

www.cern.ch

GEANT WebRTC-TF, October 27th 2015 – NORDUnet, Stockholm



Videoconferencing Developments @CERN

Joao Fernandes
CERN IT



- What is CERN?
- Remote Activity at CERN
- Vidyo@CERN: scale and infrastructure
- Future: GEANT & WebRTC

WHAT IS CERN?



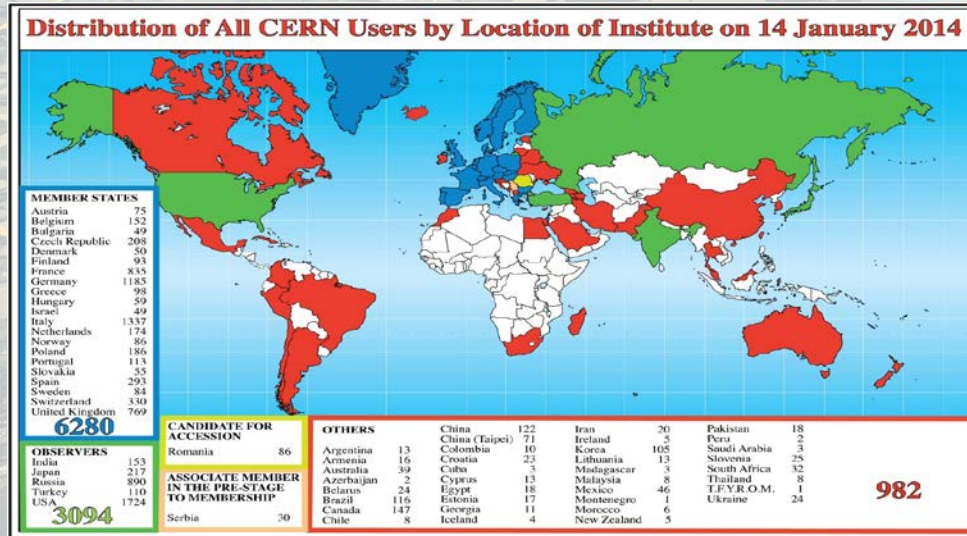
- Research Lab & Service Provider for Research
- Flagship accelerator: the Large Hadron Collider (LHC)
- 7 experiments on the LHC
- Many others out of LHC
 - AMS at ISS



Worldwide Effort

- 21 Member States

- CERN: 2500 staff, 11000 users from 600 Institutes in 87 countries



US-CERN Agreement Paves Way for New Era of Scientific Discovery

07 May 2015



Energy Secretary Ernest Moniz, CERN Director-General Rolf Heuer and NSF Director France A. Cordova sign a US-CERN agreement at the White House (Image: Ken Shippy/DOE Photo)

Desktop Videoconferencing

- Using Desktop VC since 95
 - H323 MCUs have always been « Legacy »! 😊
- Developed own Desktop VC system
 - Built on our requirements
- Change of business model in 2008
- **Contract/Partnership with Vidyo in 2011**
- Jan 2013: end of legacy desktop system support at CERN



VIDYO@CERN: SCALE AND INFRASTRUCTURE

Service Scale in Numbers

20,257 users

1600
simultaneous connections

168
simultaneous H.323/SIP

 **14**
phone access points
worldwide



3 Vidyo Panoramas

(CERN site)

