Mconf and WebRTC

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Agenda

- Background
- A bit of history
- Mconf and WebRTC
- Mconf Academic Network
- Final remarks


Porto Alegre
Brasil
Atlantic Ocean
Sargasso Sea
Gulf of Mexico
Caribbean Sea
South Atlantic Ocean
Cuba
BS
DO
BZ
GT
HN
NI
CR
PA
Venezuela
Colombia
Ecuador
Perú
Bolivia
Paraguay
Uruguay
Argentina
Chile
Cabo Verde
Sénégal
The Gambia
Guiné-
Mali
Niger
Nigeria
Ghana
Cameroun — Cameroon
Gabon
Tchad
Eritrea
South Sudan
Ethiopia
Kenya
Tanzania
Angola
Zambia
Namibia
BW
ZW
MZ
South Africa
España
PT
Italia
MK
AL
Ελλάδα
Türkiye
Azerbayc
المغرب
الجزائر
ليبيا
مصر
السعودية
العراق
الأردن
موريتانيا
السودان
اليمن

Background

- PRAV research group at Federal University of Rio Grande do Sul
  - Computer Networks and Multimedia
- Many years of experience developing real-time applications
  - Videoconference applied to telemedicine and education

PROJETOS EM ÁUDIO E VÍDEO
PRAV

GT-Mconf

- Started in October 2010
- Innovation program by the Brazilian NREN (RNP)
- Proposed by prof. Valter Roesler
- Aimed to build a videoconferencing system easy to use and accessible by computers and mobile devices

Working Groups Program

- Call for proposal once a year
- A few projects selected every year

- 1st year: prototype
- 2nd year: pilot
- 3rd year: service

GT-Mconf

- Research on various applications (video/web conferencing + management), mostly open source

- Isabel Videoconference
- Global Plaza
- Virtual Conference Centre (VCC)
- OpenMeetings
- MediaMosa
- Kaltura
- DimDim
- VMukti
- EVO
- Opencast Matterhorn
- Opencast Steeple
- Access Grid
- CineGrid
- Janet
- BigBlueButton

GT-Mconf

- Back in 2010
  - HTML5 specification was incomplete
  - No WebRTC

GT-Mconf

- Research on various applications (video/web conferencing + management), mostly open source

- Isabel Videoconference
- **Global Plaza**
- Virtual Conference Centre (VCC)
- OpenMeetings
- MediaMosa
- Kaltura
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- Opencast Matterhorn
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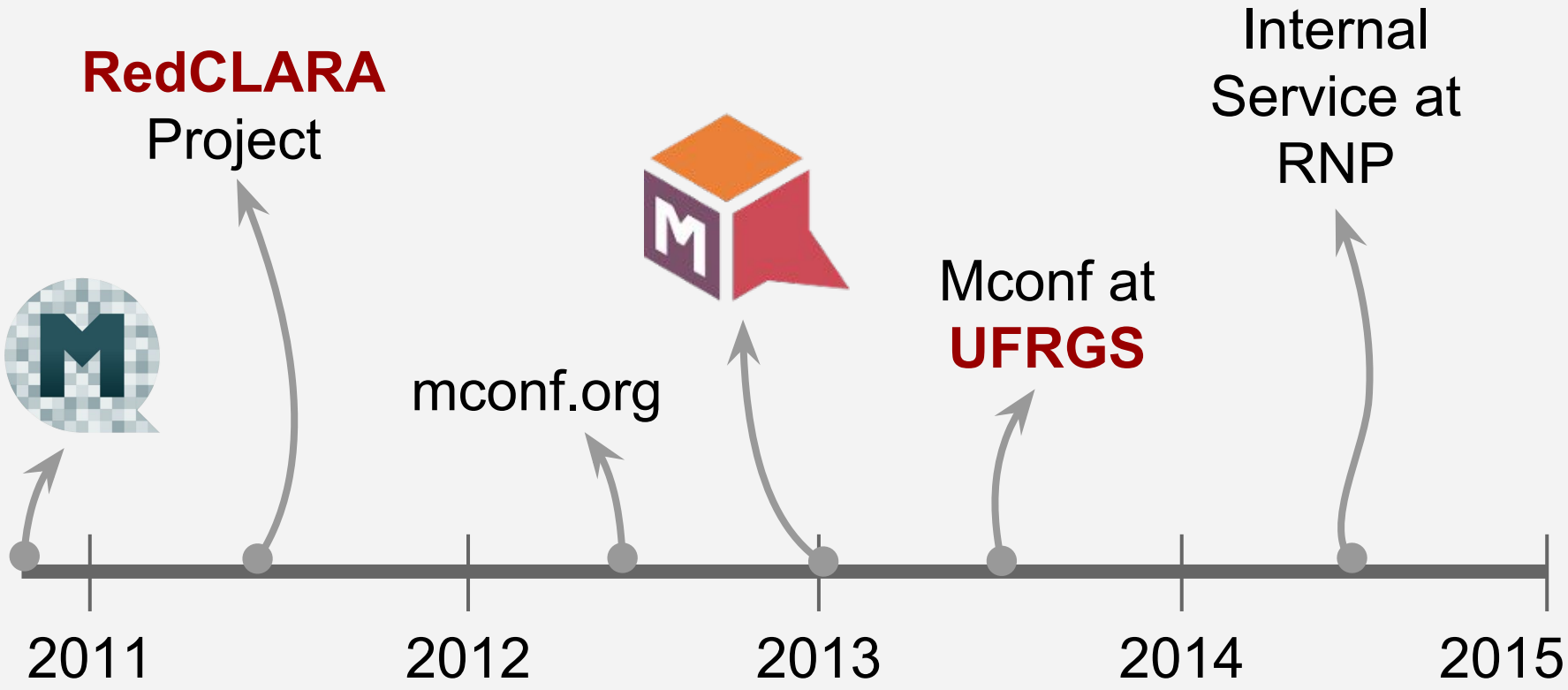
- Access Grid
- CineGrid
- Janet
- **BigBlueButton**

