

Vers un environnement collaboratif multi-utilisateurs

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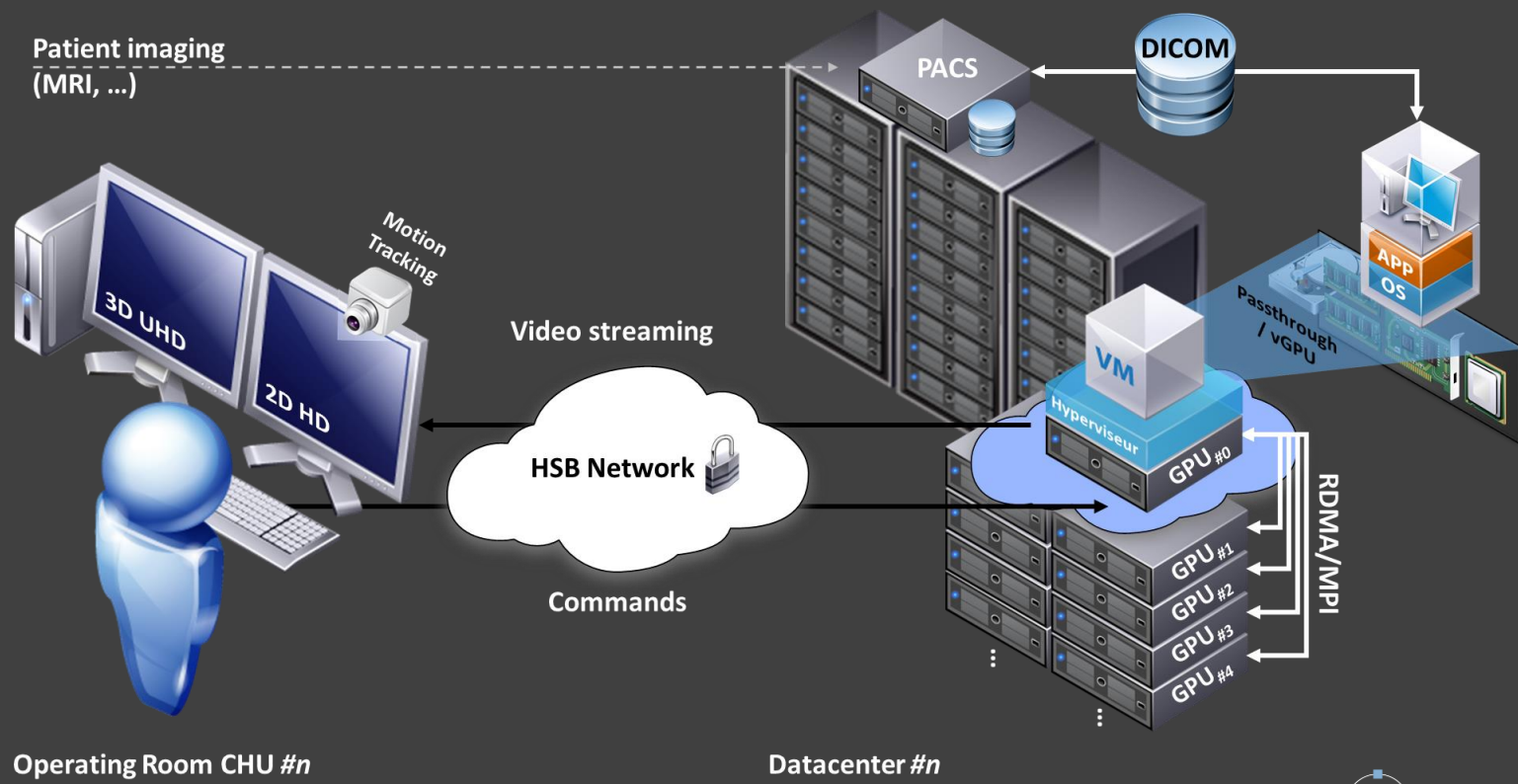
Overview



- Context & background
- USE Together in action
 - WebRTC
 - USE Together architecture
- Use cases
 - Manufacturing industries (Scientific Visualization – VolViz, InfoViz)
 - E-health and Biotechnologies (Scientific Visualization – VolViz, InfoViz)
 - E-learning
- Demo – USE Together in live
- Conclusion and future work

Context

Support projects



Middleware developed and used in projects ICOS (FUI) and 3DNS (PIA2)