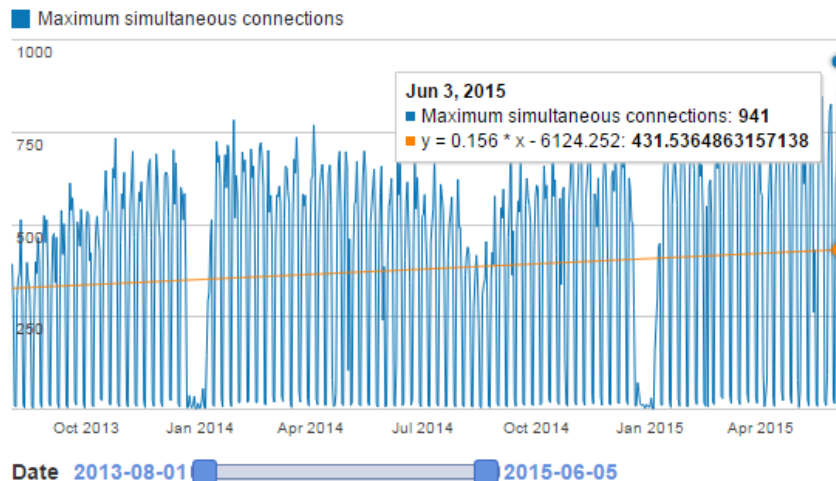
12 
simultaneous
recordings

CERN Vidyo Infrastructure

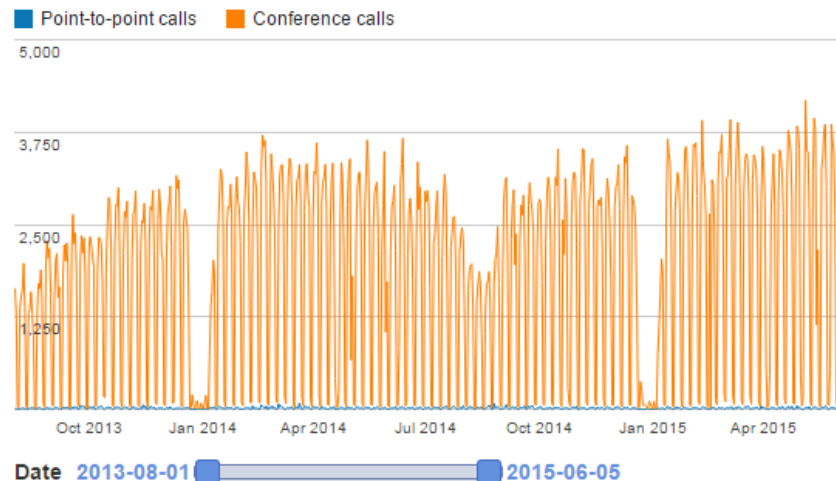


Vidyo: Usage Evolution

Maximum simultaneous connections



Total number of connections



Vidyo: Usage Evolution

Minutes in conferences

MEDIAN
3.7m

PEAK
4.8m

3.7m
minutes in September

Minutes per month

Minutes

6,000,000

4,500,000

3,000,000

1,500,000

Oct 2013

Jan 2014

Apr 2014

Jul 2014

Oct 2014

Jan 2015

Apr 2015

Jul 2015

Oct 2015

monthly

daily

Meetings

MEDIAN
6.6k

PEAK
8.2k

7.7k
meetings in September

Number of meetings per month

Meetings

10,000

7,500

5,000

2,500

Oct 2013

Jan 2014

Apr 2014

Jul 2014

Oct 2014

Jan 2015

Apr 2015

Jul 2015

Oct 2015

monthly

daily

Current Peaks

- 941 simultaneous connections
- 252 people in one meeting
- 8124 Meetings/month
- 60000+ clients installed
 - mobile and desktop
- 50 Million minutes/Year

UC EXPO
CONNECTED BUSINESS
21-22 April 2015 Olympia, London

Register Free

Seminar Title:

CASE STUDY: CERN - The World's Largest Video Collaboration Deployment

Share |    
When and Where?

Tuesday 21 April, 13:20 - 13:50

Theatre: Flexible Working & Collaboration Theatre

Speaker Name:

João Fernandes

What you will take away from this session

- Massive Scale videoconferencing for the CERN community
- 50 million communication minutes in one year
- Monitoring Dashboards for very large scale distributed video systems
- Extension from High Energy Physics to Global Worldwide Science

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Vidyo Usage at CERN Tops 50 Million Minutes in One Year

Scalable Video Conferencing Platform Key to Collaboration Among Researchers

September 23, 2014 06:00 AM Eastern Daylight Time

HACKENSACK, N.J.--(BUSINESS WIRE)--In what is likely the broadest deployment in the world of video communications within the research community, the European Organization for Nuclear Research, commonly known as CERN, has reported that its total number of minutes of Vidyo usage during the last year has exceeded 50 million. First deployed by the research organization in December 2011, Vidyo is used to facilitate seamless, visual collaboration by the center's affiliated scientists and researchers around the globe. Scientists from more than 600 universities spanning 113 countries meet on a regular basis for discussions and collaboration that is crucial to the success of CERN's research mission. Much of the collaboration has been focused on experiments involving CERN's Large Hadron Collider (LHC), the world's largest and most powerful particle accelerator.

