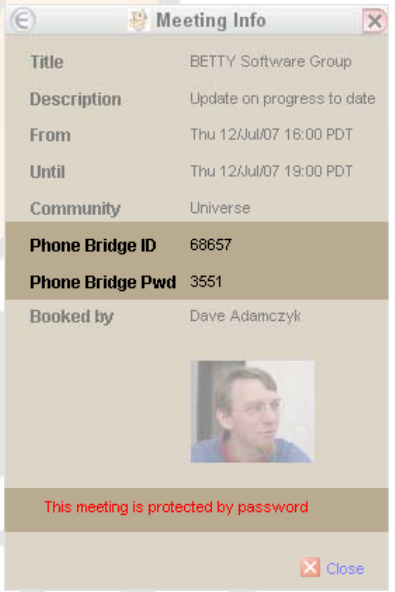
- Allow to connect:
  - Local software SIP client
  - External SIP client
  - SIP Gateway
  - SIP Telephone
- Mixing of Audio
- Transcoding of videos:
  - Can reduce bandwidth
  - 4 videos into 1 CIF
- Avoid Firewall restrictions



Phone (POTS) Integration

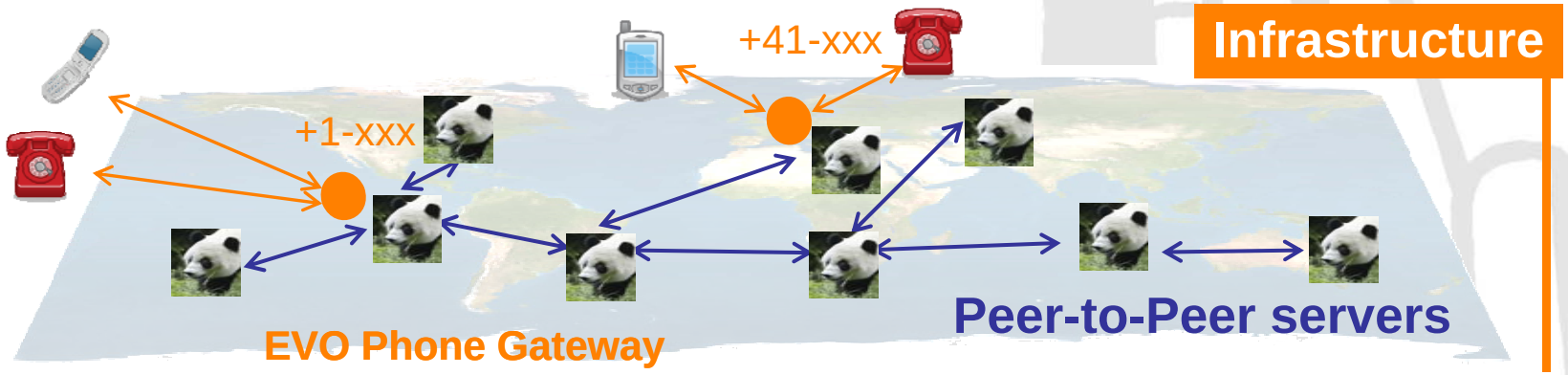
- Meeting conference ID (and password if setup are automatically created for all EVO meeting

- All EVO users connected by Phone are visible and the meeting moderators is capably to mute/unmute/kick-out any phone users



EVO Distributed Phone Conference Infrastructure

- **Install a EVO Phone Gateway to major sites and HEP institutes so the cost of the phone line to participant to the same meeting is only national/local**
- **Currently, gateway are running at Caltech, CERN and several others are in process to be installed. Anyone interested ??**
- **Cost to install a EVO Phone Gateway hardware (US$300 for 8 ports)**
- **If only 10 institutes set-up 100 ports each, it will provide a pool of 1,000 phone connections for the HEP community worldwide**