Joint initiative between OPEXMedia and URCA



Background

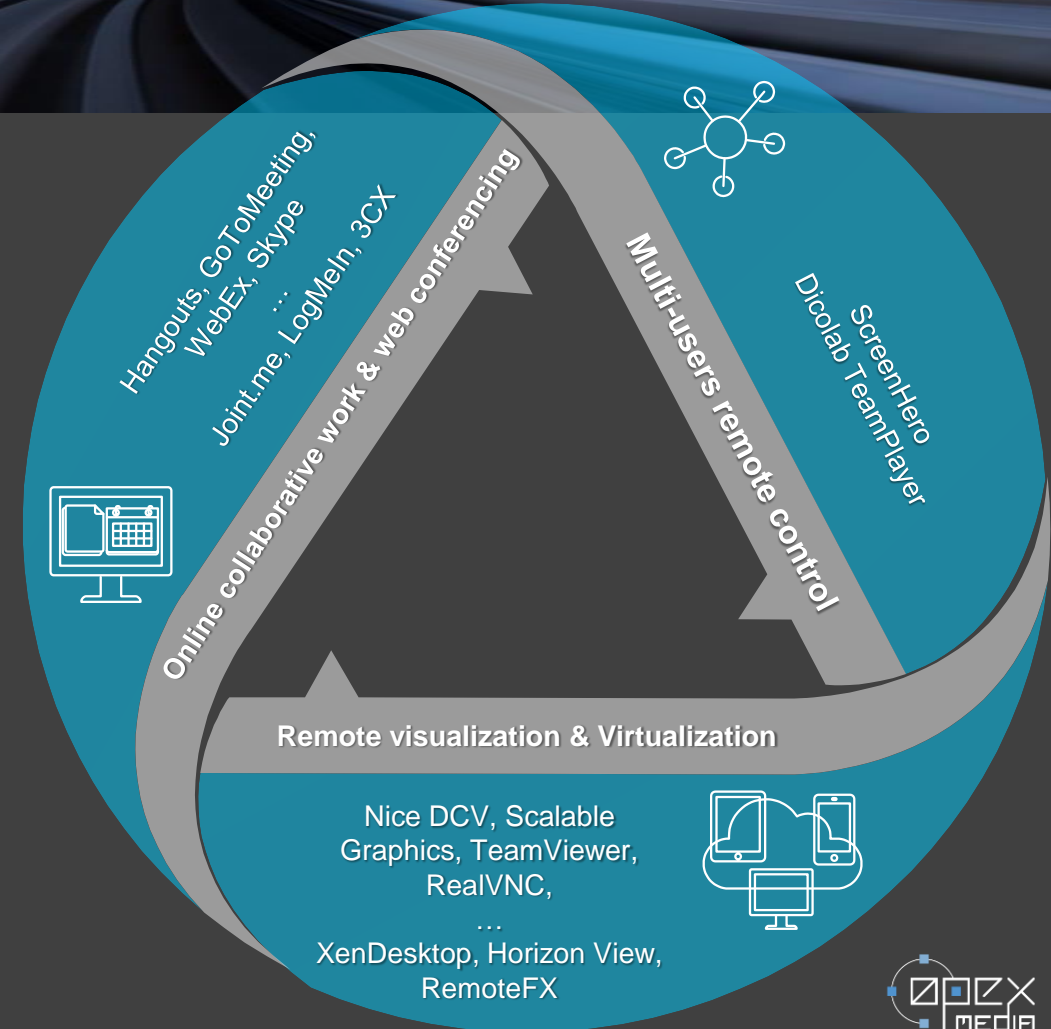
Trends and challenges



USE Together is motivated by several recent and increasingly important trends in HPC (ressources virtualization, [10]), remote visualization [4, 15, 21] and collaborative environments [5, 7, 9].

This paradigm of the « desktop of the future » [15] find several application in:

- Health [8]
- Collaborative visualization [5, 7, 9]
- Learning [13, 19] through whiteboarding collaboration [14, 17, 20]
- ...