"Vidyo's technology is helping us to expand our global research base and worldwide collaboration," stated Joao Fernandes, Global Video Conferencing Services Manager, IT Department, CERN. "As reflected in our usage numbers -- more than 50 million minutes used in thousands of meetings in one year alone - Vidyo's scalable and integrated platform supports CERN's research missions, and we view Vidyo as a key application in bringing the global research community together."

From April 2013 to April 2014, CERN calculated the total number of Vidyo

"As reflected in our usage numbers -- more than 50 million minutes used in thousands of meetings in one year alone - Vidyo's scalable and integrated platform supports CERN's research missions, and we view Vidyo as a key application in

Indico Integration

Preparation of High $H \rightarrow ZZ \rightarrow 4l$ analysis (Saclay)

Tuesday, 31 March 2015 from 09:30 to 18:00 (Europe/Zurich)

CERN (2-R-030)

BROWSER VERSION	UNIQUE VISITORS
Chrome 43.0	1143
Firefox 39.0	882
Firefox 38.0	492
Safari 8.0	413
Internet Explorer 11.0	359

1-5 of 127 [NEXT >](#)

Related report: Browsers

5

OPERATING SYSTEM	UNIQUE VISITORS
Mac OS	1471
Windows 7	1142
Linux	492
Ubuntu	444
Windows 8	313

1-5 of 22 [NEXT >](#)

Related report: Operating system family

5

Join via a
Desktop or
Mobile

Manage

Join

2-R-030

Join via
VidyoPanorama,
VidyoRoom or
H323/SIP based
conference room

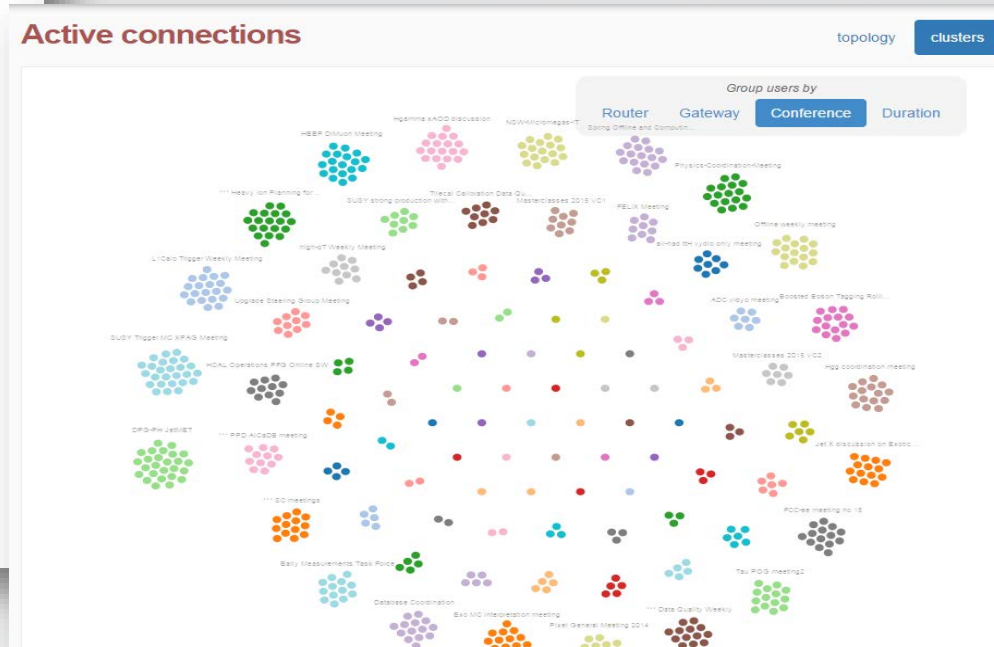
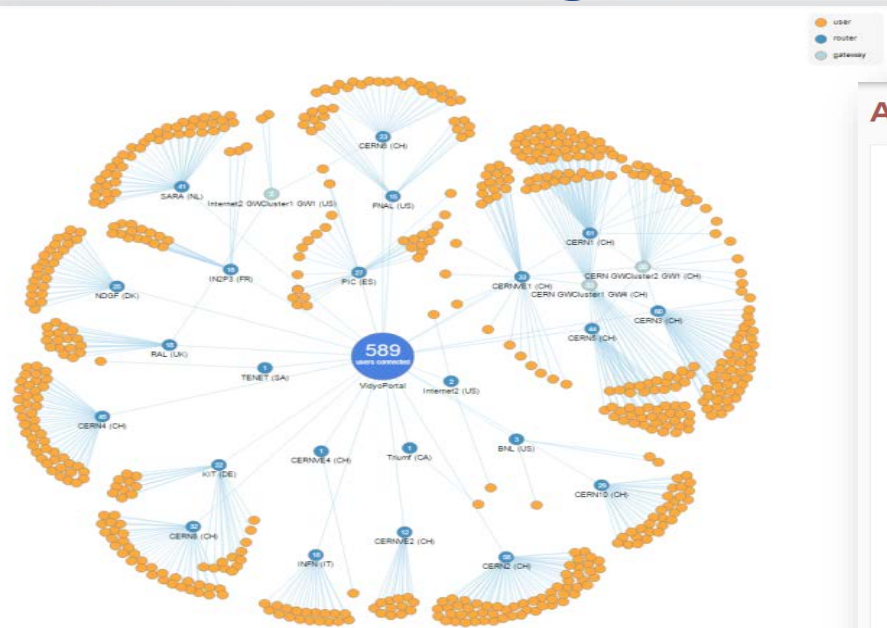
Yvette (FR))

