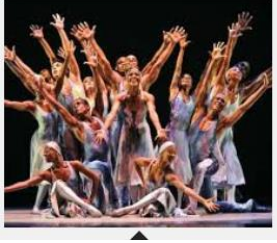
# Cyber performances, new experiences on technical and artistic collaboration across Internet

Jiri Navratil [1], Sven Ubik [1], Nikita Krein [2], Alain Baumann [3],
Rosa Sanchez [3], Justin Triger [4], Jocelyn Peres [4],
Thomas Solak [5], Jana Bitterova [6], Ian Briscoe [6]

**[1] CESNET, [2] The Unlimited Trio Prague, [3] Konic Theater Barcelona,**
**[4] NWS Miami, [5] DKDM Copenhagen, [6] Studio Biscoe (UK)**

Computer Graphics and Animation 2017,
September 25th - 26th, Berlin, Germany



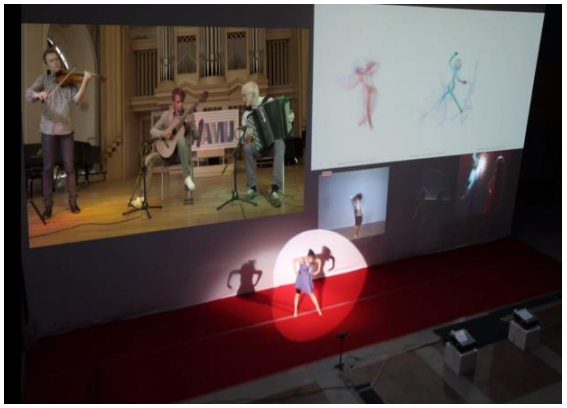






# Live Digital Performance

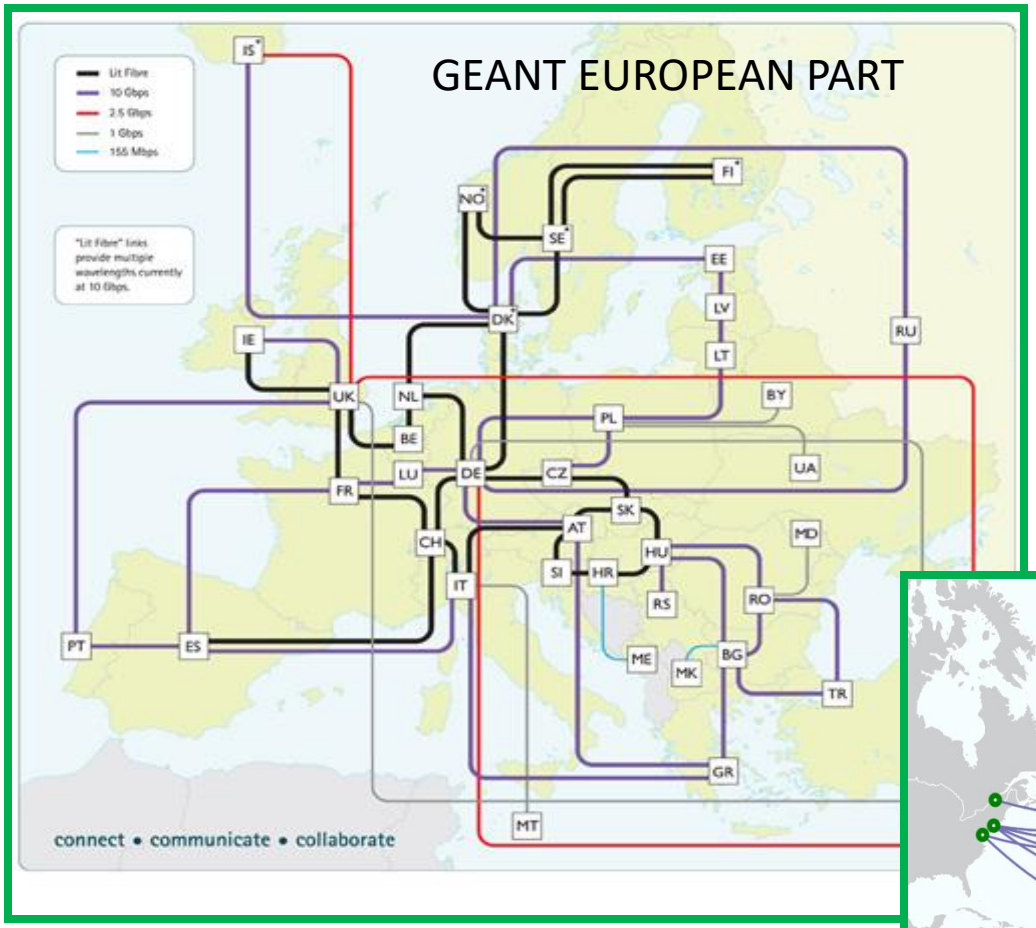
**Digital Performance** is a category filled with very wide range of productions.
It is a generic performance with extra elements
integrating computer technologies and techniques.
Usually it incorporates multimedia whether it is live on a theatre stage or in the street.