Timeline



RNP

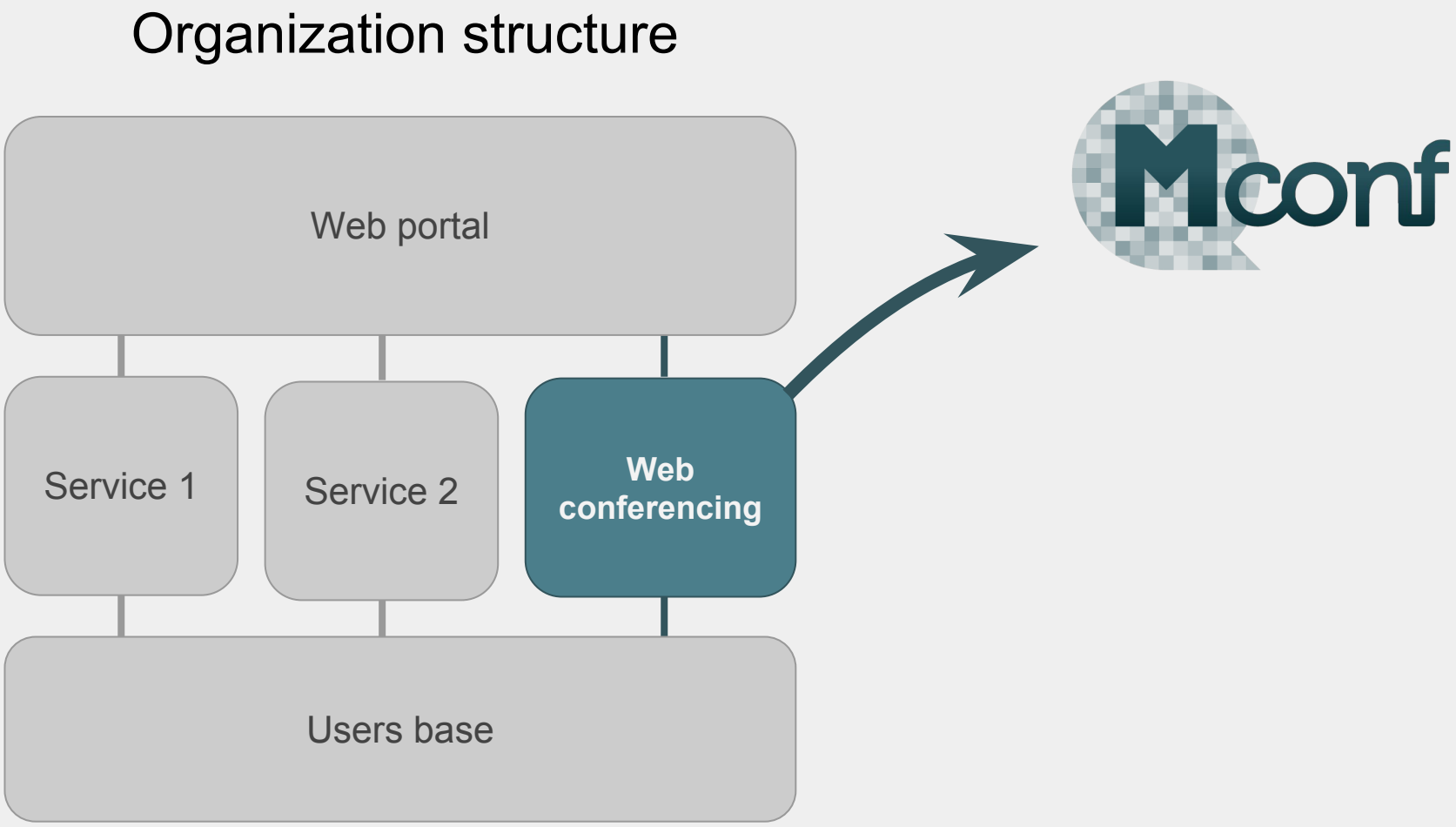
Key aspects of Mconf

Integration

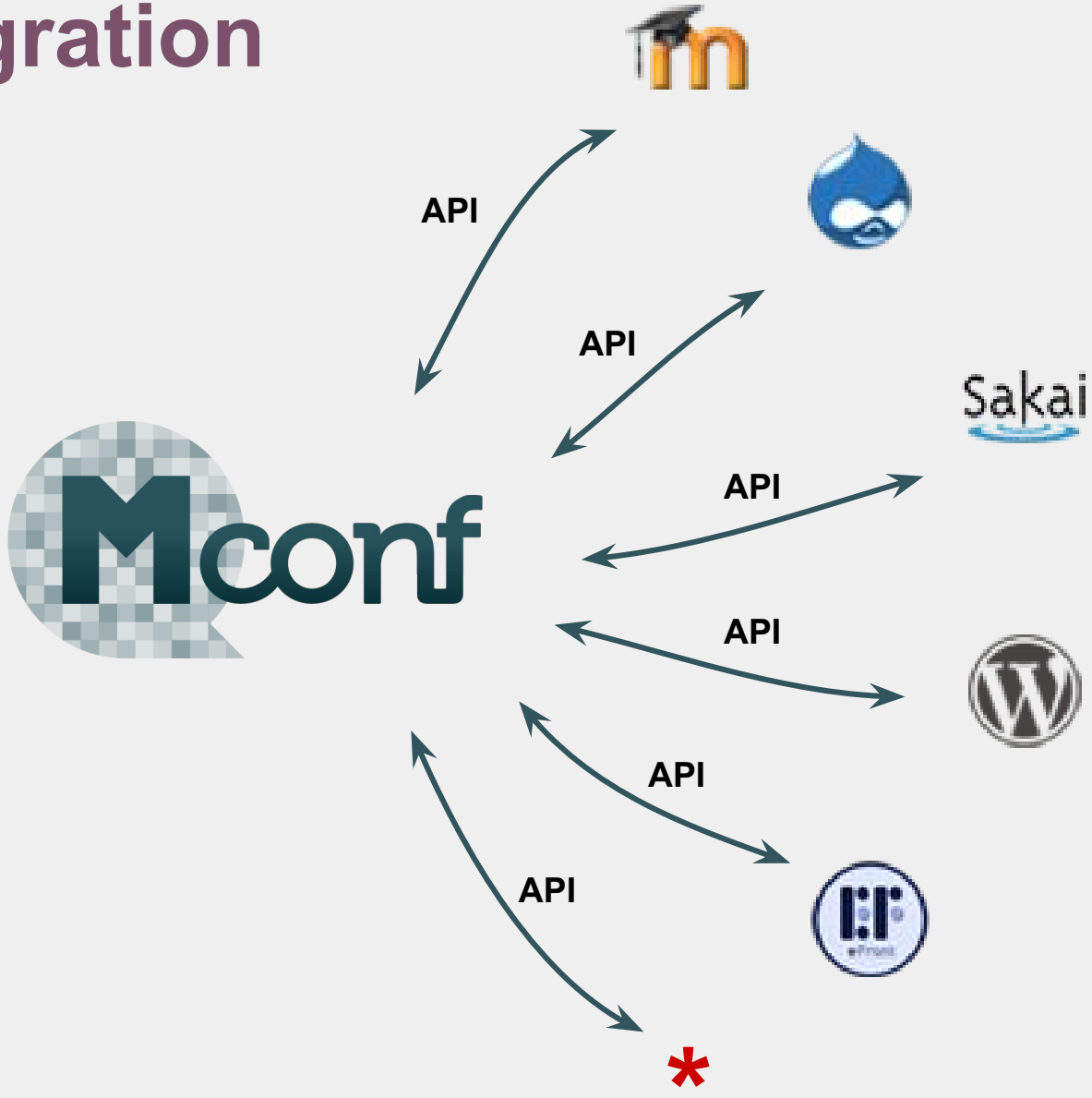
Customization

Open Source

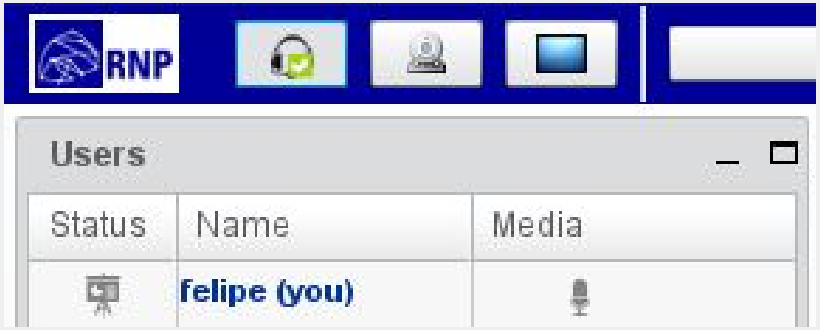
Integration



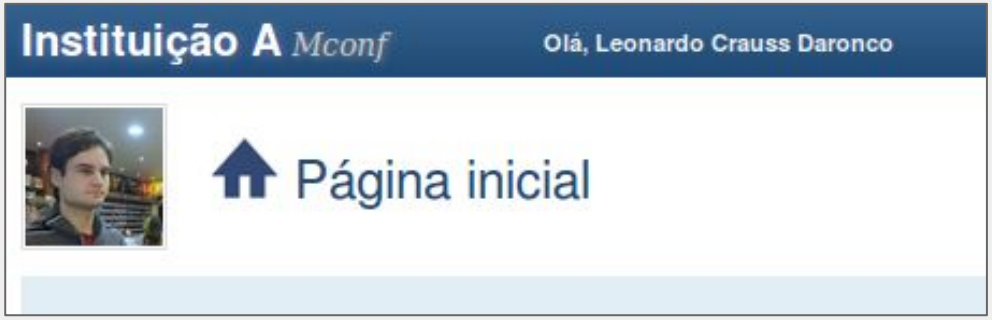
Integration

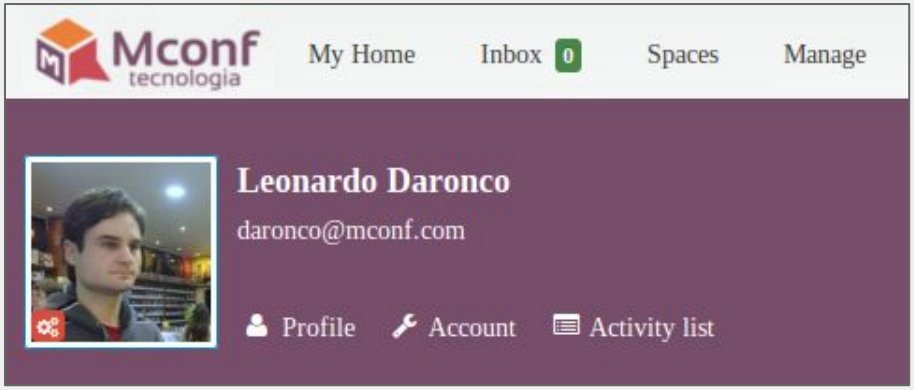


Customization



Customization





Open source

- Collaborative development
- More developers
- More users
- More organizations working towards the same system

=

- More solid and stable product
- More reliability and longer life time
- Less dependency on a single service provider

Mconf is not BigBlueButton!