n 30'

d'etude de Saclay Gif-sur-Yvette
iktronen-Synchrotron (DESY))

Speaker: ... Yvette (FR))

Reporting & Monitoring



- CERN Development
 - Live Dashboards for users and managers

Available at: <http://avc-dashboard.web.cern.ch/Vidyo>



FUTURE

What's Next?

- Extension to All Research Domains (Q4 2015)
 - Tripartite partnership CERN/GEANT/Vidyo
 - Leveraging CERN's worldwide infrastructure for R&E
 - CERN's Vidyo IaaS
- WebRTC client development (Q4 2015)
- « Intelligent » Infrastructure Virtualisation (2016)
 - Automatic setup of infrastructure following thresholds of usage
 - Openstack based
 - Phase 1: between CERN and Wigner (Hungary) to cover EU

GEANT-CERN-Vidyo Partnership

- Successful Experience across the High Energy Physics community
- International footprint
- Approach from several R&E Organizations, mostly out of HEP with the question:

“How can I use your Vidyo or Indico for my Community in a secured, dedicated and customized way?”

CERN
Tenant

Tenant
1

Tenant
2

Tenant
N



CERN Vidyo
Portal

Federated
Authentication

indico

Community
1

Community
2

Community
N

Organization 1

Organization 2

Organization N



Where are we now?

- Financial model defined
- Legal model defined
- Setting signing date
- 2 Pilot Tenants:
 - SWITCH and GEANT
 - 3 International collaborations based at FNAL (US) testing under the CERN Tenant
- Several conversations ongoing
- Next Steps: Sign the agreement and make a Press Release 😊

WebRTC – Objectives

- Build the Knowledge
- Collect feedback
 - Highly “Web oriented” community
- Contribute as standard and evolves
- Belief that WebRTC will turn collaboration vendor agnostic
 - And provide interesting possibilities to develop Open Source code