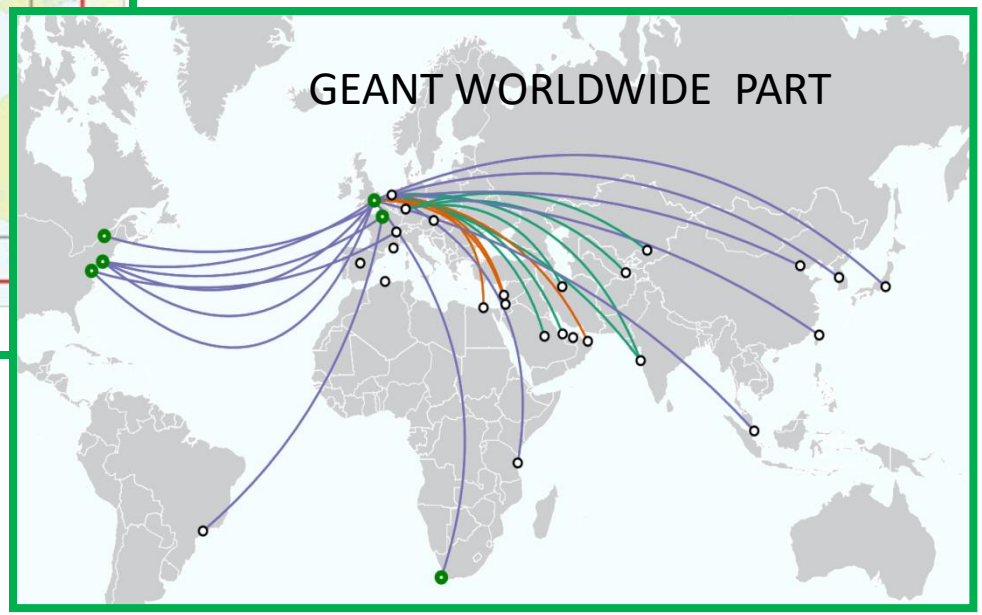

Thanks to high **speed networks** and to **efficient transmission tools**
we can create **distributed environment in world scale**.

**Live Digital Performance will change to CYBER PERFORMANCE**

# CESNET is part of GEANT (European Academic Network)

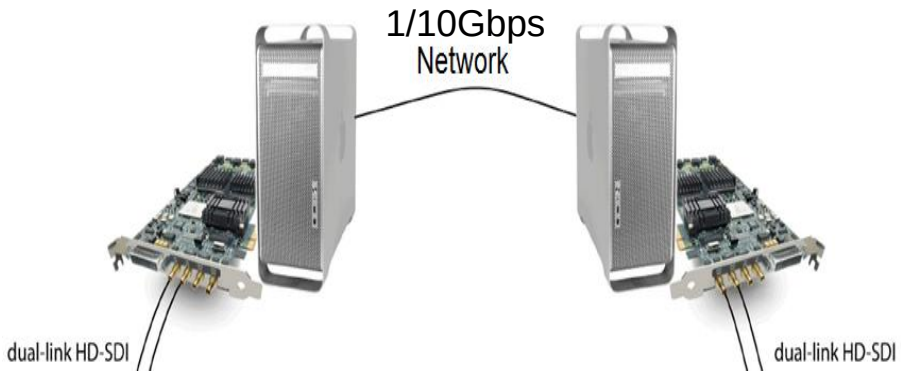


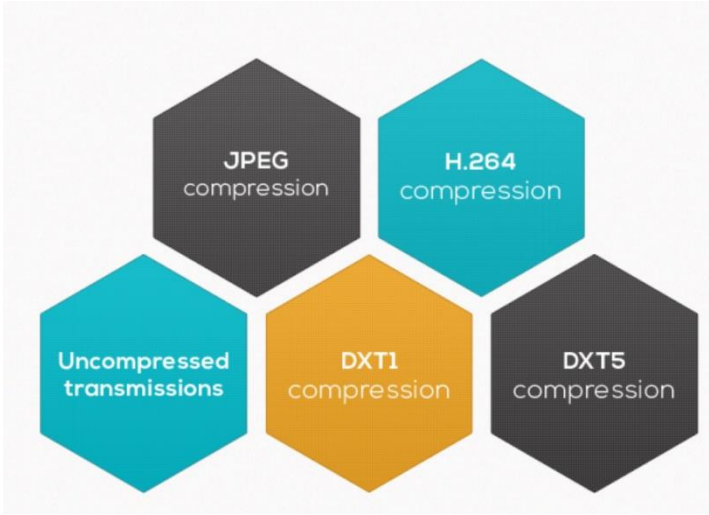

GÉANT



# ULTRAGRID

Transmission tool with wide scale of compression options



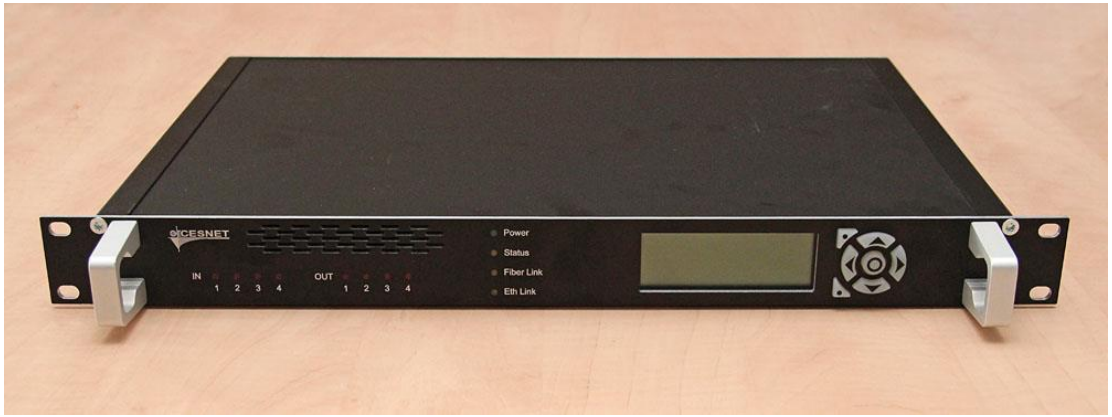




Linux, OS-X, WINDOWS
+ Network and Media cards

More details on
http://www.ultragrid.cz/en
https://www.sitola.cz/igrid/index.php/UltraGrid
https://www.sitola.cz/igrid/index.php/Performance