Contribution

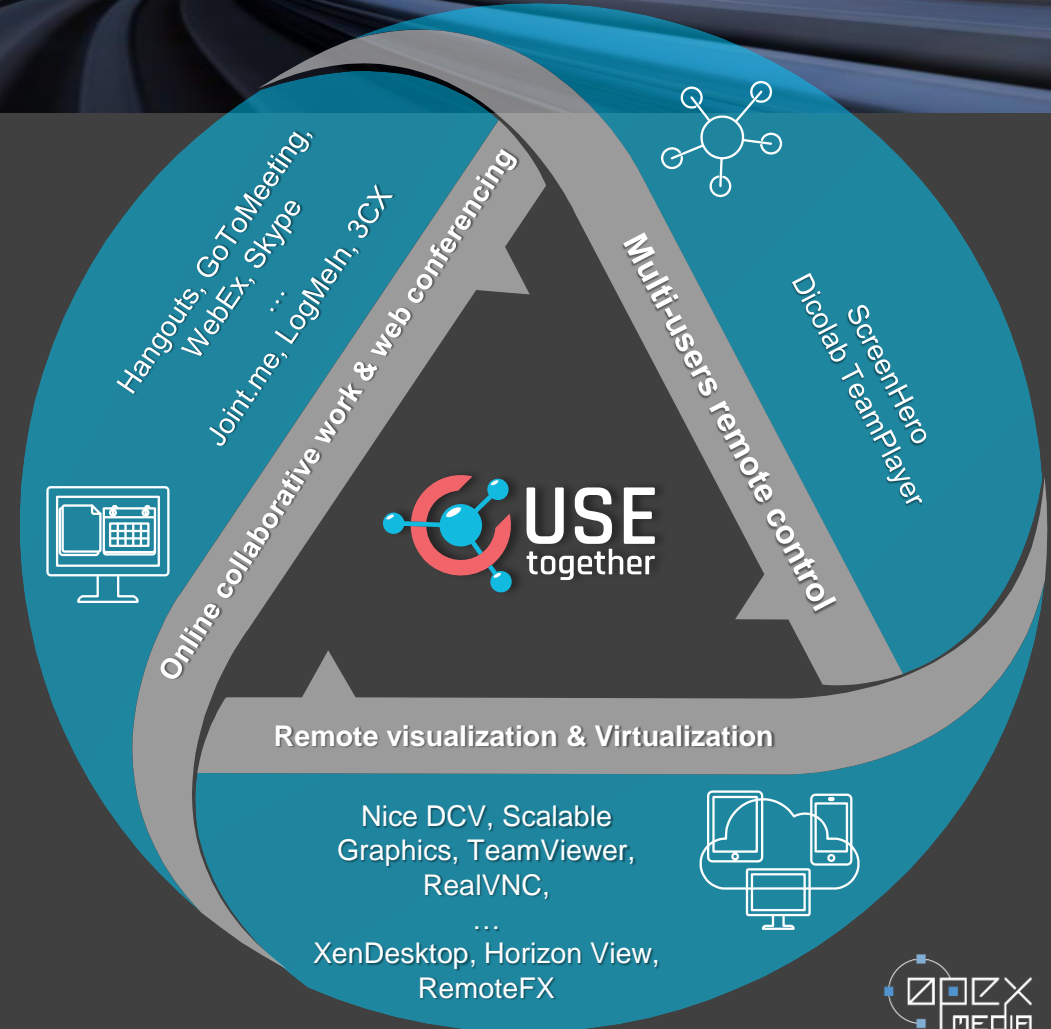
In a nutshell



Enhance your communications by sharing all your applications

USE Together is a secure multi-user collaborative system allowing professionals to share their applications and data in real time, accessible from any device, over any network.

- User QoE: HD in real time with low latency
- Collaborative: *video, audio* and chat
- Multi-devices: on workstation, laptop, tablet or mobile
- Zero-client deployment: based on standards such as WebRTC, HTML5
- Security: no data transmission only pixel, P2P architecture with encrypted streams
- Flexibility of use: SaaS, on-premise, host-to-host



WebRTC

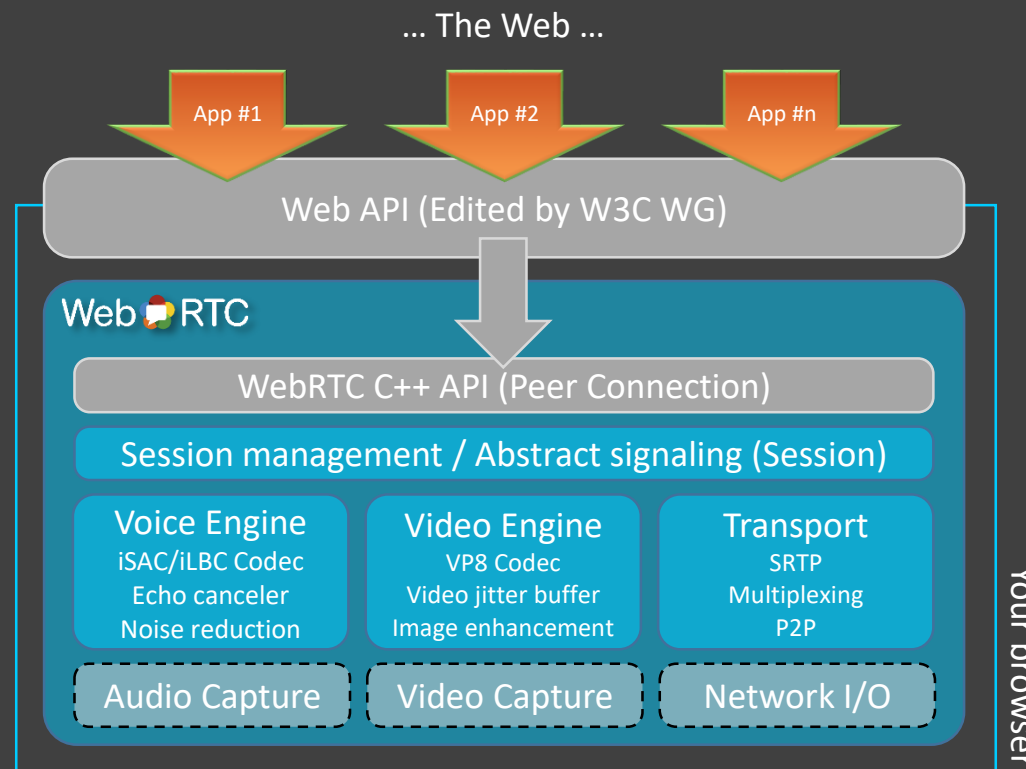
Bringing real-time communications to the Web



Web Real-Time Communication (WebRTC) is a collection of standards, protocols, and APIs, the combination of which enables peer-to-peer audio, video, and data sharing between browsers (peers).