Mconf-Live is based on BigBlueButton

Many contributions from Mconf back to the BigBlueButton core

Collaborative development

* weekly meetings, shared roadmap
* developer summits

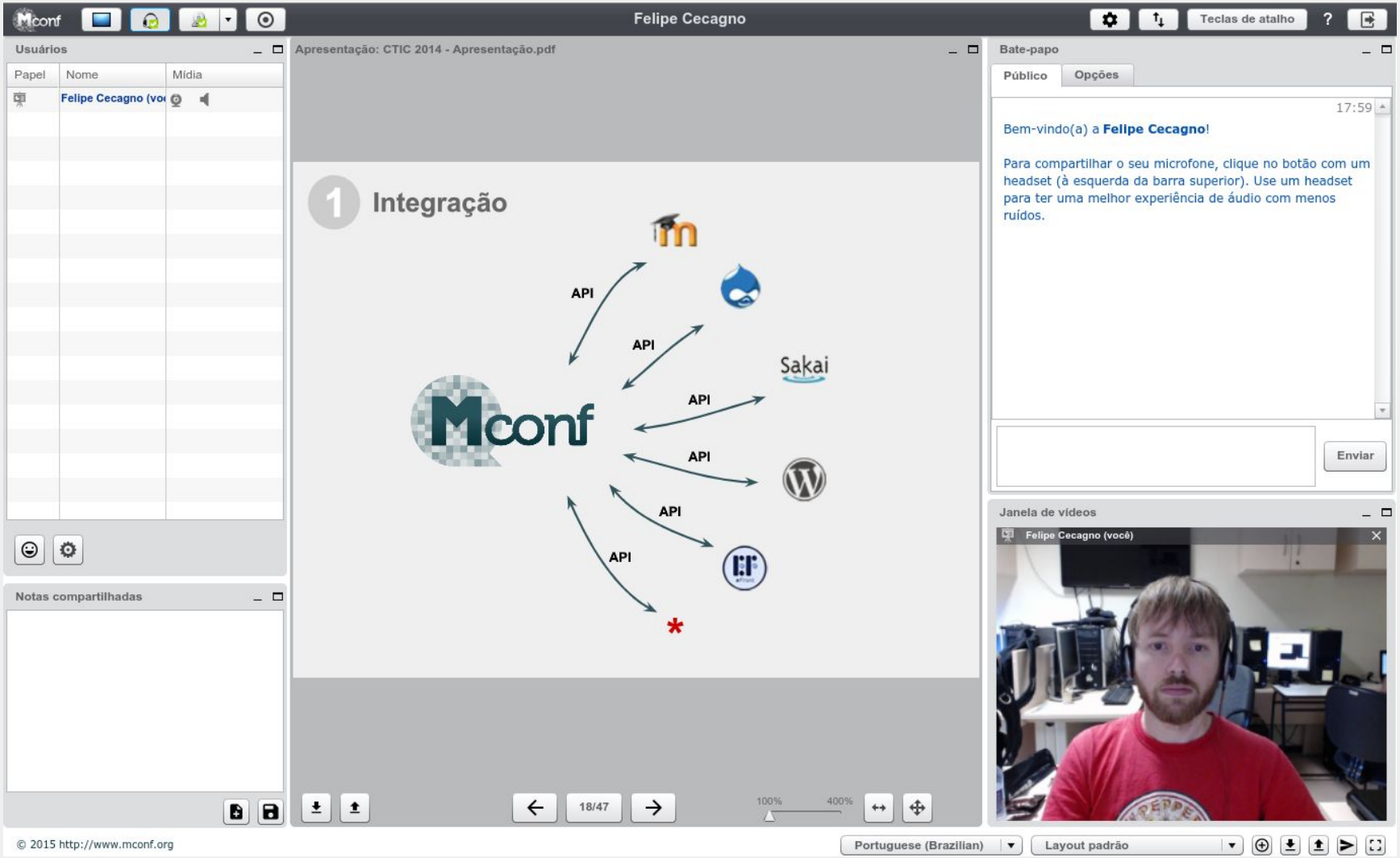
Main contributions to BigBlueButton

- Window for videos (video dock)
- Videos in the recordings
- Ability to share multiple cameras
- Extensions to the API
- Mobile client with Adobe Air (bbb-air-client)
- Hooks for external applications on events
- Layout module
- ...

Only on Mconf-Live

- Shared notes
- Ability to download the presentation and chat
- WebRTC reconnection
- Brandable logo
- Distributed recordings
- Emojis
- Guest access
- Fullscreen
- ...

Mconf-Live


Felipe Cecagno
Teclas de atalho
Usuários
Papel
Nome
Mídia
Felipe Cecagno (vo
Apresentação: CTIC 2014 - Apresentação.pdf
1 Integração
API
API
API
API
API
API
Mconf
Sakai
Bate-papo
Público
Opções
17:59
Bem-vindo(a) a Felipe Cecagno!
Para compartilhar o seu microfone, clique no botão com um headset (à esquerda da barra superior). Use um headset para ter uma melhor experiência de áudio com menos ruídos.
Enviar
Janela de vídeos
Felipe Cecagno (você)
Notas compartilhadas
18/47
100%
400%
© 2015 http://www.mconf.org
Portuguese (Brazilian)
Layout padrão

BigBlueButton Foundation

Nonprofit organization responsible for the source code and the brand of BigBlueButton

Funding for developer summits

Mconf Tecnologia is a member of the BigBlueButton Foundation

Summit VIII: Ottawa, Ontario (Apr/16)