# Modular Video Transmission Device (MVTP)

- Developed by CESNET
- Standalone device (no PC required)
- 4Kp60 video, 16x 24-bit/48 kHz embedded audio
- Uncompressed or TICO compression
- Added latency under 1 ms
- Compression rate up to 10:1, bitrate 120 Mbps for HD at 30fps
- 3-point connection (triangle) can be setup



# The previous experiences

## Invitation to
## APAN – Asian Pacific Advanced Network Meetings

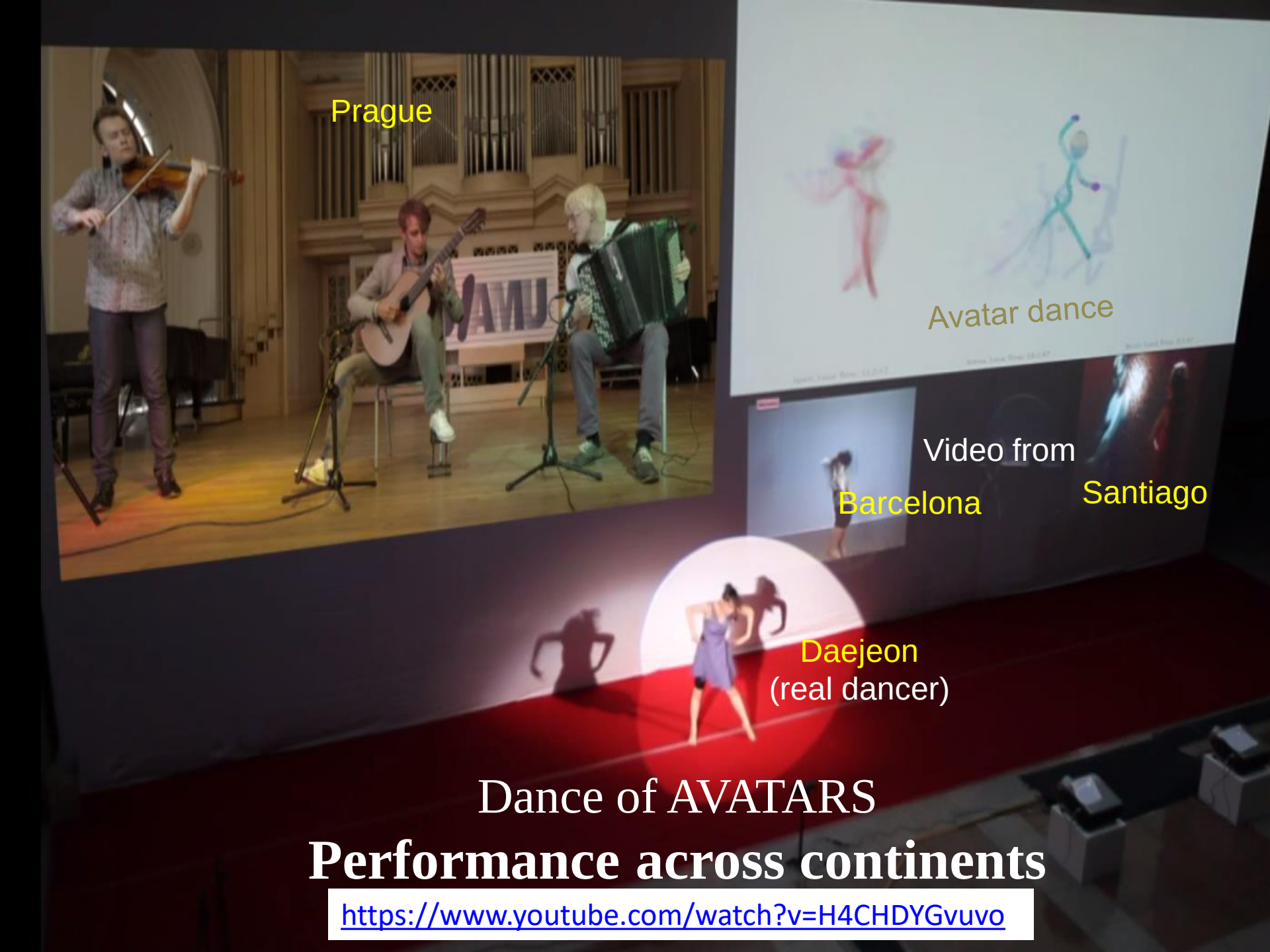
**Regular meetings of network and IT specialists for different fields organised twice a year in Working Groups**

**Culture WG**

**focus on the technology requirements**
**for performing arts education, multi-site performance events or cultural heritance based on high quality netcasting over advanced research networks.**

CESNET regularly participates on these events

2012 APAN 35 Honolulu, Hawaii USA, **3D Chamber concert**
2013 APAN 36 Daejeon, Korea, **Dance of Avatars**
2014 APAN 38 NanTou Taiwan, **Distributed Quartet + Dancers**