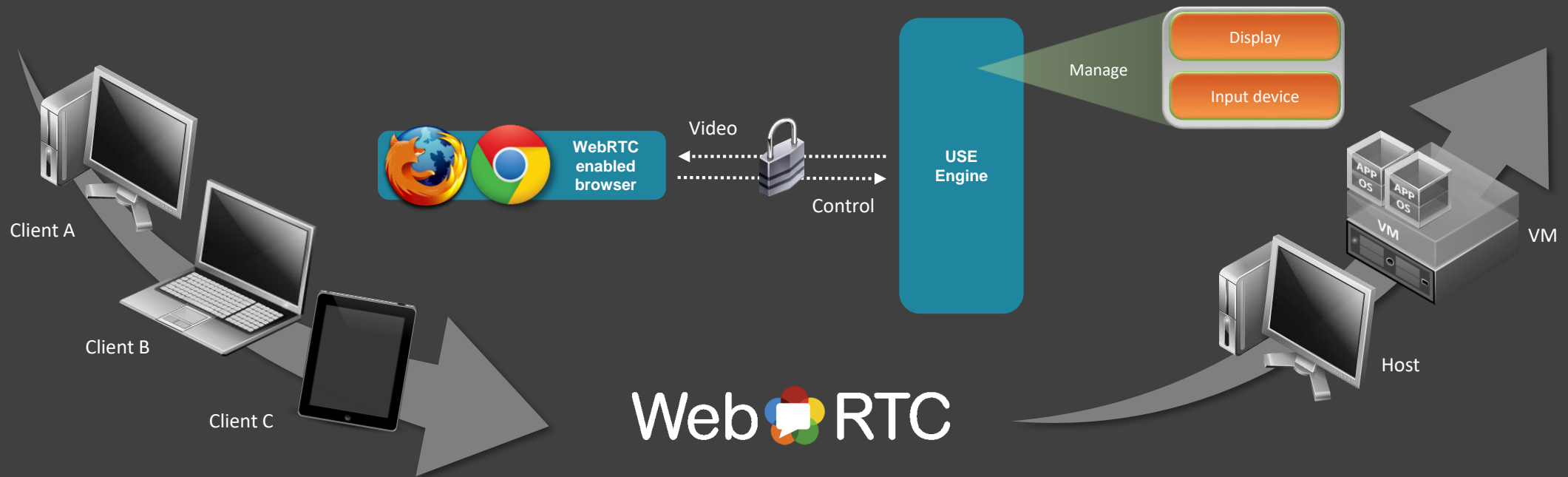
Three main tasks (APIs):

- Acquiring audio and video (MediaStream)
- Communicating audio and video (RTCPeerConnection)
- Communicating arbitrary data (RTCDataChannel)