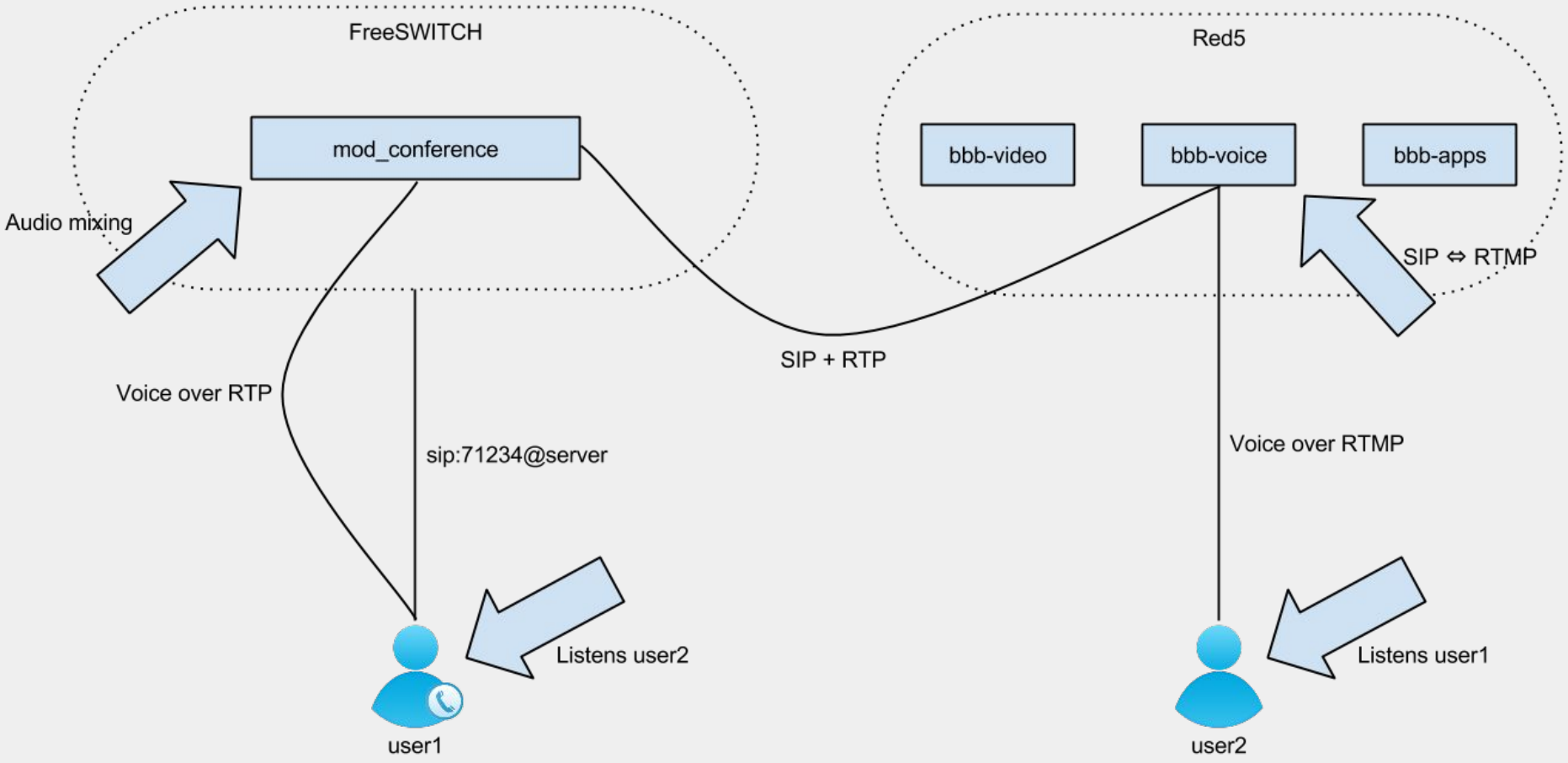
Mconf and WebRTC

Mconf-Live has a Flash-based client

WebRTC used for audio on Firefox and Chrome

Client-server architecture

Voice architecture



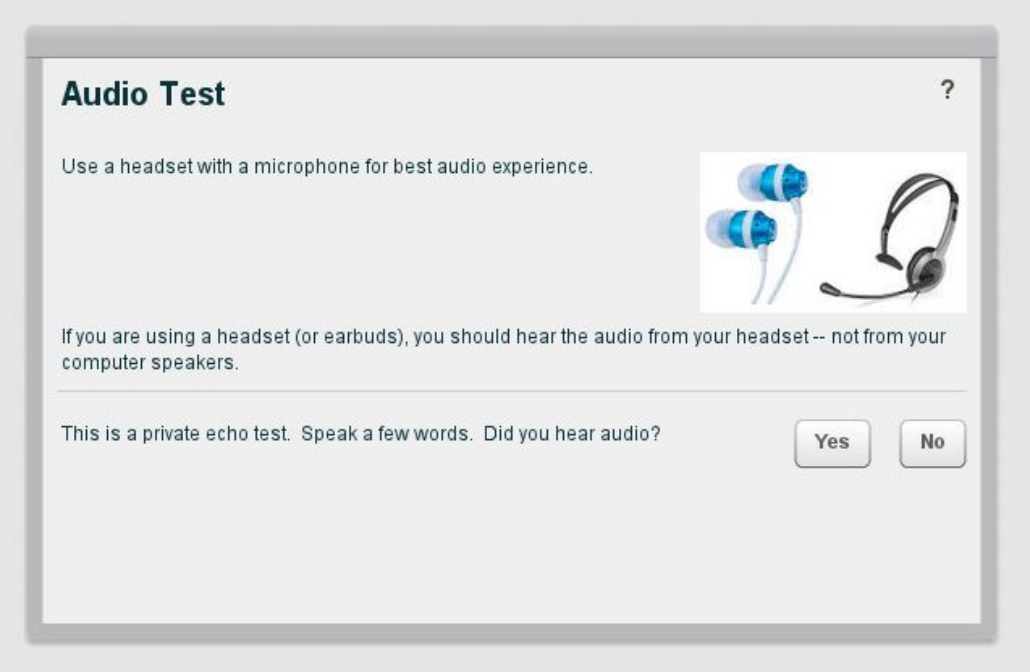
Voice architecture

sip.js connects to the (secure) websockets interface of FreeSWITCH, and communicates using SIP