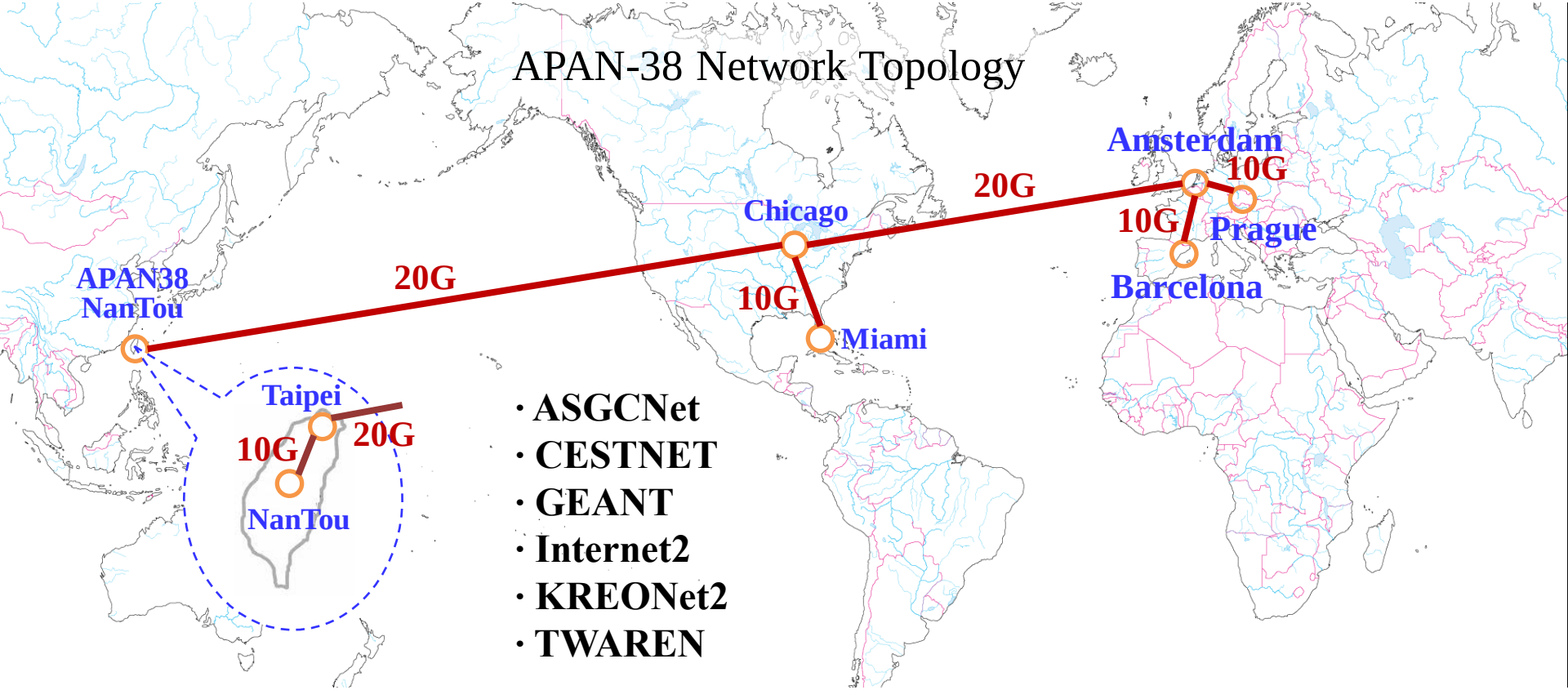

# Dance of AVATARS

# **Performance across continents**

https://www.youtube.com/watch?v=H4CHDYGvuvo




# Distributed quartet (Prague - Miami) and dancers in Barcelona and Nantou



# Distributed quartet and remote dancers

Result: illusion of one scene




APAN 38 Nantou Taiwan - Closing Ceremony

https://www.youtube.com/watch?v=mvCc7_U93cA

# The newest events

## NPAP - Network Prerforming Arts Production Workshops

**Regular meetings of technical specialists and artists**.

Workshop focus on the technology
requirements for performing arts education, multi-site performance events and high quality netcasting over advanced research networks.

CESNET regularly participate s on this workshop with technical lessons about developed tools for video transmission Ultragrid and MVTP4K which are frequently used by this community for demos and life performances

2015 Violin from Prague and piano in London
2016 Organ in Brno and trumpet in Miami
2017 “Similarities” in Copenhagen




Recording is on YouTube and on JISC web pages of NPAP workshop
https://www.youtube.com/watch?v=euyM7zkKFkQ




New World Symphony  stage at Miami

https://www.youtube.com/watch?v=eRi6u9Wo0xk

# NPAPWS 2017 Cyber Performance

## Preparation process

1/ selection of partners (December, 2016)
2/ selection of locations
3/ discussion about content
4/ create distributed environment
5/ performance with two parallel audience places (Prague, Copenhagen) April 3rd, 2017

# Introduction of key partners

**CESNET**

is research organization and also provider of powerful e-infrastructure for universities and research institutions in the country.
Research is focused into optical networking, video transmission and network security. In frame of research activities developed tools for transmission video with high resolutions, Ultragrid and MVTP4K. CESNET is organizer of life Network Performances. More on https://www.cesnet.cz/?lang=en

**The Unlimited Trio**

Is famous band from students of Music and Dance Faculty of the Academy of Performing Arts in Prague, The Unlimited Trio is an experimental instrumental musical project. The trio's main purpose is to create music without any stylistic borders or limits. See more https://www.facebook.com/theunlimitedtrio/

**Konic Theatre**

is world leading artistic platform focusing on temporary creation between art and IT. Rosa Sánchez & Alain Baumann are leading the conceptual, creative and technological developments in Kònic (Thtr&Lab).
See details http://koniclab.info/

**NWS Miami**

The New World Symphony, America's Orchestral Academy, prepares highly-gifted graduates of distinguished music programs for leadership roles in orchestras and ensembles around the world.
See more https://www.nws.edu/

**DKDM Copenhagen (RDAM)**

The Royal Danish Academy of Music is a power centre in the classical music world, representing the highest international level and compares and cooperates with a number of the foremost music academies in the world.
More http://english.dkdm.dk/

**Studio Biscoe**

Ian Biscoe is a visual and performance artist, director, producer, entrepreneur, designer and engineer with degrees in architecture and landscape architecture. More http://studiobiscoe.com/. Ian is often working with Jana Bitterova. Jana is a dance artist – choreographer, performer, improviser and creative movement facilitator. More http://movementtouch.com/about-cz/