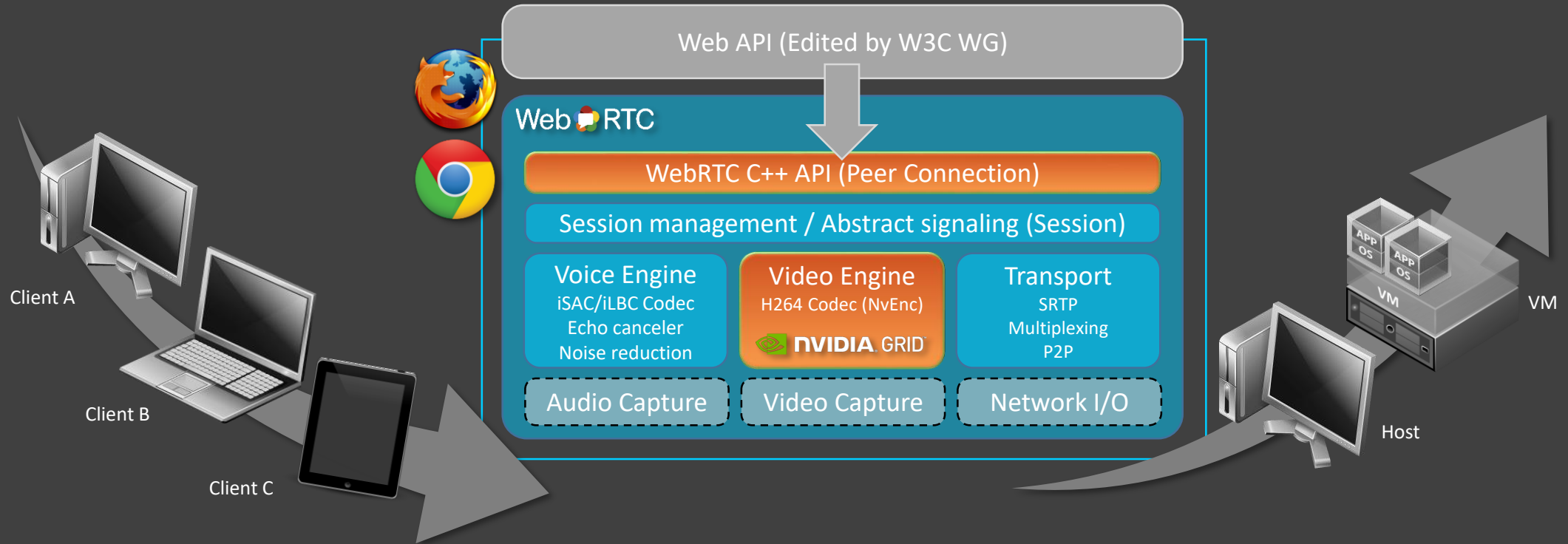
USE Together architecture

No plugins, one-click conference, VoIP/video interoperability



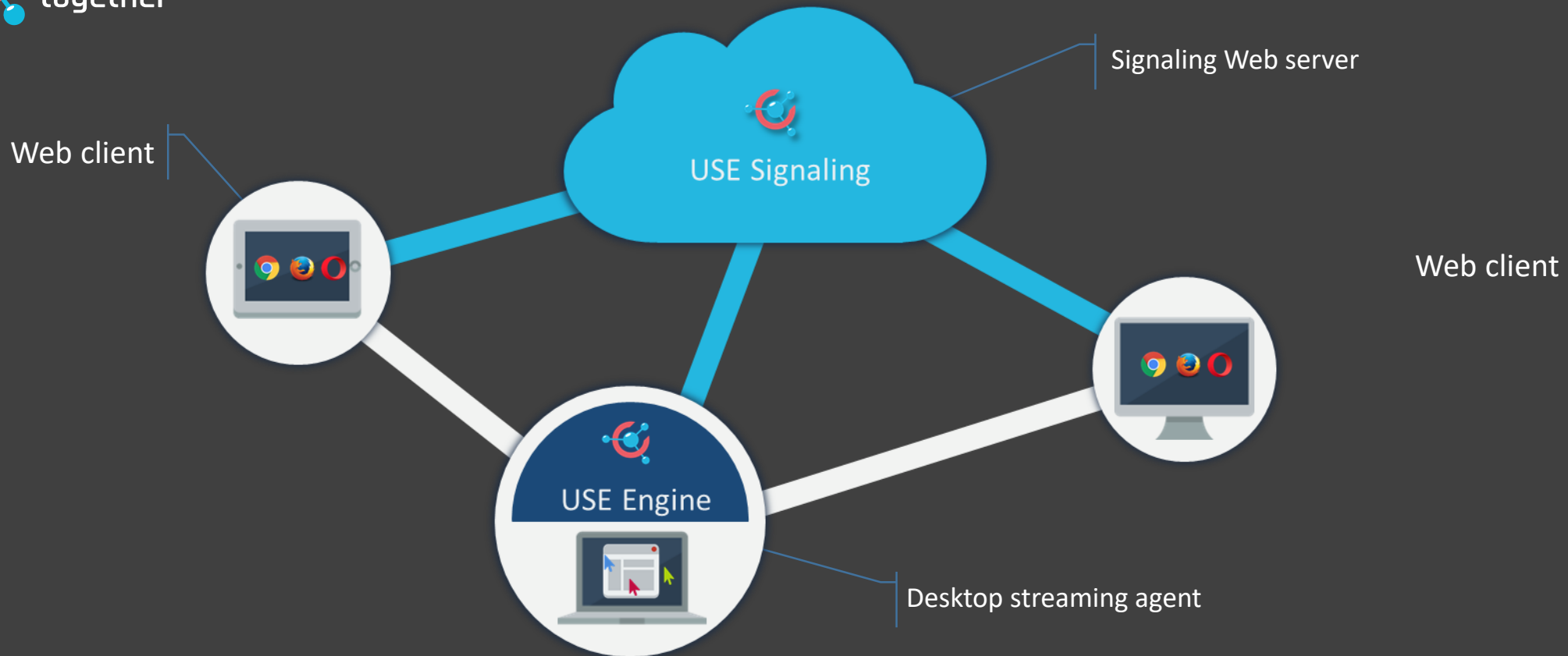
USE Together architecture

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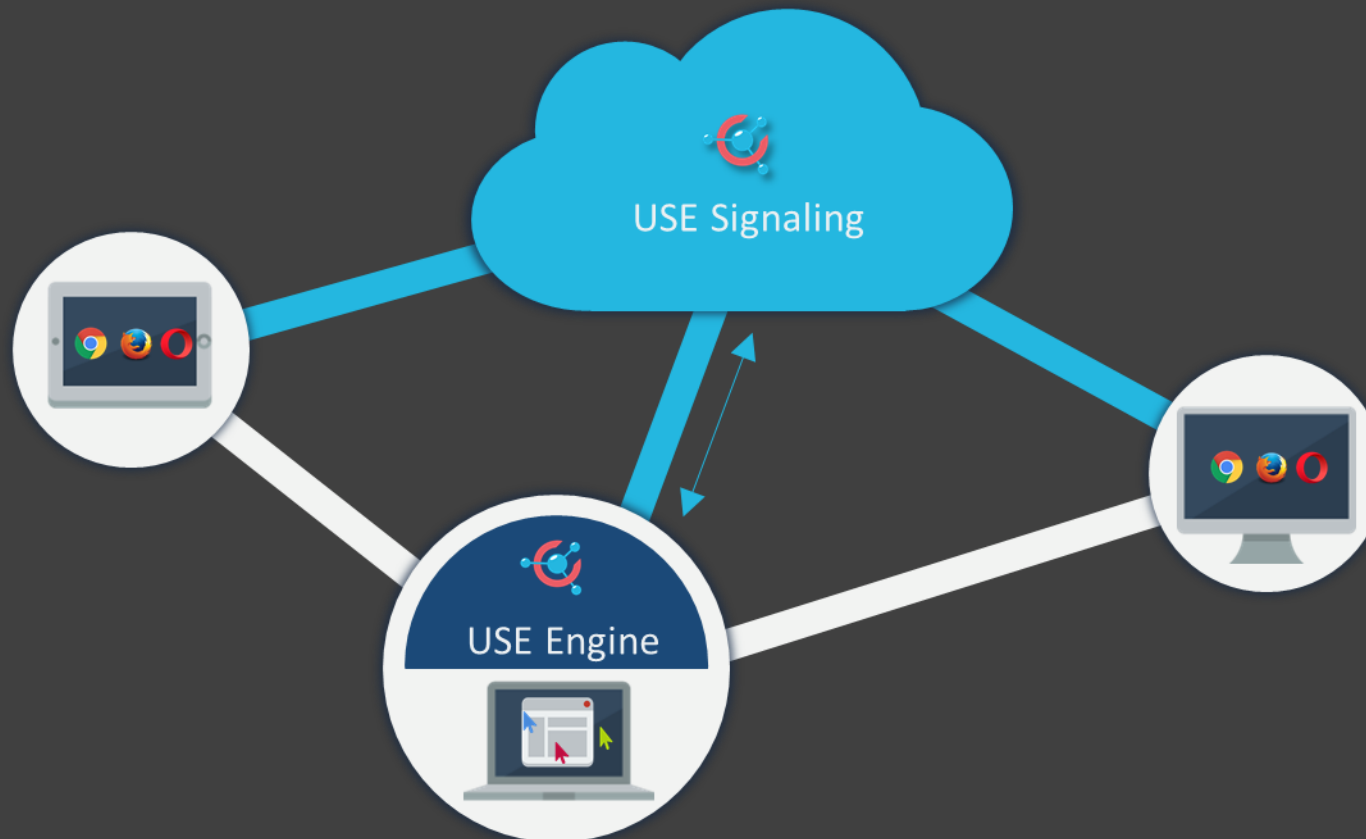