TURN and STUN configured server-wide

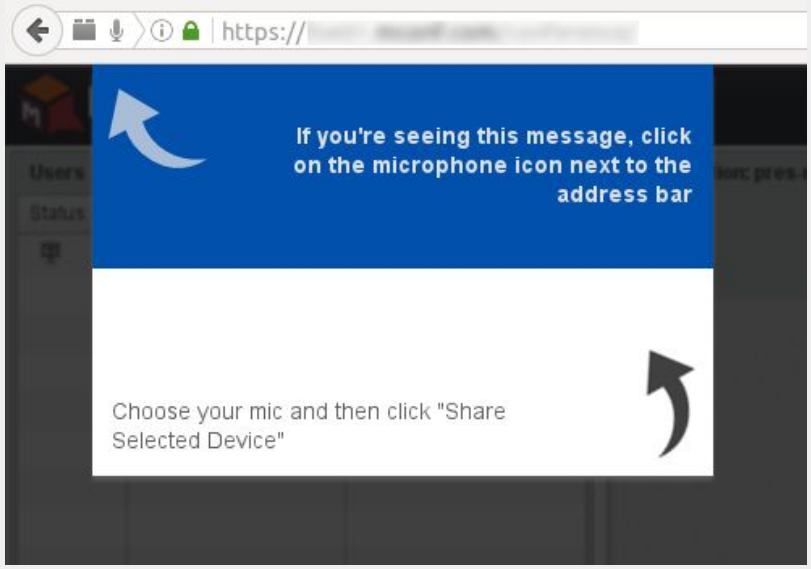
Voice architecture

Echo test and then transfer to the conference



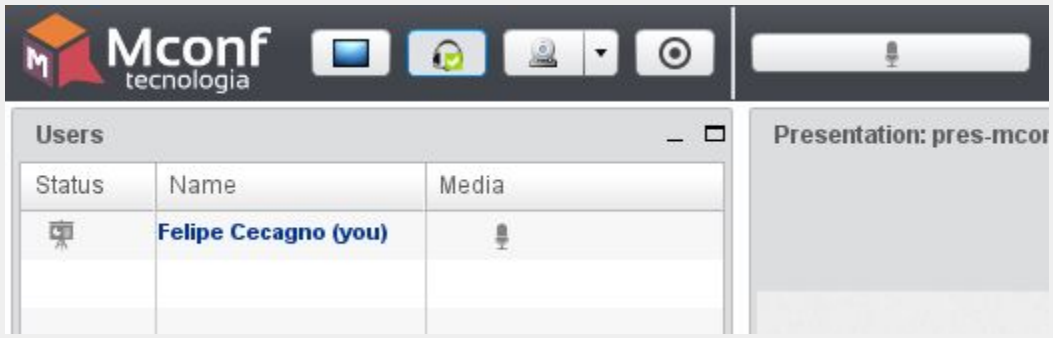
Voice architecture

Bridge between Flash and Javascript for coordination



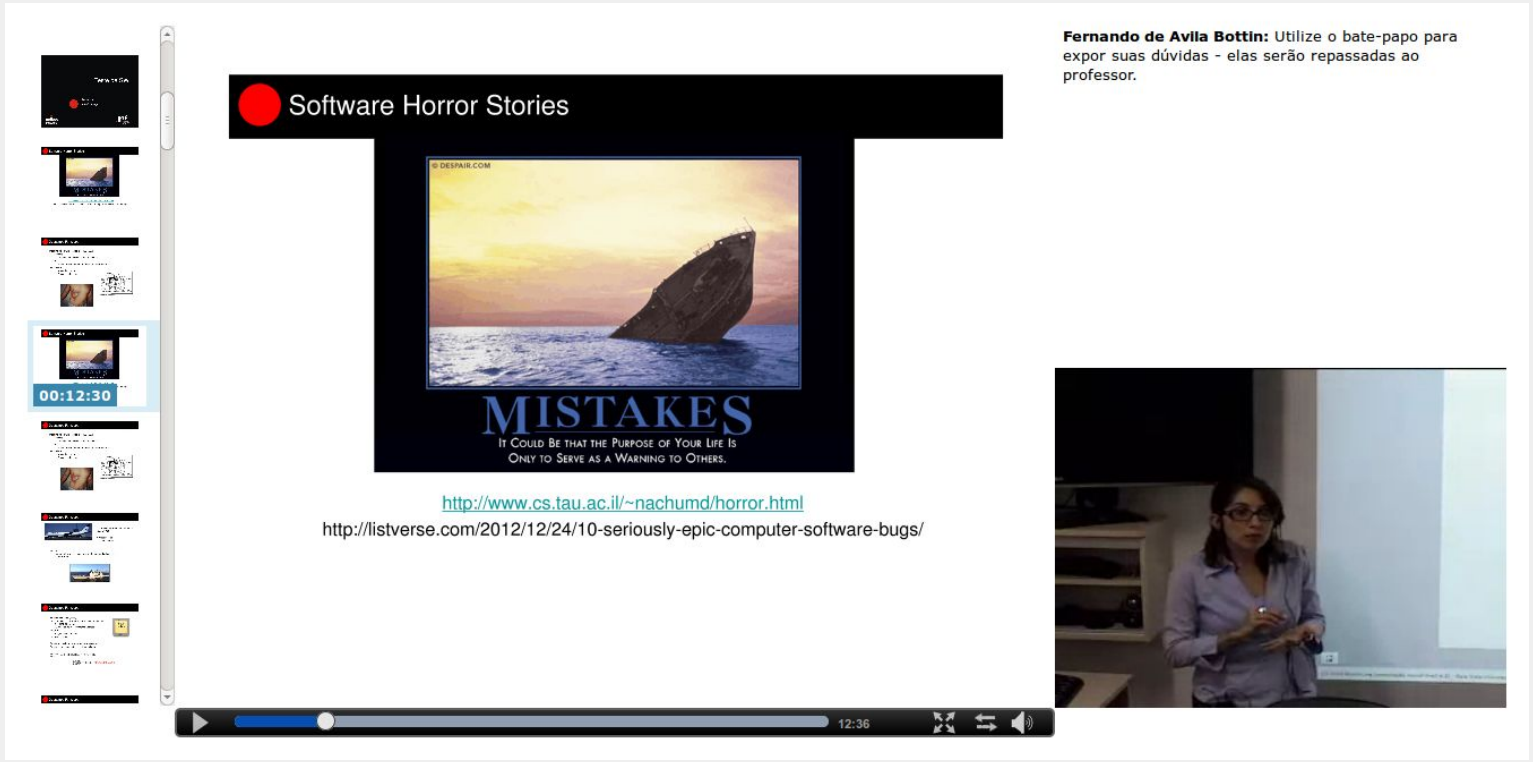
Voice architecture

After established the connection, signaling goes through FreeSWITCH Event Socket Library (mute, unmute, talking, …)



Recording

mod_conference records the raw audio, including WebRTC



WebRTC Stats

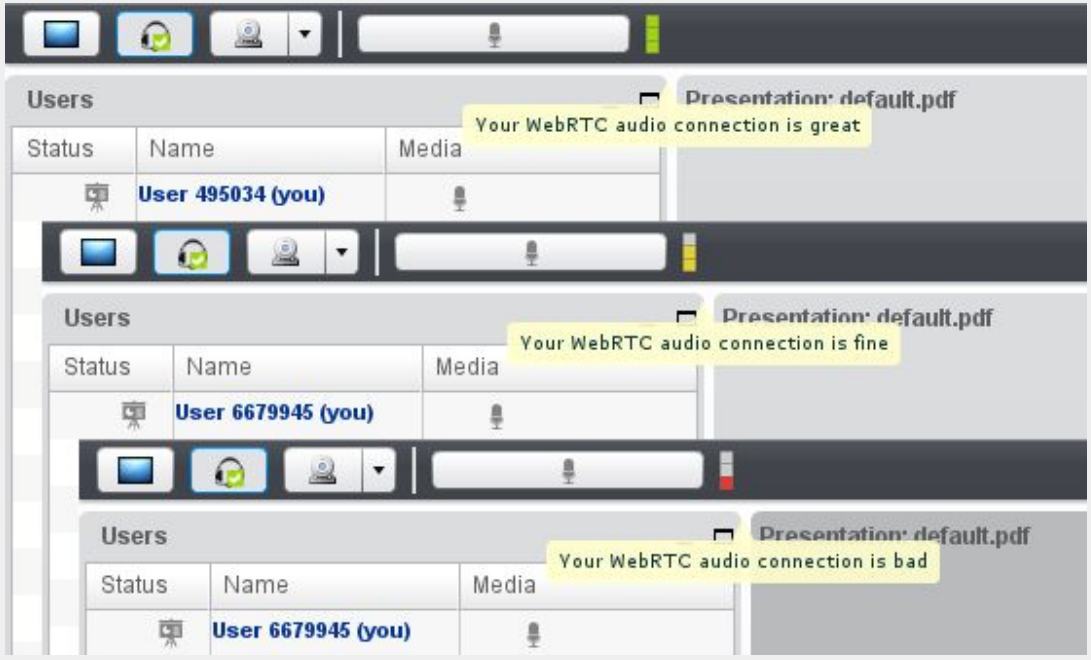
Different APIs on Chrome and Firefox

- Different level of detail

Chrome offers much more information

WebRTC Stats

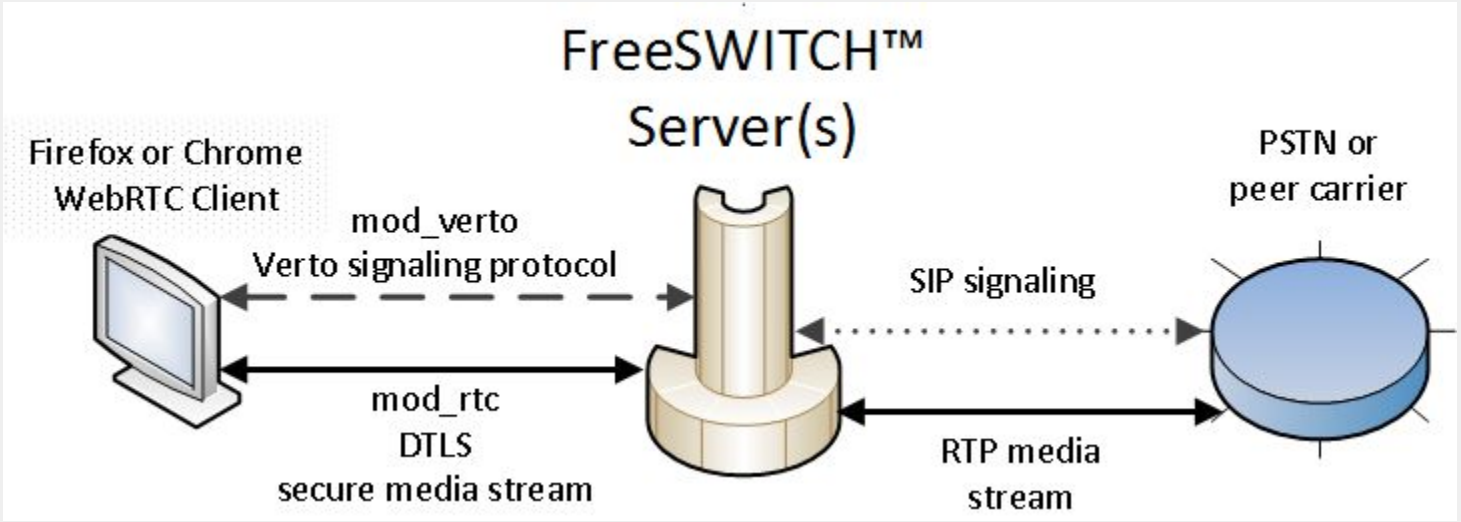
Using adapter.js (https://github.com/webrtc/adapter)