WebRTC - Vidyo Stack

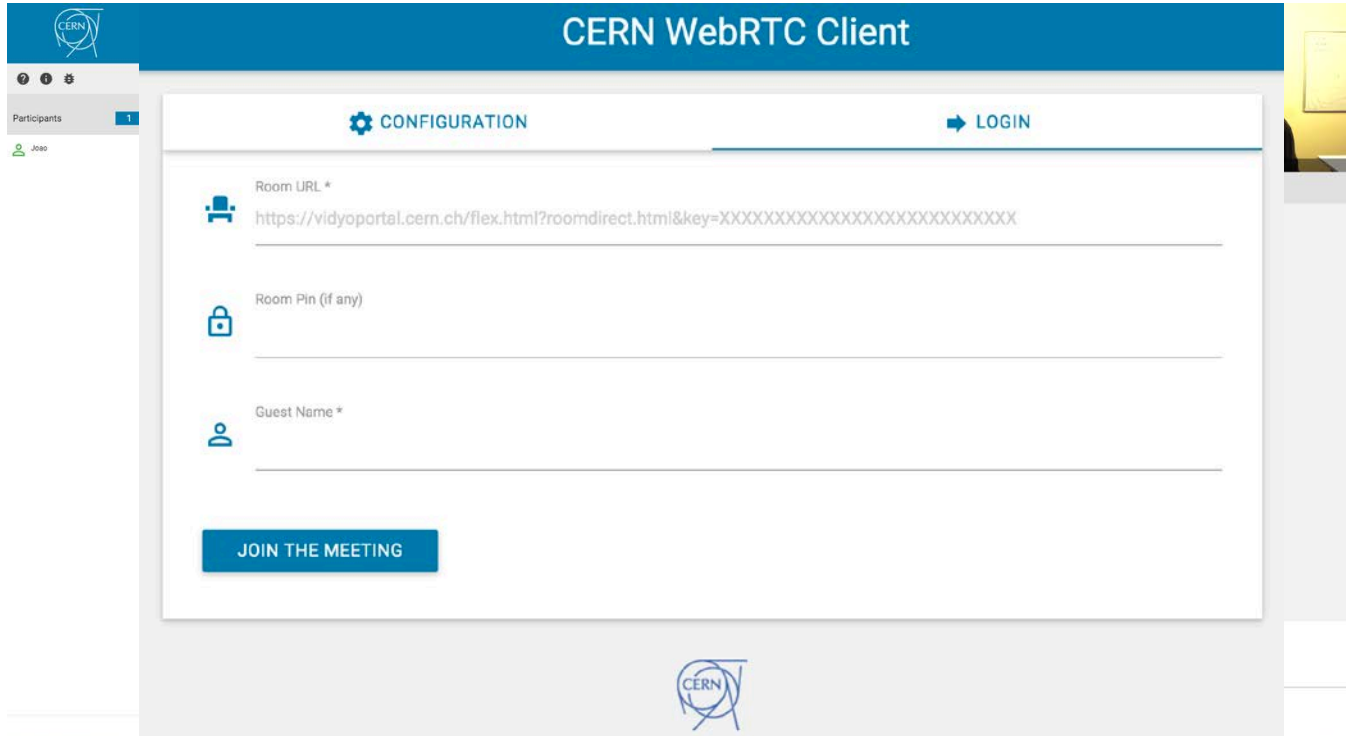
Rich Video-enabled Applications
(WebRTC and ORTC support)

vidyo.client.js

Vidyo Portal and Router APIs

- Developers meetings
 - Swisscom, Vidyo, CERN
- Identification of common use cases
- Definition of common strategies
- Prioritize features

CERN WebRTC client 0.1



The screenshot displays the CERN WebRTC Client interface. At the top, a blue header bar contains the CERN logo on the left and the text "CERN WebRTC Client" in the center. Below the header, a sidebar on the left shows a "Participants" list with one entry, "Joao". The main content area is titled "CONFIGURATION" and features a "LOGIN" button. It contains three input fields: "Room URL *" with a pre-filled URL, "Room Pin (if any)", and "Guest Name *". A "JOIN THE MEETING" button is positioned at the bottom of the form. The CERN logo is also visible in the bottom right corner of the interface.

CERN WebRTC Client

CONFIGURATION LOGIN

Room URL *
<https://vidyoportal.cern.ch/flex.html?roomdirect.html&key=XXXXXXXXXXXXXXXXXXXXXXXXXXXX>

Room Pin (if any)

Guest Name *

JOIN THE MEETING


CERN

Roadmap

- WebRTC Server 3.3 (Now) and 3.4
 - Support of VP9
 - Support of Microsoft Edge (ORTC)
 - Support of end user registration
- WebRTC API Next Generation (2016)
 - Release together with Next Gen client (*Neo*) and infrastructure (*Trinity*)
 - Native WebRTC support across all elements of the infrastructure

To Conclude...

- Ensure a worldwide service
 - That works, but without “vendor locking”
 - Following standards, helping to shape the emerging ones
 - Adding intelligence, scalability, interoperability
 - Both at application and infrastructure level
 - Providing Open Source development opportunities



Thank You!
Questions?