USE Together architecture

How does it work?



USE Together architecture

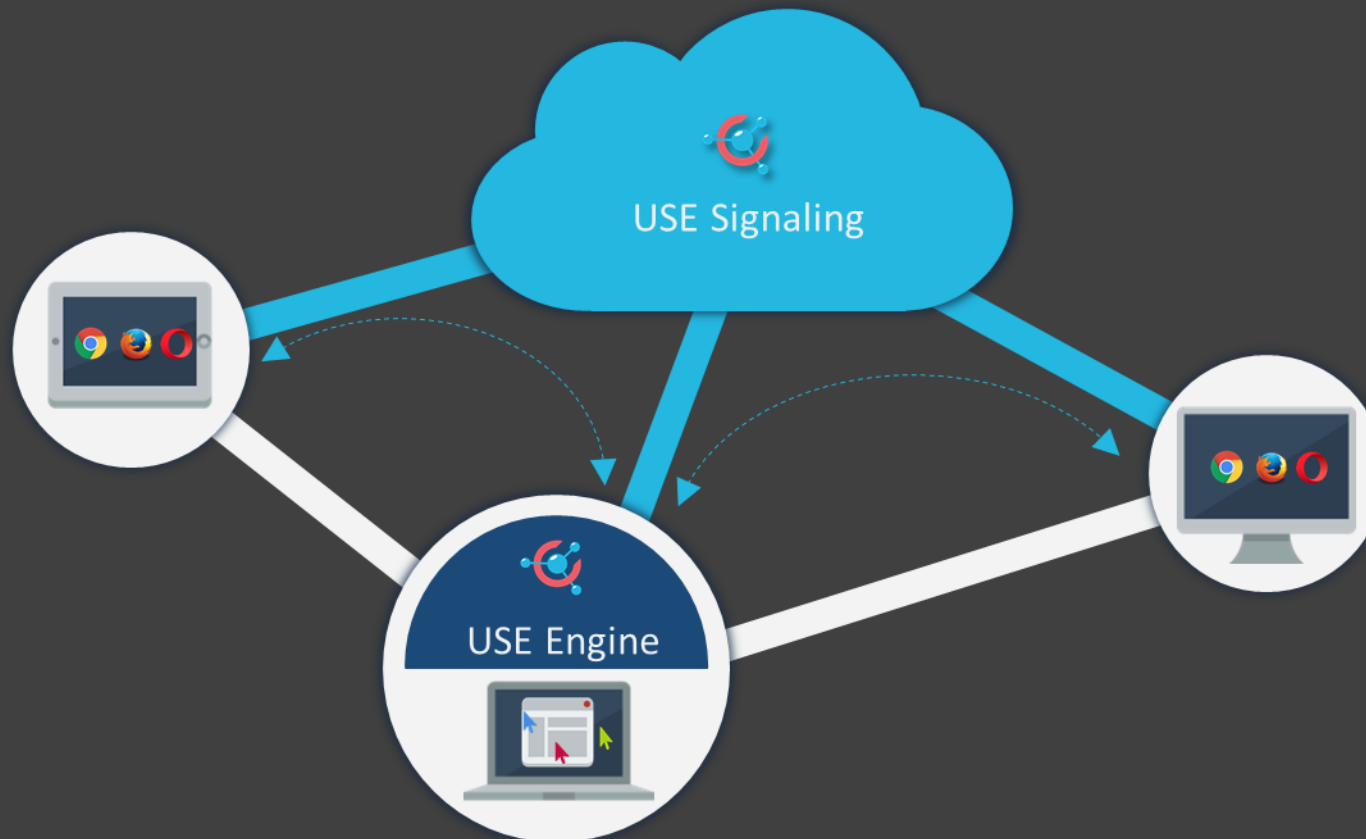
Room registration



Desktop streaming agent USE Engine registers a room on USE Signaling Web server so it can be easily reachable by Web clients