WebRTC Desktop Sharing

Being developed by Blindside Networks

Fallback to Java Web Start desktop sharing



Challenges

HTTPS and getUserMedia on Chrome

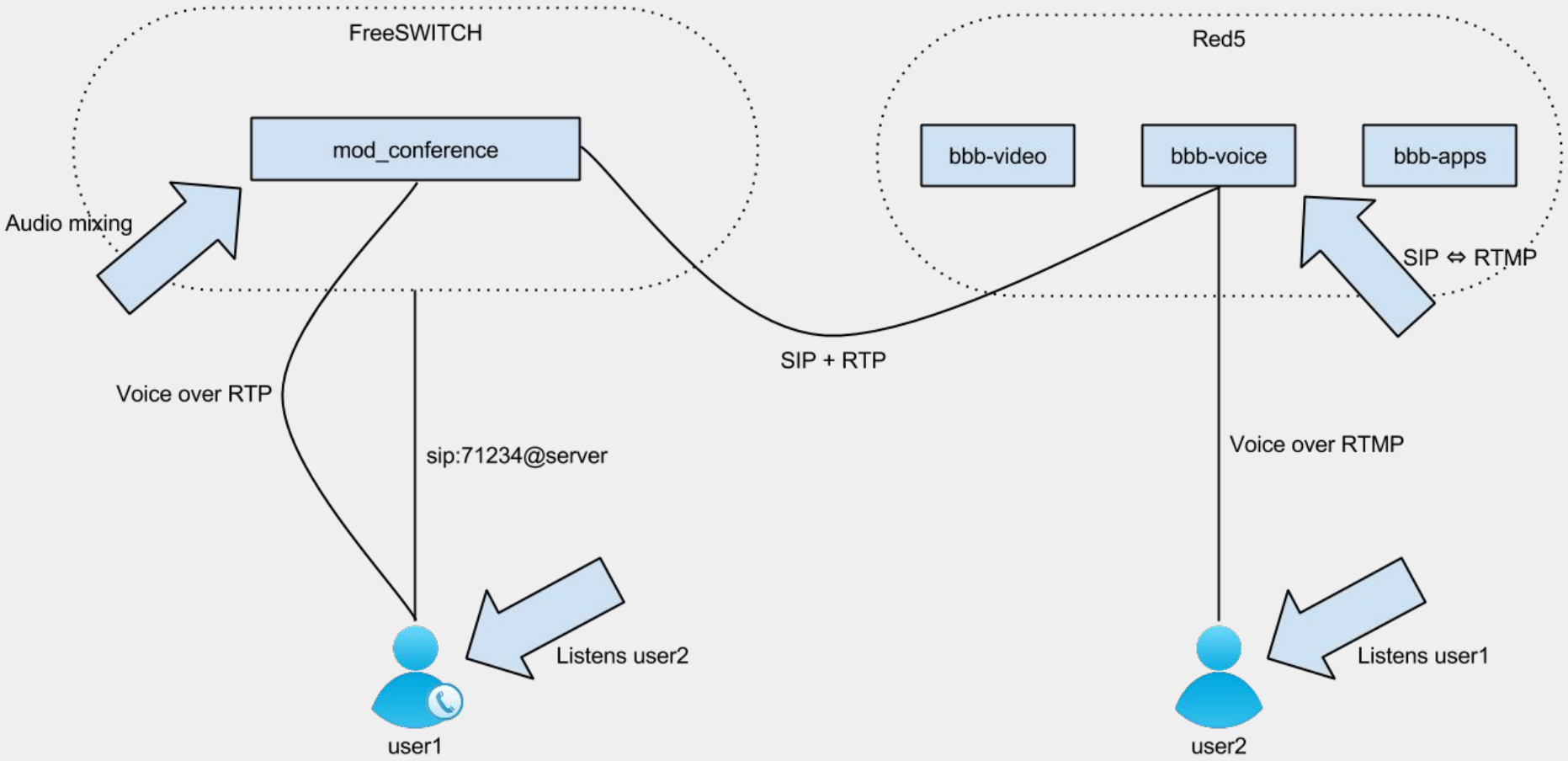
Let’s encrypt! https://letsencrypt.org/

Challenges

Listen only mode with WebRTC

Challenges

Listen only mode with WebRTC



Challenges

Video !!

Flash and HTML5

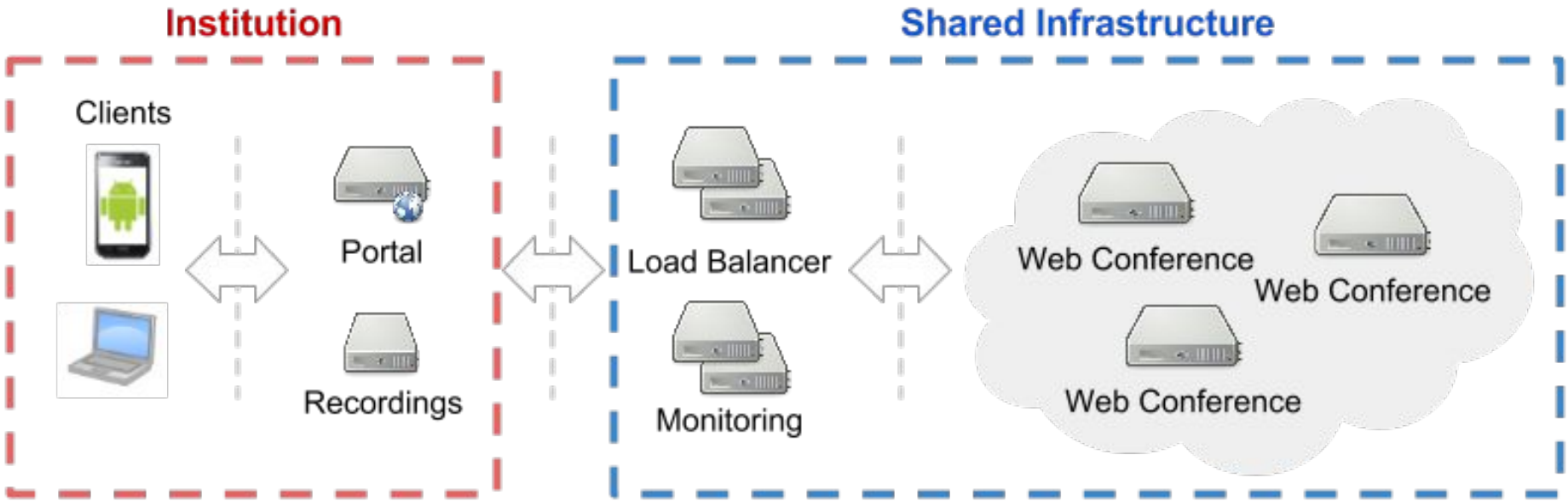
Bridge between FreeSWITCH and Red5

Mconf Academic Network

- Proposed in 2012 at Terena Conference
- Collaborative web conferencing network for academic institutions
- Shared pool of web conferencing servers

Mconf Academic Network

Simplified architecture:

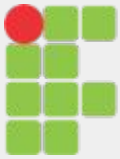


Mconf Academic Network

- Main advantages:
  - High availability
  - Optimization of resources
  - Low setup and maintenance cost
  - Monitored environment
  - Detailed statistics and usage reports
  - Institutions manage their own users, their permissions and their data (including recordings)
  - Global collaborative open source development