EVO: End-to-End Self Managed and Secure RTC Infrastructure

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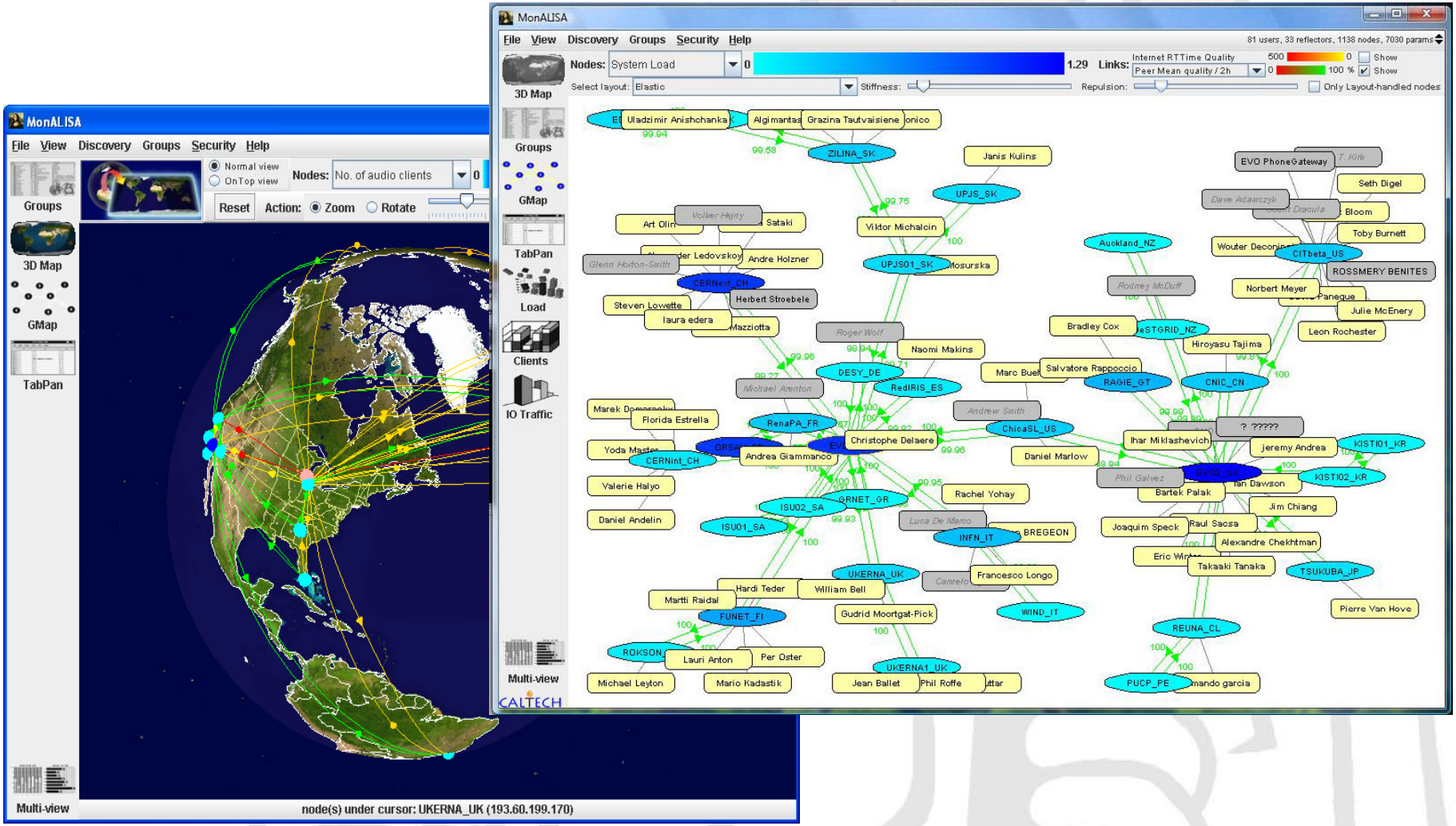
EVO APIs for Integration with other systems/portals

Our APIs development is currently focused in 3 main areas

- Be able to book/read EVO meetings remotely. It allows the integration with local calendaring/booking system such as IndiCo, etc
- Access to EVO general information (user's presence, status, on-going meetings, click to join, etc...). It will allow to integrate these information into local web portal.
- Plug-ins to be developed by external community to add in the Koala client to address some particular/local needs. We have all the real time EVO mechanism/infrastructure to transmit and receive any types of information between all the Koala clients.

It could be used to developed new applications, send physics information from the control rooms, broadcast information or alarms,..

MonALISA / EVO Integration: End-to-End Self Managed RTC Infrastructure



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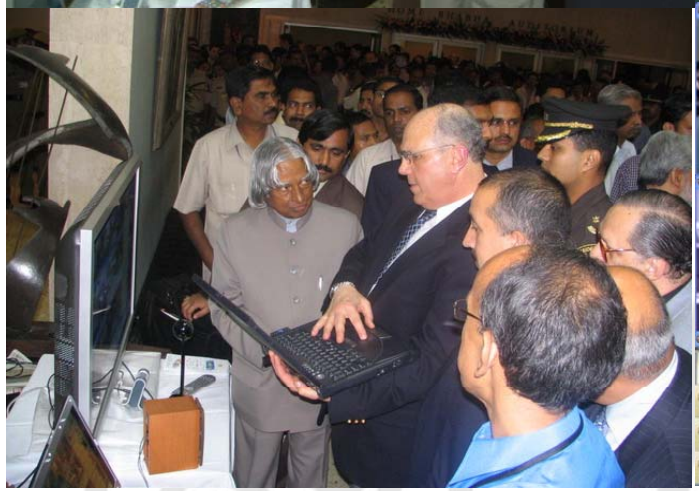
Particle Physics MasterClasses: March 2007

4500 high-school students from some 70 institutes across Europe and the US spent two weeks working at the frontier of physics in the second International Masterclasses for High-School Students.

EVO Session

With the India President, Dr A.P. J. Abdul Kalam



Thank you

EVO.caltech.edu

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