USE Together architecture

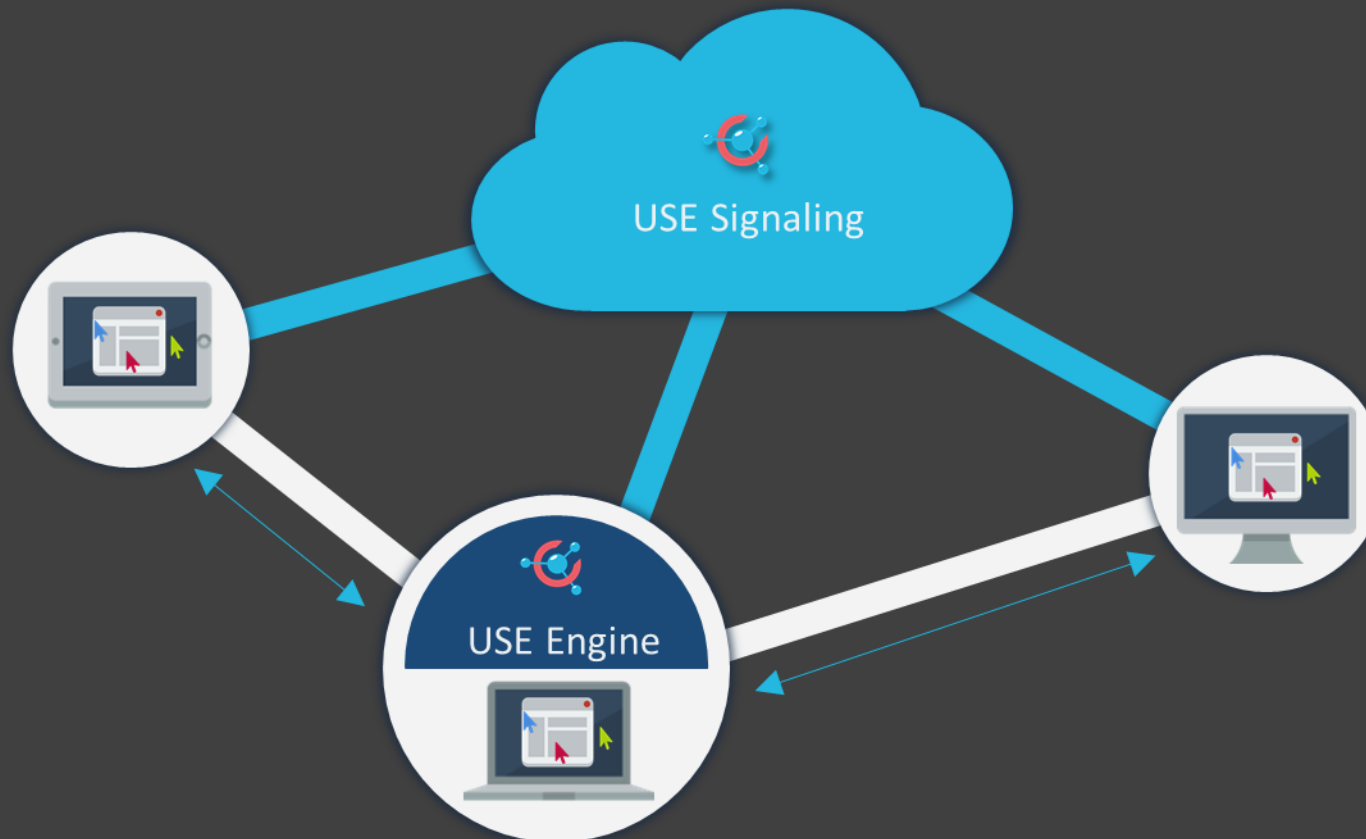
Signaling?



Web client connects to this room (the agent USE Engine) through USE Signaling Web server and they start exchanging network and media information: the signaling process

USE Together architecture

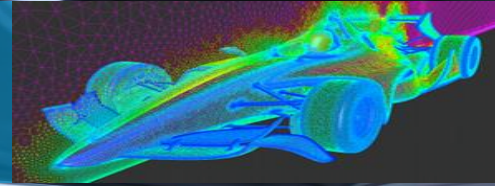
Then?



From this information, a direct connection (P2P) can then operate between them: USE Engine streams the host desktop and receives mouse and keyboard inputs from the Web client

Use Case #1

To speed-up the co-design



Manufacturing industries (Scientific Visualization – VolViz, InfoViz)



An ideal management tool for project manager

USE integrates a teleworking solution saving you travel time and money by allowing users to host web meetings and enjoy face-to-face communication wherever they are.

To work remotely with your favorite applications

- project review
- synchronous co-design
- simulation and visualization
- ...