Mconf Academic Network

- 14 partners in 8 countries
- 31 Mconf-Live servers
- 10 Recording servers



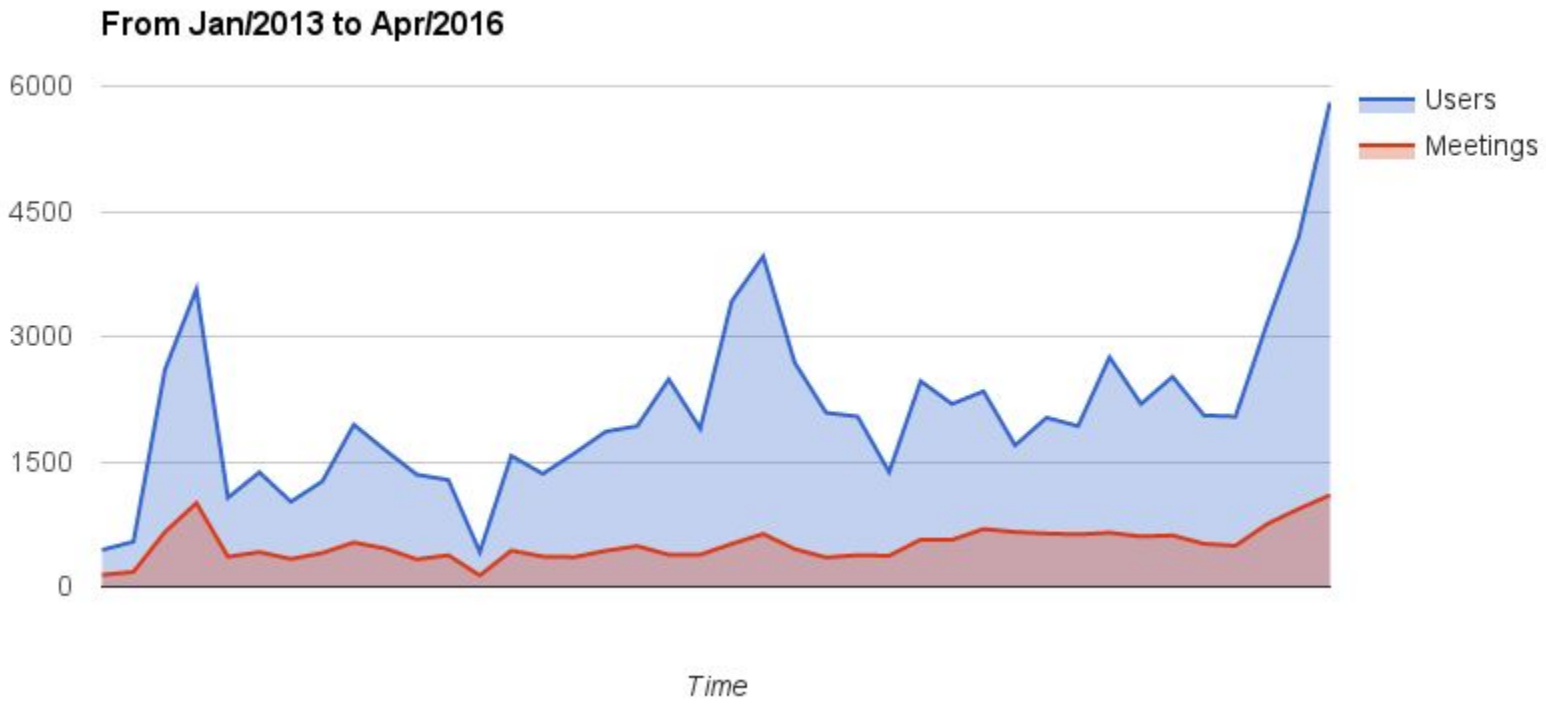
INSTITUTO FEDERAL
RIO GRANDE DO SUL

Mconf Academic Network

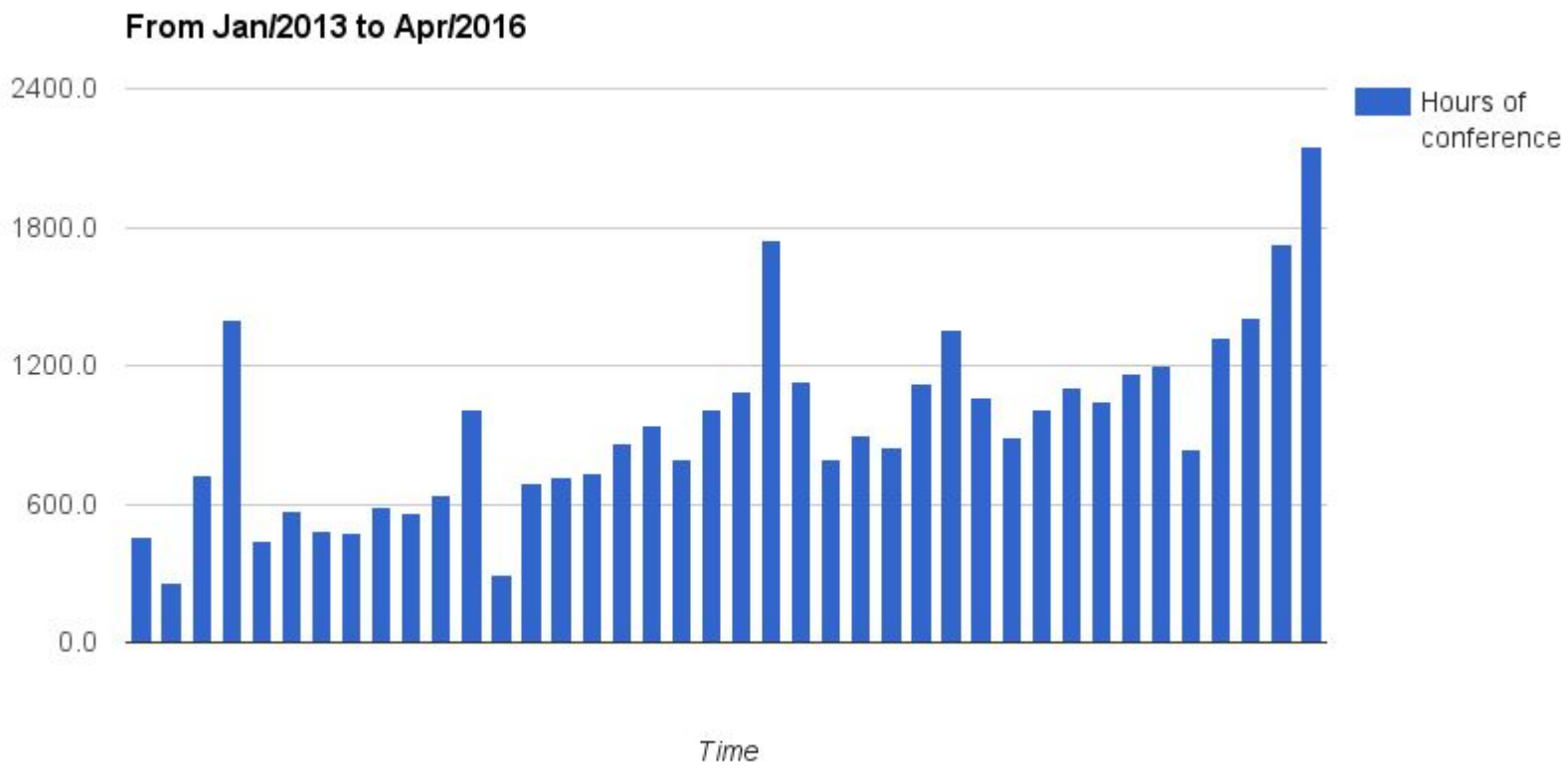
Mconf Academic Network

- Currently managed by Mconf Tecnologia
- Ongoing discussions on creating a nonprofit organization

Mconf Academic Network



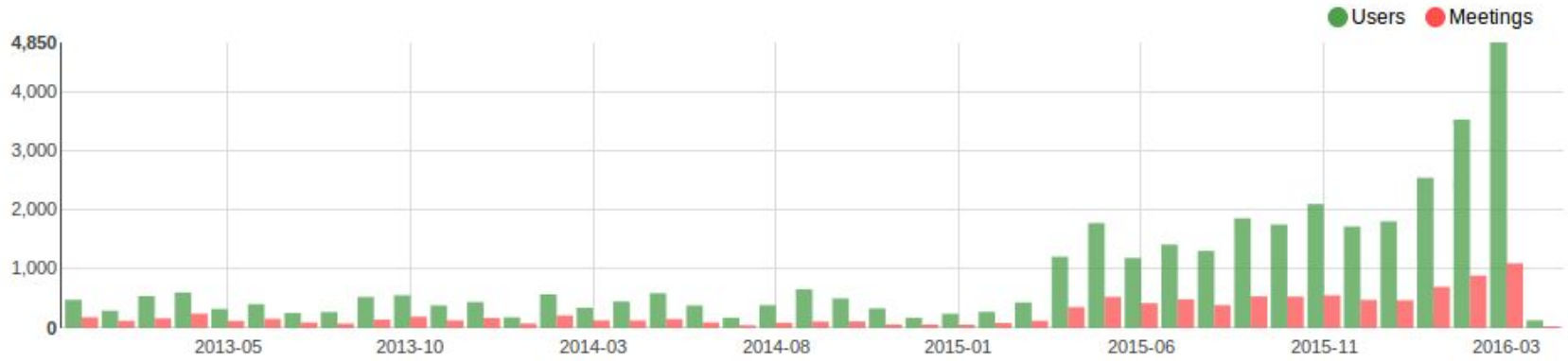
Mconf Academic Network



Mconf Academic Network

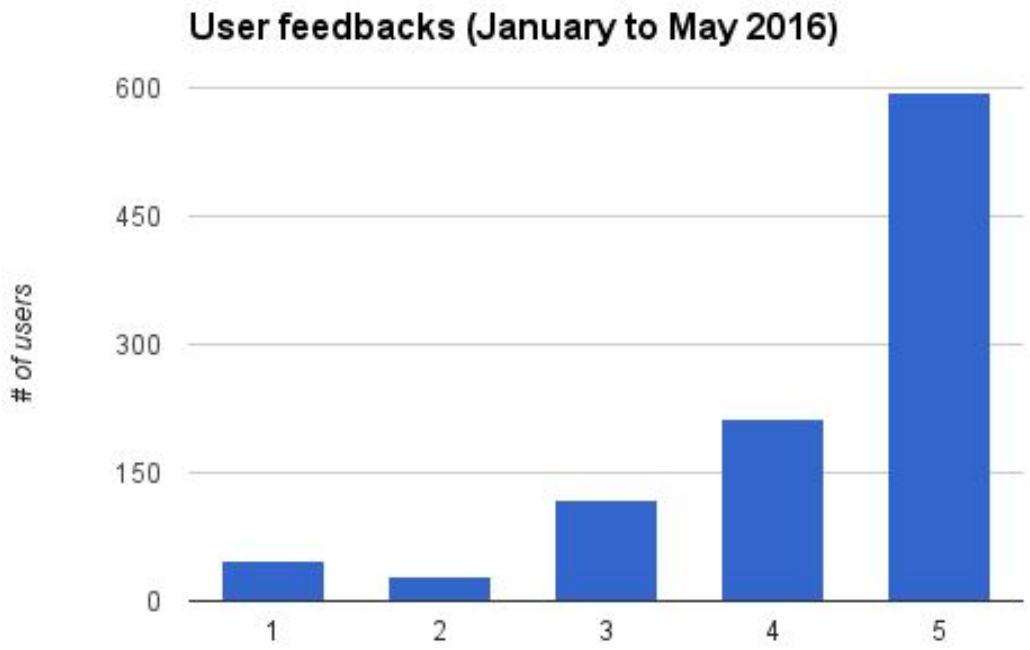
Usage report from 2013-01-01 to 2016-05-03