# NPAPWS 2017 Cyber Performance
## Locations




Copenhagen RDAM




Barcelona MACBA



Miami NWC




Prague NTK

# NPAPWS 2017 Cyber Performance

## Stage in destinations



Copenhagen RDAM garden



Barcelona MACBA



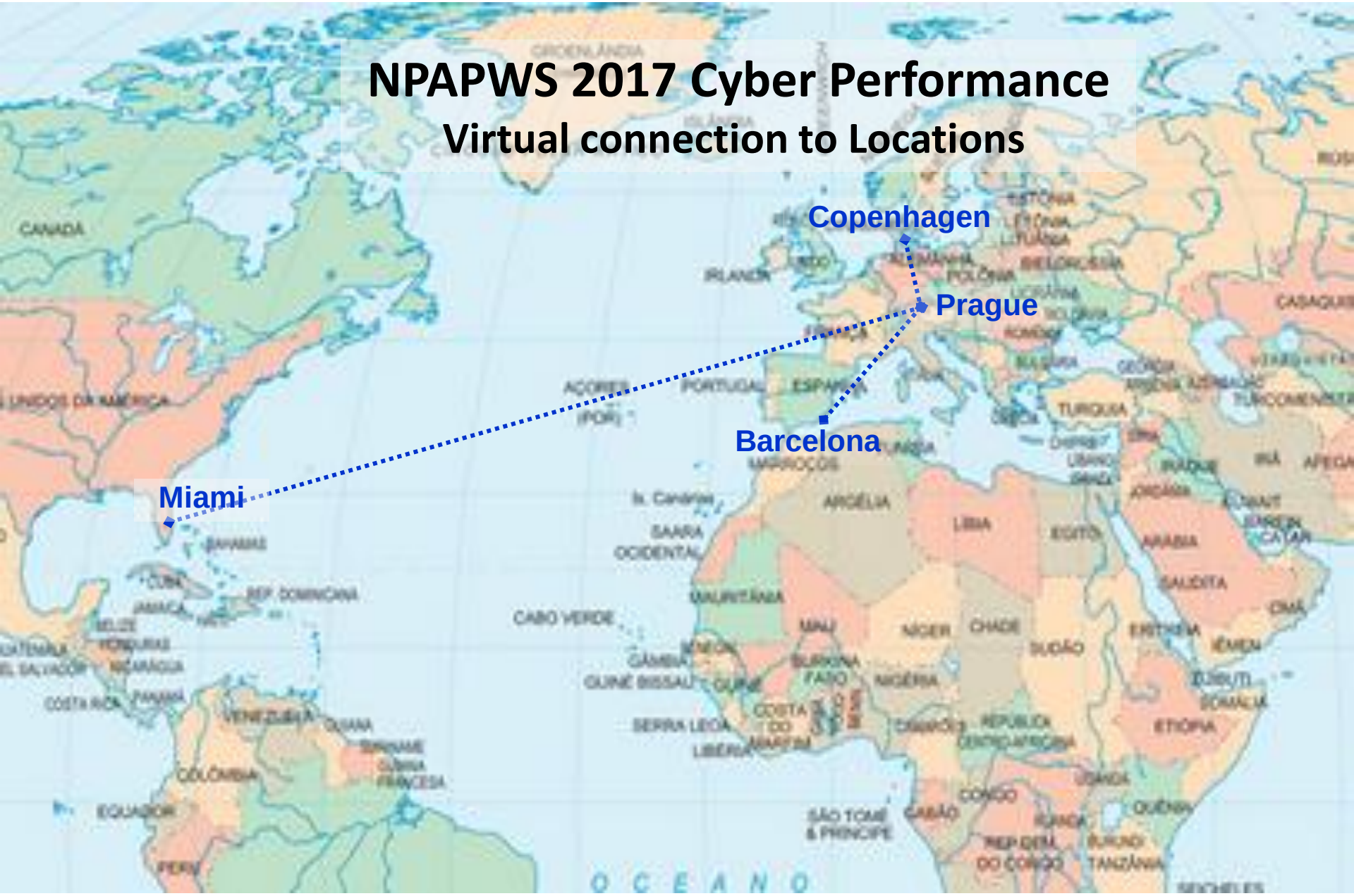
Miami NWC roof garden




Prague NTK

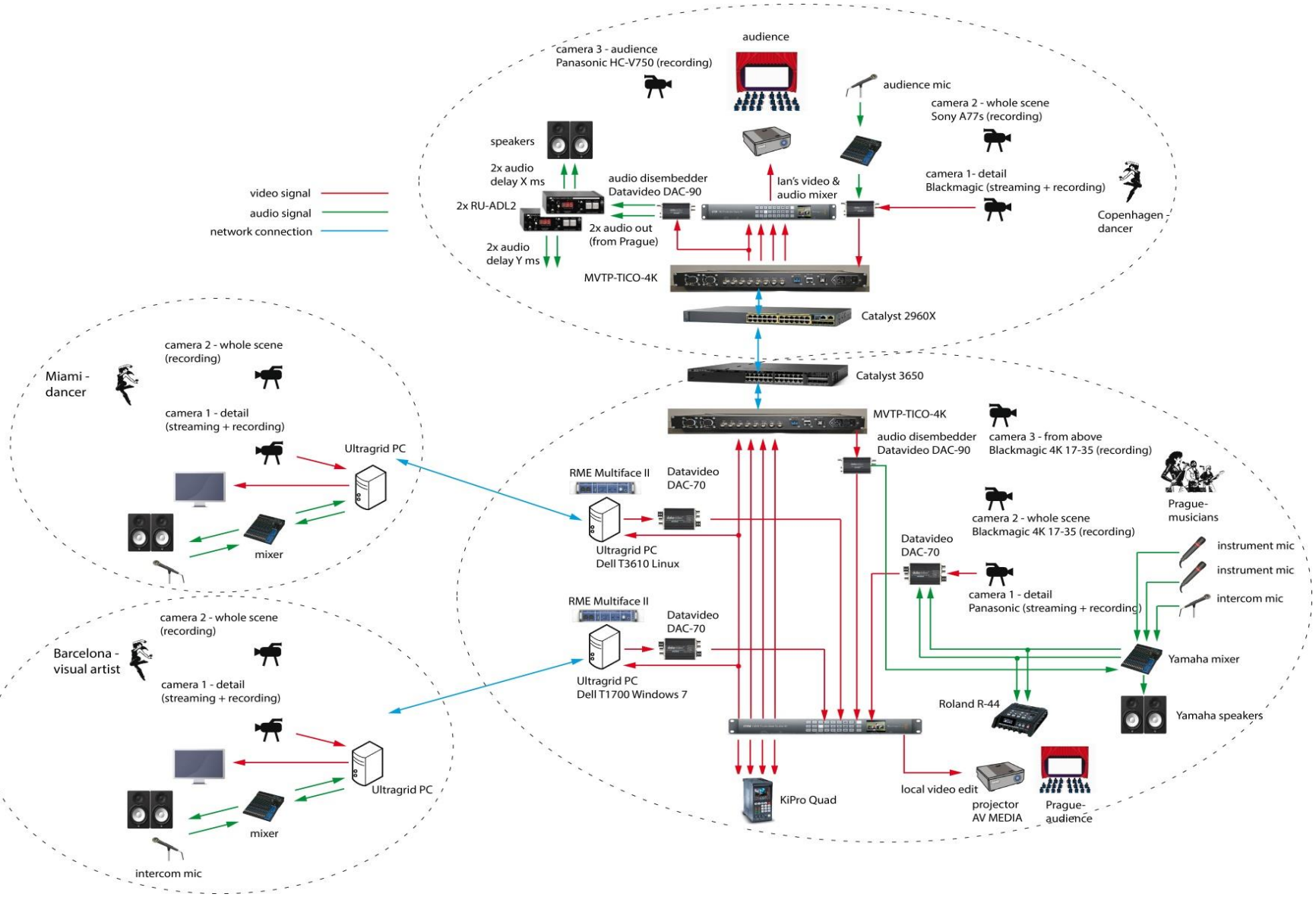
# NPAPWS 2017 Cyber Performance

## Virtual connection to Locations



# NPAPWS 2017 Cyber Performance

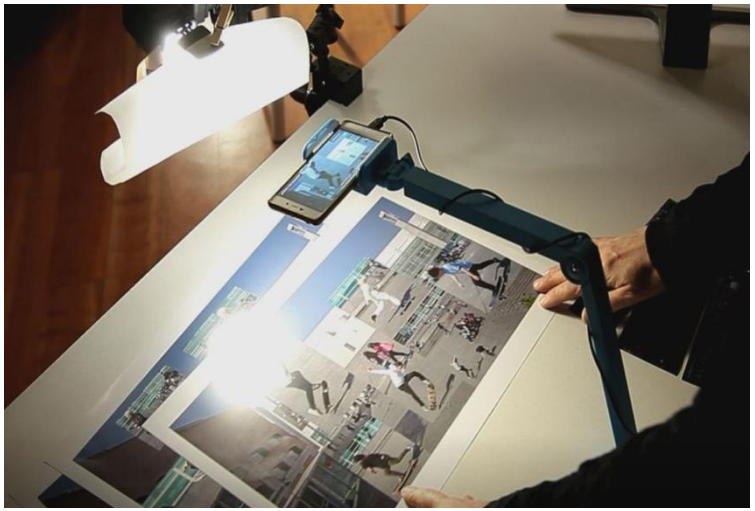
## Network and Multimedia Configuration



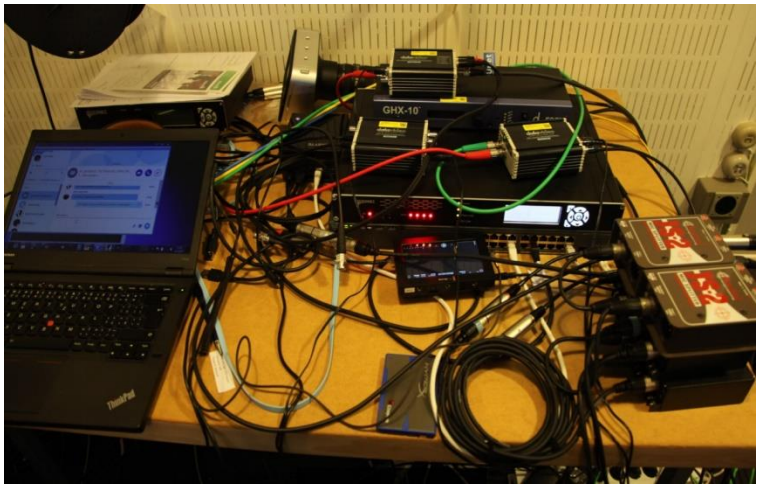
# NPAPWS 2017 Cyber Performance

## Few details of technical background







# NPAPWS 2017 Cyber Performance

## Content: „Similarities“

**In the beginning several scenarios:**
a/ utilize exteriors and interior of selected buildings with mirrors, flashing lights, etc.
b/ the dancers prefer more space in outdoor

**Final solution February 2017/compromise:**
Musicians - inside NTK
Performer in Barcelona - inside MACBA
Dancers in roof garden in RDAM and roof garden in Miami

**Cyber Performance will follow story proposed by Jana Bitterova called Similarities**

**Performers are the guides on the journey through their locations.**

**Dancers** guide the audience through their location via movement, which is directly interacting with and interpreting various features of their respective location (shapes, forms, colors, structures of the place).

**Musicians** are providing a unifying soundtrack for dancers and performer. The musicians also react on the dancers' movements.

