

eduMEET - easy, secure and cost effective VC

TF-EDU virtual meeting
12.05.2020

***WebRTC video-conferencing
service for research,
educational and art societies***

WebRTC

- web-based RTC technology
- set of communications protocols and application programming interfaces
- enables real-time communication over peer-to-peer connections
- browsers can request real-time information from browsers of other users
- applications: video conferencing, file transfer, chat, or desktop sharing without the need of either internal or external plugins

Supported Browsers & Platforms

Chrome



Firefox



Opera



Android



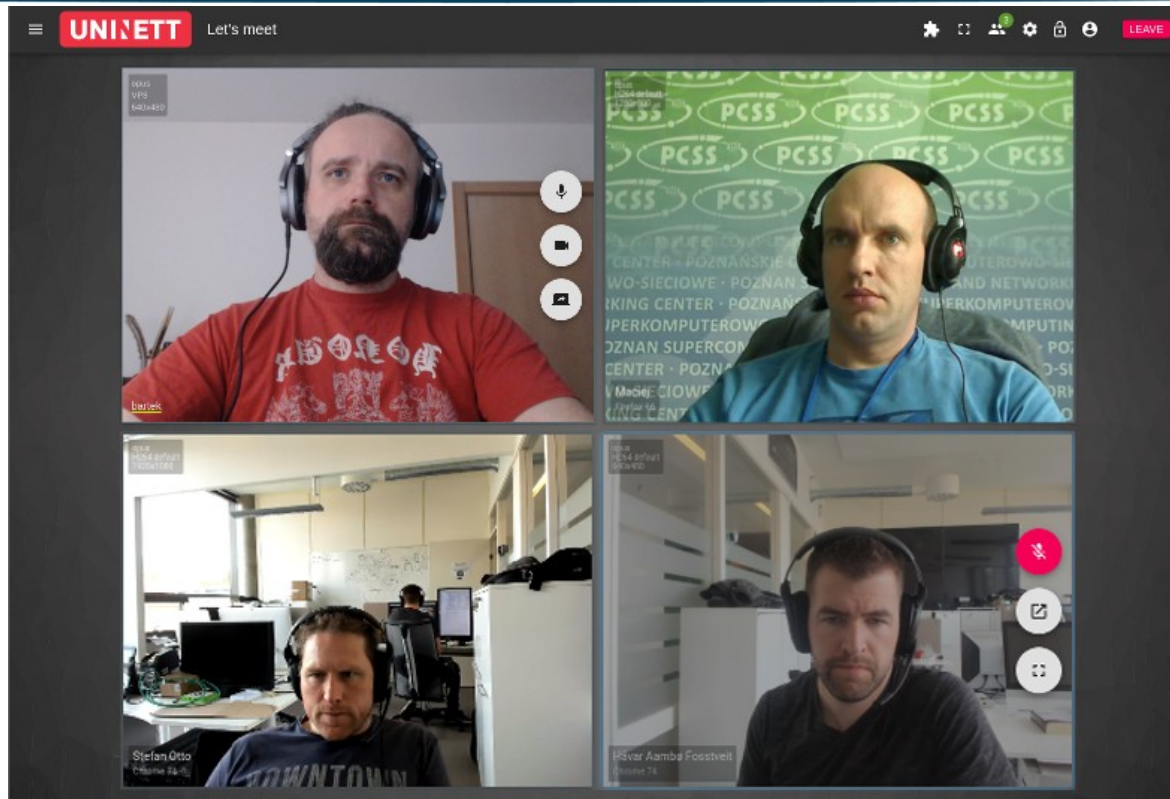
iOS



Design assumptions

- introduce to NRENs a **complete, alternate service** to commercial solutions,
- develop technical **infrastructure** and **components** for open WebRTC services,
- provide common, open-source **service** for research, educational and art societies,
- simplify real-time communication and introduce **web browsers based tools**

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Service overview

- open WebRTC-based VC client
- runs in a web browser (including mobile devices)
- no need to install clients or plugins
- complete VC platform for educational, research and art communities
- VC service support infrastructure – backend
- scalability – media nodes can work together to serve frontends
- 18 languages

Functional features

- WebRTC audio/video communication
- screen sharing, file sharing and chat feature
- federated login, including eduGAIN and eduTEAMS
- speaker detection (microphone analyser with visual indicator)
- audio and video streams management
- additional video stream (2nd camera)

Functional features

- full-screen mode, raise hand option, connection testing
- customizable view layout (democratic and filmstrip)
- high resolution support (tested up to 4K)
- removing participants (moderator and admin roles)
- muting audio / video for other participants
- pop-up window with stream from one of participants
- soon: recording, streaming, white-board, legacy VC, PSTN



