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**ICT - Information and Communication Technologies**

**Deliverable D4.5**  
***Report on organisation of events and engagement activities***

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## Executive Summary

This document reports on the organisation of EMPOWER events and engagement activities within the second part of the project covering the period M19-M42. During this period, the different activities for engaging the community were planned and discussed within the EMPOWER group. The tools include the organisation of theNetworkingChannel, organisation of Hackathon, workshops and tutorials.

In addition, EMPOWER contributed/participated in several relevant international events, such as [EuCNC](#), [IFIP Networking Conference 2022](#), the [Mobile World Congress](#) in Barcelona, [IoT Week](#), etc. The detailed list is included.



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## 1. Introduction

EMPOWER had the ambition to accelerate the joint development between the EU and the US of advanced wireless platforms targeting the new connectivity frontiers beyond 5G. The overarching aim of EMPOWER was to reinforce the cooperation between the EU and the US towards establishing a collaborative transatlantic community on the new connectivity frontiers beyond 5G with the ambition to accelerate the joint development of the associated advanced wireless platforms.

EMPOWER acted as a catalyst for promoting EU-USA technology and test platforms in industry-driven events such as ONS, OPNFV Summit, TIP Summit, MWC as well as high profile IEEE and ACM conferences. Specifically, it coordinated the preparation of selected demonstration targets for these events with the technical teams from its companion projects.

This document reports on the organisation of EMPOWER events and engagement activities within the second reporting period M19-M42 of the project.

## 1. EMPOWER Strategic decisions

Considering the unexpected situation due to the outbreak of the COVID-19, early 2020, the consortium had to reshape a significant part of the strategy and activities initially planned in the previous versions of the EMPOWER Community engagement and event organisation report. COVID-19 restrictions, and the global pandemic uncertainties obliged EMPOWER partners to re-organize their activities and tools in order to ensure the impact of the project. The way the project had faced these issues is by initiating a very successful activity, TheNetworkingChannel (<https://networkingchannel.eu>), where experts on different networking areas (with a priority on USA/EU collaboration) present key topics on networking. EMPOWER together with the NSF PAWR Office, and in cooperation with [ACM Sigcomm](#), acting as a catalyst between the global communities involved in future advanced networking activities, aimed to continue this dialogue and build community in this unprecedented time and beyond, organizing a series of events as an online “channel” where the global networking research and education community will be able to meet and share.

## 2. TheNetworkingChannel

As a consequence of the COVID Pandemic and its effects on the physical barriers and difficulties to cooperate, EMPOWER took the initiative to launch together with the NSF PAWR Office, and in cooperation with ACM Sigcomm, theNetworkingChannel (<https://networkingchannel.eu>), acting as a catalyst between the global communities involved in future advanced networking activities. It aims at continuing the dialogue and build community in this unprecedented time and beyond, organizing a series of events as an online “channel” where the global networking research and education community will be able to meet and share.

The networking community channel is organized as a regular event, taking place **every other Wednesday, at 8am PST (11am EST, 5pm CET, 1am JST)**, where a diversity of events is organized for the community, live and pre-recorded. Topics are broad and open ranging from research to experimentation and education. The channel consists of webinars, panels, tutorials, virtual site visits, keynotes, and any other innovative forms of community interaction. A YouTube Channel (<https://www.youtube.com/channel/UCAfFAG5JdQrHac6Ar1WJ-hw>, see (Figure 89) is available where previous streams can be downloaded and viewed asynchronously.

The Programme Committee co-chairs are:

- Matthew Caesar, University of Illinois, USA
- Serge Fdida, Sorbonne Université, France
- Abhimanyu Gosain, Northeastern University, USA
- Jim Kurose, University of Massachusetts, USA
- Stavroula Maglavera, University of Thessaly, Greece (communication/administration)

### 2.1 TheNetworkingChannel episodes

The Networking Channel started its operation on 24/3/2021 and organized the following events:

#### 2.1.1 [Episode 1 - The Network will be programmed by many, operated by a few](#)

The event organised on 24/3/2021 Jim Kurose, Professor of College of Information and Computer Sciences at the University of Massachusetts Amherst.

The keynote speech delivered by **Nick McKeown** – Professor of Computer Science and Electrical Engineering, Stanford University with a panel of graduate student discussants from around the world:

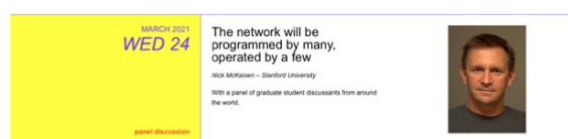


Figure 1: TheNetworkingChannel event website (episode 1)



(1) Weihan Chen – Tsinghua University, China; (2) Irene de Gruijter Eguiluz – University Carlos III, Spain; (3) Ananda Gorck Streit – Federal University of Rio de Janeiro, Brazil; (4) Inaam Ilahi Information – Technology University, Pakistan; (5) Ranysha Ware – Carnegie Mellon University USA.