Number of users and meetings in the selected period (Monthly sampling)



Number of meetings	10792
Number of users	46961
Average meeting duration	127.18 minutes
Maximum number of simultaneous meetings	81
Average number of users	4.3515
Maximum number of simultaneous users	250
Number of recordings	1595
Average recording duration	88.214 minutes

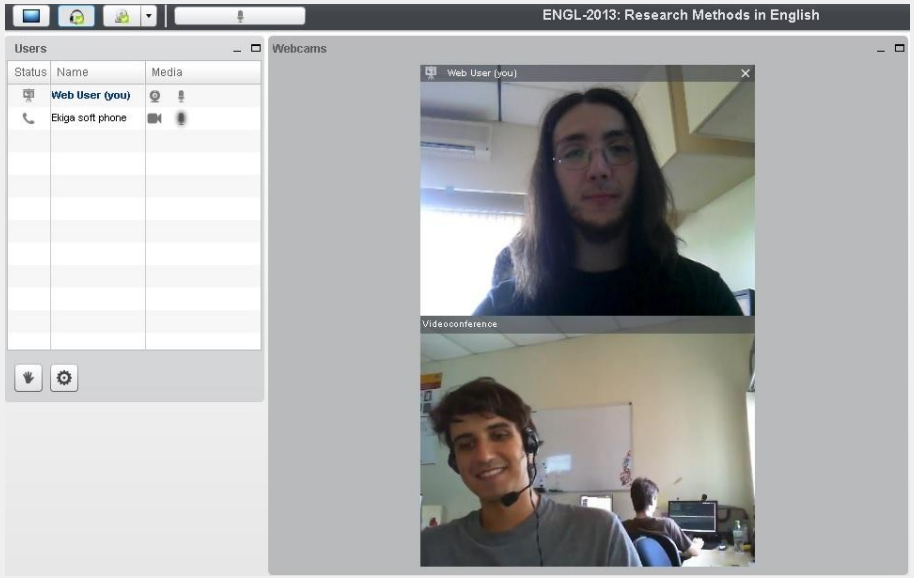
User feedback

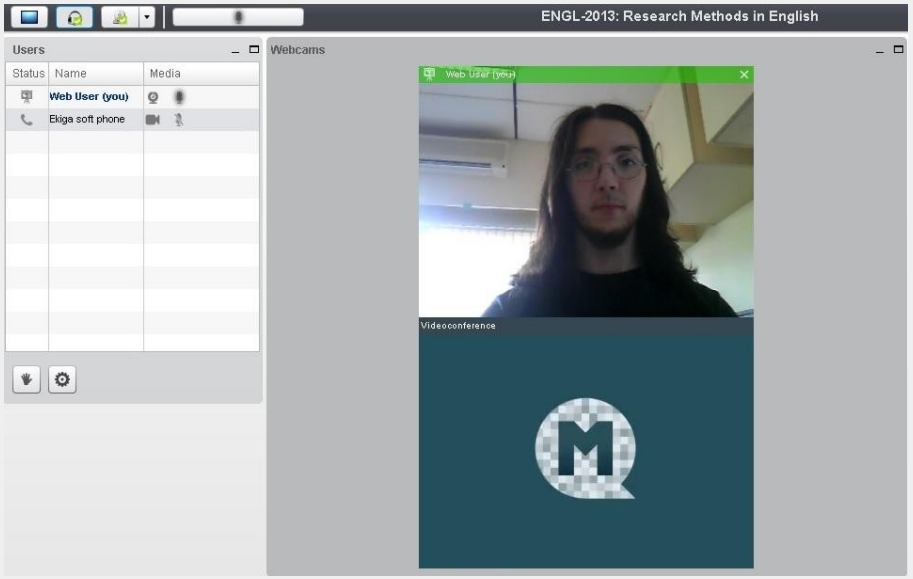


- Most common problems:
  - Environment (microphone and camera setup)
  - Network connection

Roadmap

- Interoperability with videoconference systems, such as Cisco and Polycom, through SIP



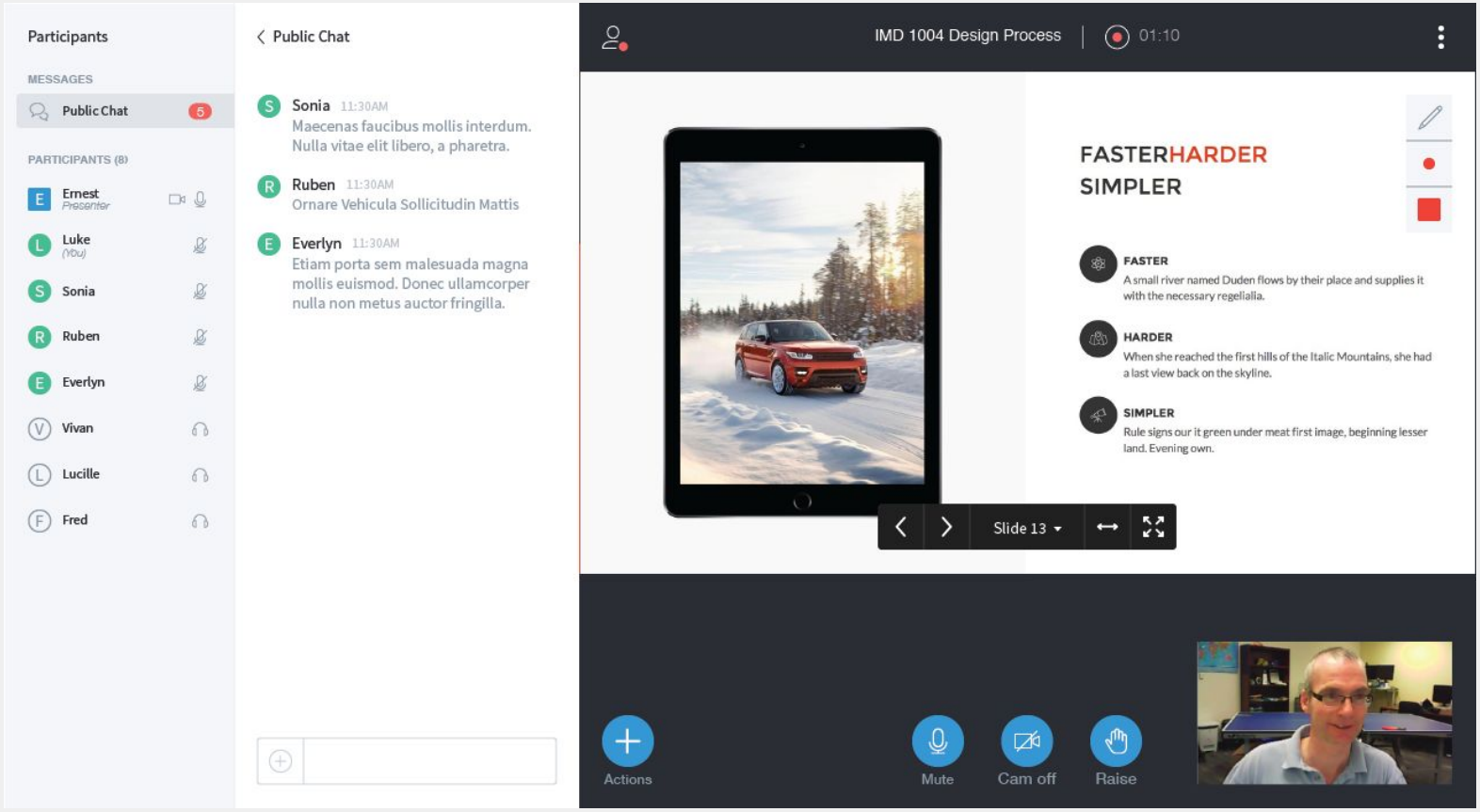


Roadmap

- Outbound calls

Roadmap

- ❏ HTML5 client (unified UI)



Roadmap

- ❏ High performance desktop sharing
- ❏ Improvements on the mobile integration

BigBlueButton Summit VIII

- Project update
  https://youtu.be/D6V05LazLhE
- UI update
  https://youtu.be/AZgZV1bN0sU
- HTML5 client update
  https://youtu.be/46Es4c24QSg

Development team

- ~15 developers at our research group and company

Services by Mconf Tecnologia

Hosting (webconferencing as a service)

Tier 2 support

Customization and deployment

Software development

Final remarks

Many opportunities for collaboration:

- ❏ Testing and reporting issues
- ❏ Creating documentation
- ❏ Developing
- ❏ Funding improvements
- ❏ Joining the BigBlueButton Foundation
  - ❏ Developer Summit in Europe? ☺

Thank you!

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