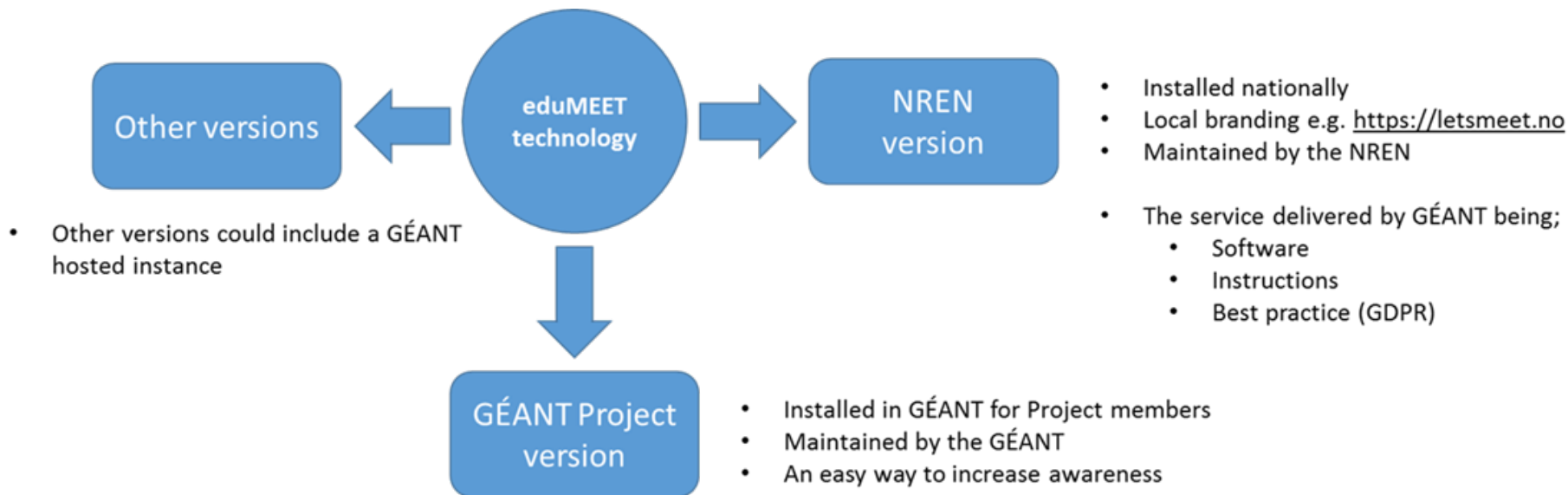
Distinguishing features

- Own, open source software – by and for our communities!
- Secure communication
- Trust - on level of similar organizations
- Trustworthy - Keeping the AV traffic inside our network (GEANT + NRENS) as long as possible
- Low cost compared with commercial solutions
- WebRTC standards based and easy to use
- No need for installation of custom applications or plug-ins