Use Case #3

To extend collegiality



E-health and Biotechnologies (Scientific Visualization – VolViz, InfoViz)



A complete environment to share your queries and promote your results

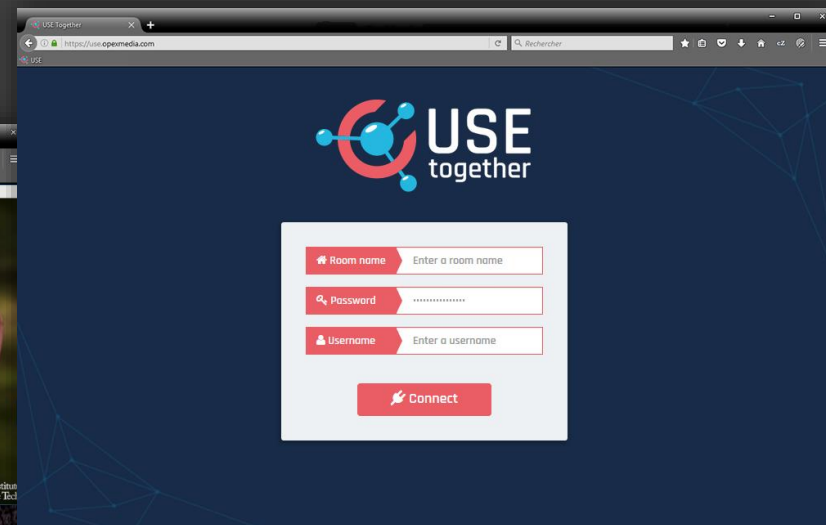
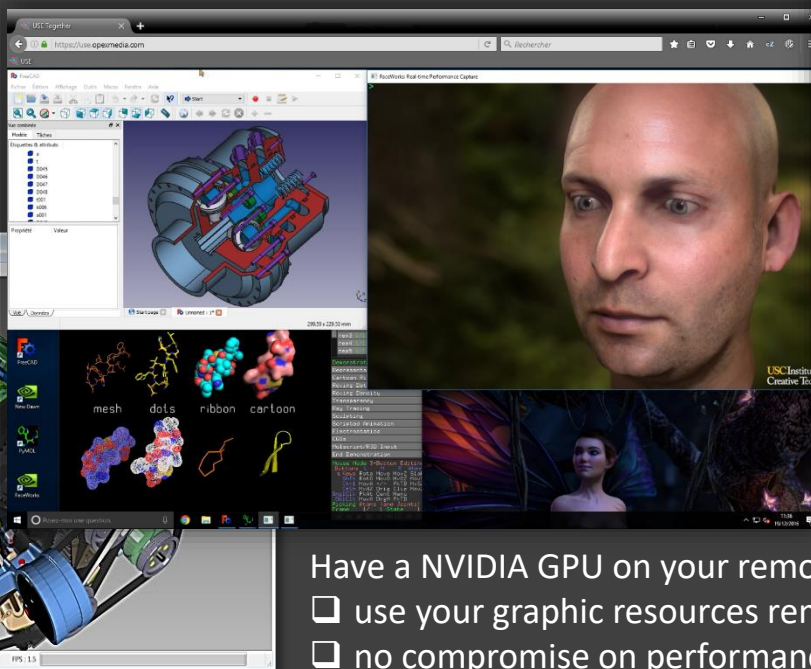
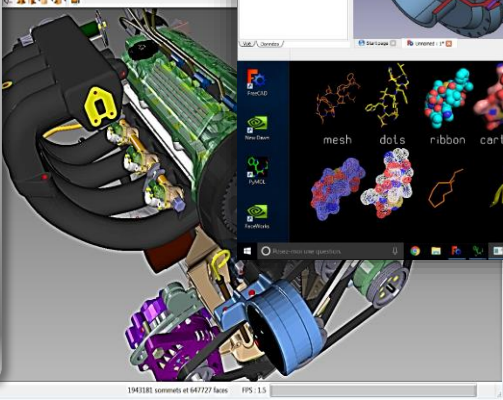
USE provides a unified working environment for both exchange with your collaborators while handling your software code on remote HPC resources.

To work with your teams and partners on a collegial basis

- jointly annotate and navigate in your data
- engage your HPC resources on your device
- visualize and interact with your simulations remotely
- ...

Demonstration

Online



Have a NVIDIA GPU on your remote desktop?

- use your graphic resources remotely
- no compromise on performances
- zero latency streaming for a near native experience



Conclusion

Future work



USE Together is a secure multi-user collaborative system allowing professionals to share their applications and data in real time, accessible from any device, over any network.

Based on WebRTC integrated protocols, a simple live streaming of your desktop is sent to the Web clients through an encrypted connection. With its P2P architecture, USE Together ensures that what is going on the streamed desktop remains on the streamed desktop, only visible from the streamer and the clients.

The use of a standard such as WebRTC makes USE Together as simple as opening a Web browser to connect, being platform and device independent. Furthermore, USE Together adapts itself to network conditions with the negotiation of multiple multimedia types and endpoints, thus producing an efficient use of bandwidth.

Remaining issues and future work

- videoconferencing support
- cross-platform support
- SDK support
- ...