# NPAPWS 2017 Cyber Performance

**Distributed environment:** *Copenhagen, Barcelona, Miami, Prague*



# NPAPWS 2017 Cyber Performance

## Camera and Directions



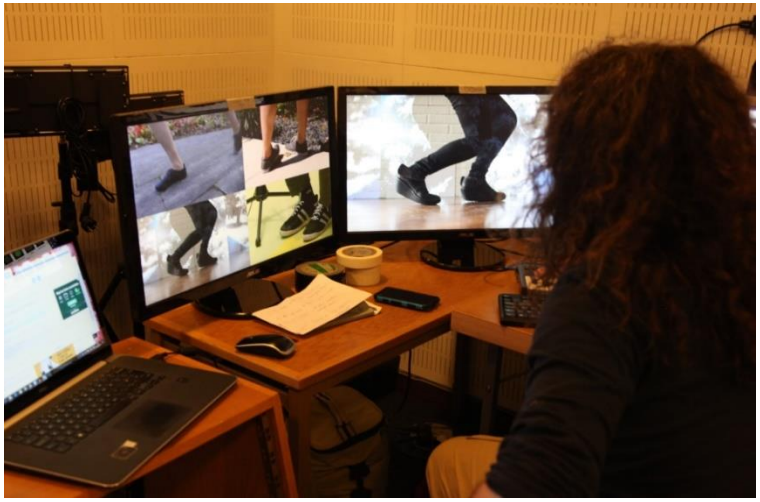
Miami



Barcelona



Direction in Prague



Direction in Copenhagen

# NPAPWS 2017 Cyber Performance

## CP is running in Real Time on all sites









Copenhagen

Prague

Barcelona

Miami

# Editors had always 4 videa for online editing



# On-line Presentation in RDAM Copenhagen

For NPAW 2017 participants



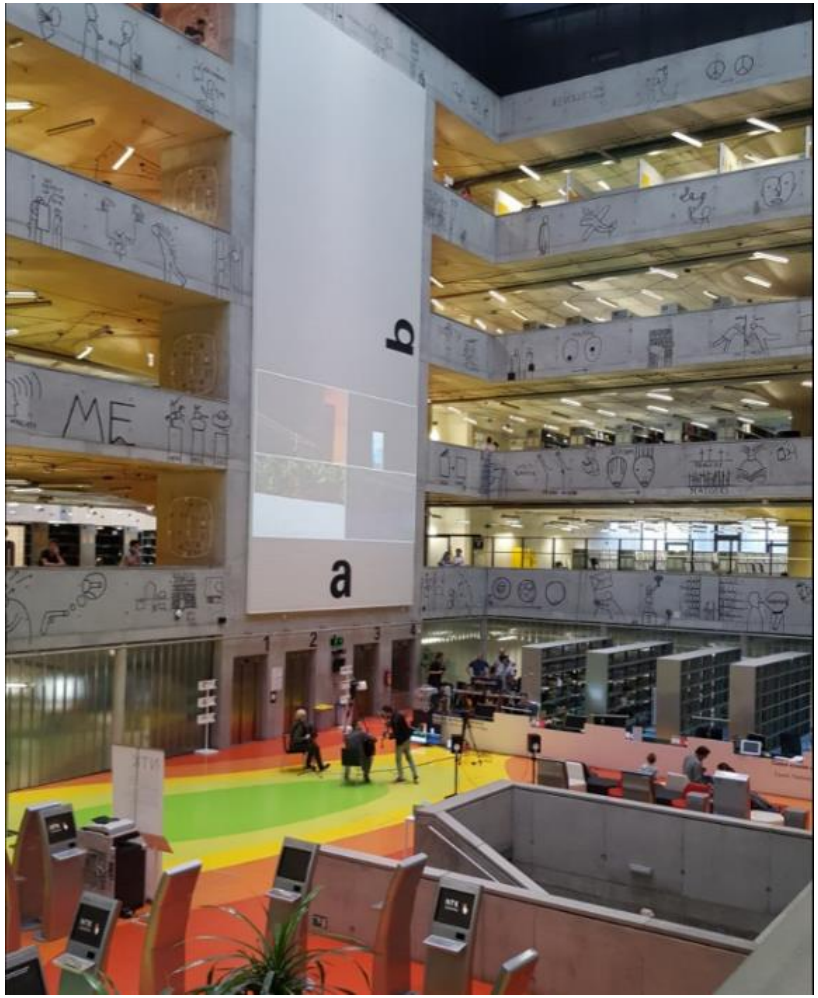

Edited by Ian Biscoe

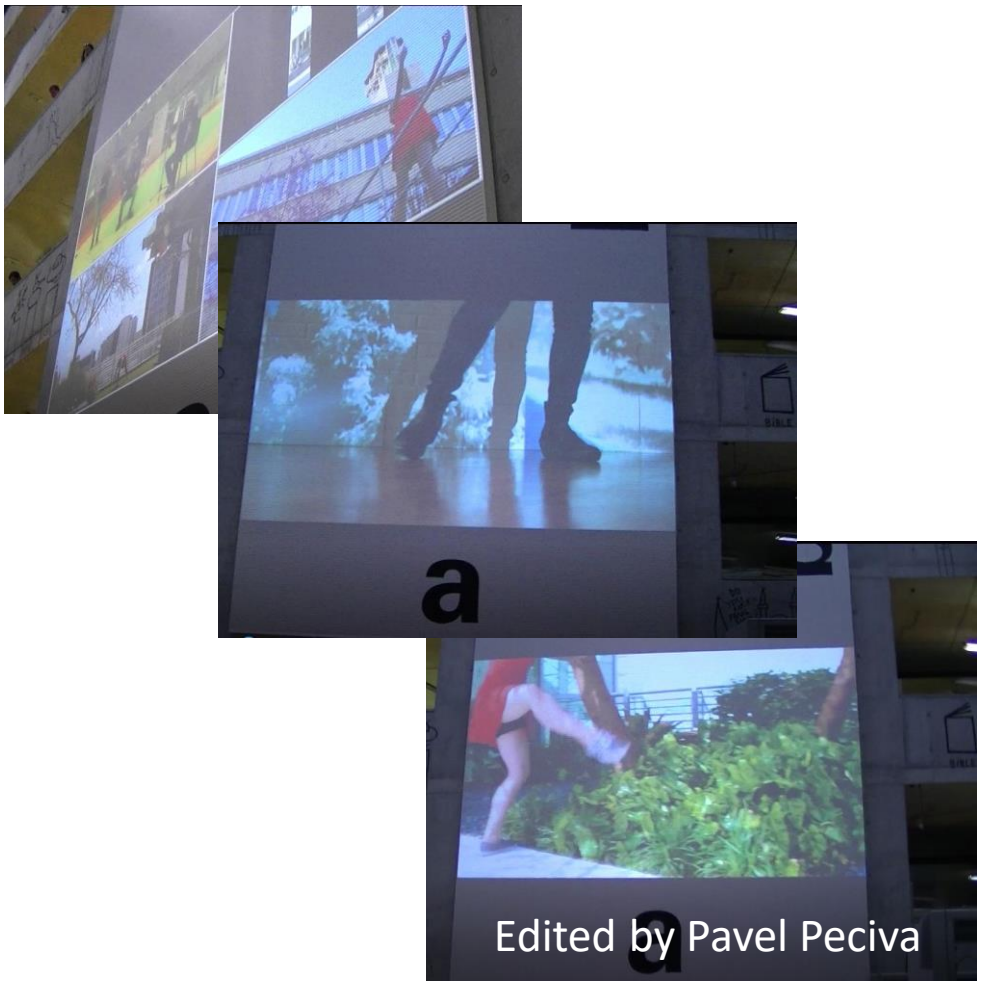



In theatre conditions