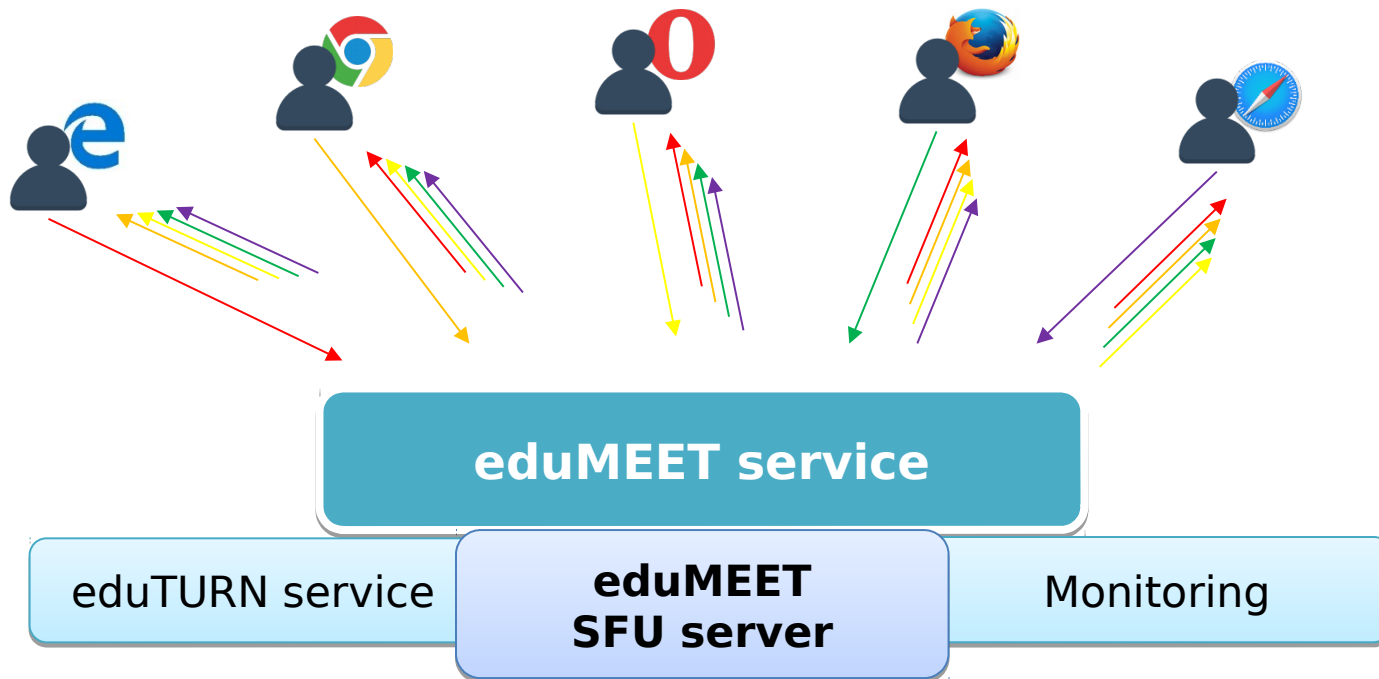
Educational aspects

- LMS integrations (LTI), Moodle interest (pending discussions)
- affiliation of the teacher - different roles (staff, moderator)
- lock the room only by teacher (moderator) possible
- raise hand
- press space bar to talk / auto unmute
- mics controlled by teacher + mute on join
- support and community channels for help
- and... easy and direct contact for another needed features!

Service instance types



Architecture example



eduTURN - co-turn bases service

- pilot implementation of federated, distributed STUN/TURN infrastructure
- co-turn: open source implementation of TURN
- overcoming NAT, packet filters and firewall obstacles
- keeping traffic inside the GÉANT and NRENs' networks
- usability of software and nodes: not limited to VC services
- current nodes: located in 10 countries, 2 other locations are pending

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Monitoring, statistics and testing

- another set of services supporting eduMEET
- central instance of Munin for monitoring purposes
- engines for gathering anonymised statistics from browsers
- testing infrastructure based on the Selenium platform, to automate test procedures with headless browsers

Roadmap

Delivered (just shipped)	Coming soon Near term (mid 2020)	Big picture Medium term (end 2020 - mid 2021)
SFU based version	Hybrid version (SFU based with peer-to-peer)	Continue integration with legacy VC systems
Peer-to-peer version	Local recording feature	Advanced audio mixing
Full set of basic VC functionalities	Streaming / webinars	Mesh of servers (communication between different servers to support very big meetings)
STUN / TURN integration	Standardization processes: <ul style="list-style-type: none"> • active participation (W3C) • keep software up to date 	Standardization processes: <ul style="list-style-type: none"> • active participation (W3C) • keep software up to date
Federated login	Claim and manage room	Integrations in LMS (LTI)
Lobby	Localization / translation	Whiteboard
Session management	Expanded error handling + sessions restore (in case of crash)	Investigate new research and technical areas (as 8K, 360deg., 3D, VR, AR, face recognition, gestures)
	Private tracker for file sharing	

Potential scopes of collaboration:

- common scenarios
- common infrastructure
- share your needs and ideas
- meetings and conferences support

We will support your VC nodes in a long term!

- we do understand EDU society!
- we are GÉANT compatible!
- we understand AAI (eduGAIN, eduTEAMS)!
- we do listen to our society (direct contact for your specific needs).

Requirements to start own service:

- **1 VM for VC service**
- **[2 VM for eduTURN service]**

Size	vCPU	Memory: GiB	Temp storage (SSD) GiB	Max data disks	Max cached and temp storage throughput: IOPS / MBps (cache size in GiB)	Max uncached disk throughput: IOPS / MBps	Max NICs / Expected network bandwidth (Mbps)
Standard_D2s_v3	2	8	16	4	4000 / 32 (50)	3200 / 48	2 / 1000

- **Bandwidth!** (1-4Mb/s per participant)

We will support your VC nodes in a long term!

5 NRENs directly involved in current development and pilot phase:



Kormányzati
Informatikai
Fejlesztési
Ügynökség



Nemzeti Információs
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CARNET



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