# Parallel On-line Presentation in NTK Prague

for many regular visitors  of NTK




In daylights  conditions , large scale screen with special strong projector

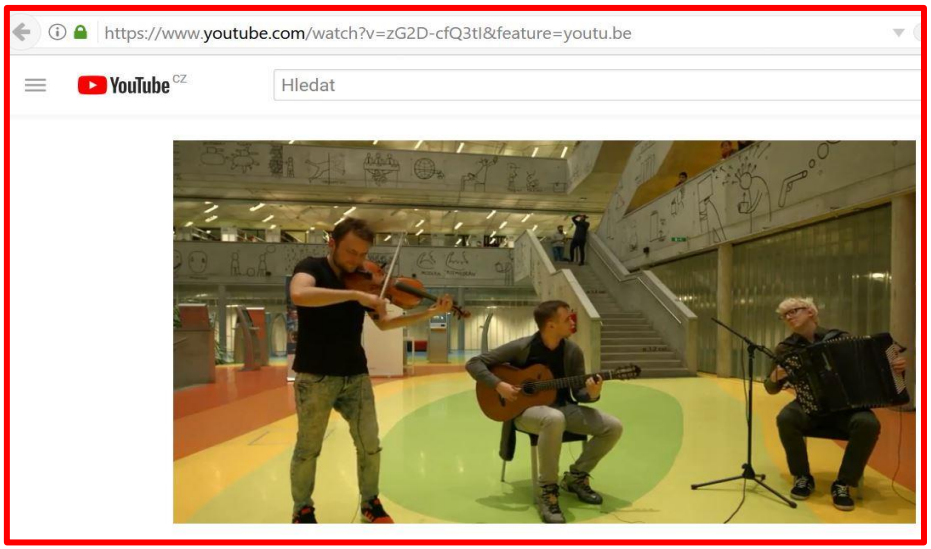
# NPAPWS 2017 Cyber Performance

Prague's team after presentation

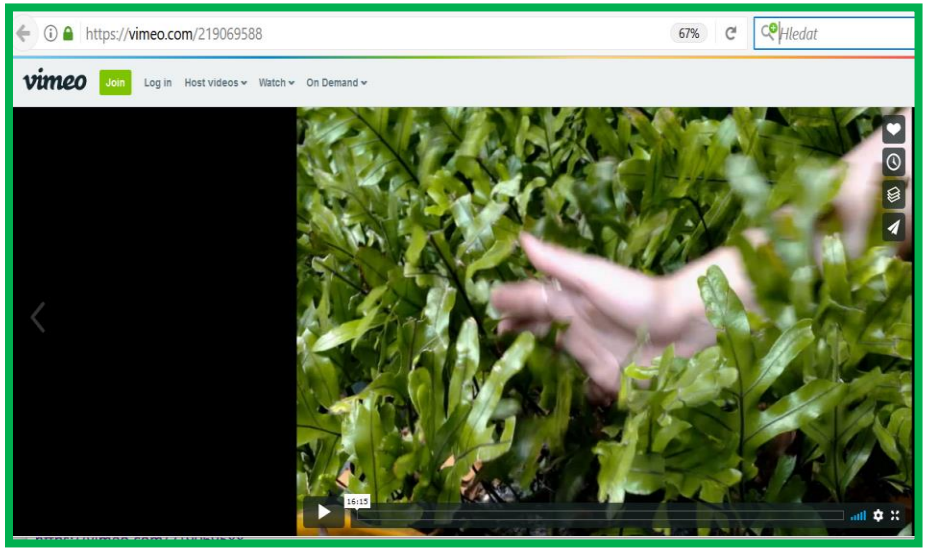


# NPAPWS 2017 Cyber Performance

## Presentations on Internet




Version from Prague presentation
https://youtu.be/zG2D-cfQ3tI




Version from Copenhagen presentation
https://vimeo.com/219069588

# NPAPWS 2017 Cyber Performance

## Great thanks to all partners









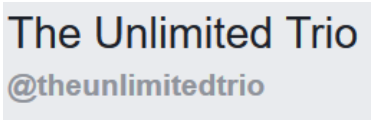


























**Thank you**
**for your attention**