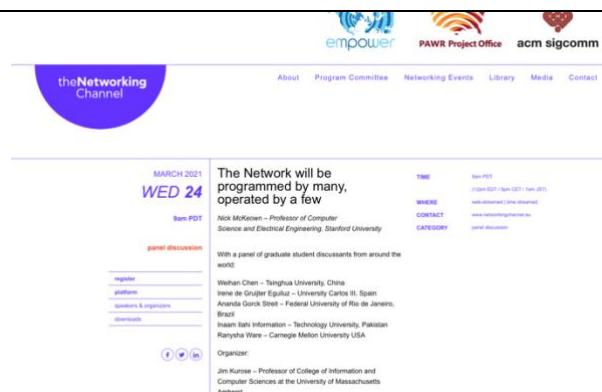


Figure 2: The agenda (episode 1)

The statistics of the episode are shown below:

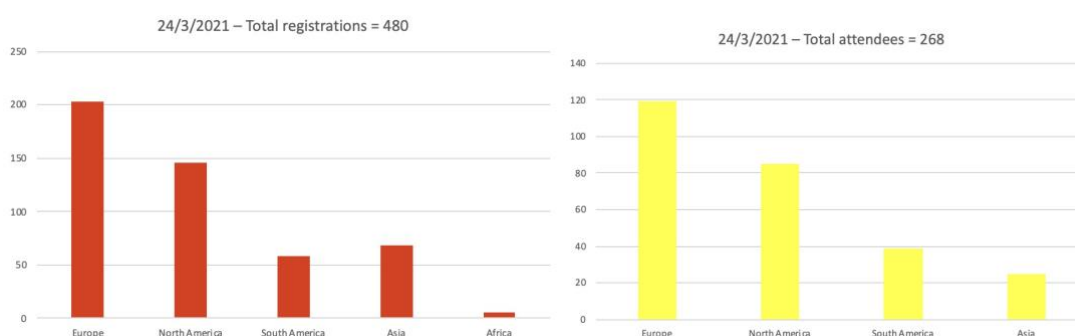


Figure 3: The statistics of Episode 1 (a) – the registrations per region (b) the attendees per region

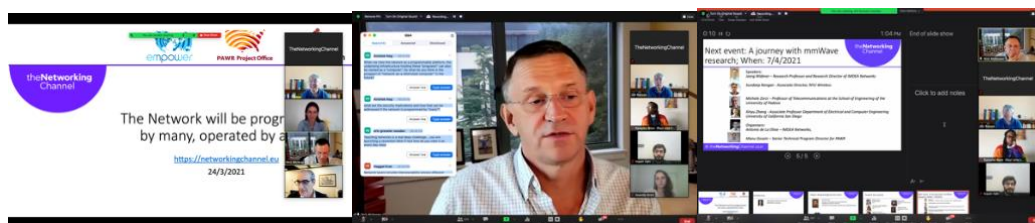


Figure 4: Moments of episode 1

### 2.1.2 Episode 2 - A Journey with mmWave research

The event organised on 7/4/2021 from Antonio de La Oliva – Universidad Carlos III Madrid (UC3M) and Manu Gosain – Senior Technical Program Director for PAWR. It included a panel of experts:

- Joerg Widmer – Research Professor and Research Director of IMDEA Networks;
- Sundeep Rangan – Associate Director, NYU WIRELESS;
- Michele Zorzi – University of Padova, Italy;
- Xinyu Zhang – Associate Professor, Department of Electrical and Computer Engineering, University of California San Diego.



Figure 5: TheNetworkingChannel event website (episode2)

The key points of the discussion were: First generation millimeter-wave devices using the IEEE 802.11ad WLAN standard never saw widespread deployment, since most current applications work equally well with the data rates offered by sub-6 GHz IEEE 802.11ac. However, more bandwidth-hungry applications are on the horizon and there is little doubt that millimeter-wave networks will be required in the not-too-distant future to support them. The design of 802.11ad devices also provided important insights into the feasibility and practical issues of integrating millimeter-wave in consumer devices.

With the first millimeter-wave 5G deployments under way, we are now at the very important point where researchers gain insights into the real-world problems and performance of operational millimeter-wave mobile networks. As a consequence, it is very important to carry out measurement studies and ideally make the data available to other researchers. An additional discussion point were testbeds, where at a number of universities and research labs powerful millimeter-wave prototypes are being developed. Given the complexity and effort such designs require, it would be highly desirable to converge on one or more “standard” millimeter-wave platforms for the research community to use and extend (similar to what has happened with USRP/GnuRadio and WARP for 802.11).



Figure 6: The agenda (episode 2)

Two major challenges remain for the practical deployment of mmWave networks. The first is how to realize pervasive coverage at low deployment cost. Due to the relatively short coverage of mmWave base stations, the network needs to be ultra-dense, which in turn entails huge capital and operational costs. The second is how to best coordinate the higher layer network protocols with the mmWave PHY layer, so as to maximize the end-to-end network throughput. The highly dynamic mmWave channel may disturb the adaptation mechanisms of higher layer protocols such as TCP and real-time video delivery, which reduces the utilization of channel capacity.

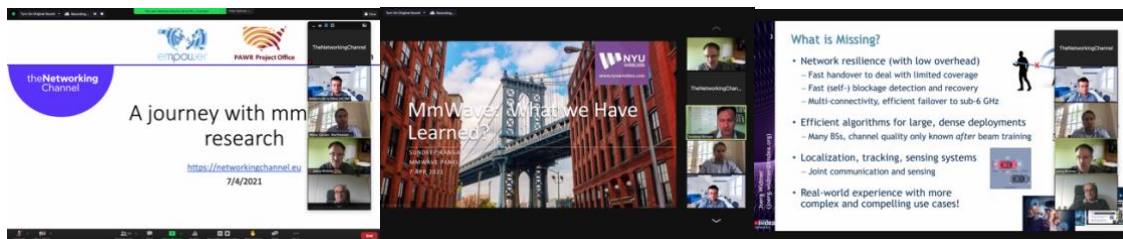


Figure 7: Moments of episode 2

The statistics of the episode are shown below:

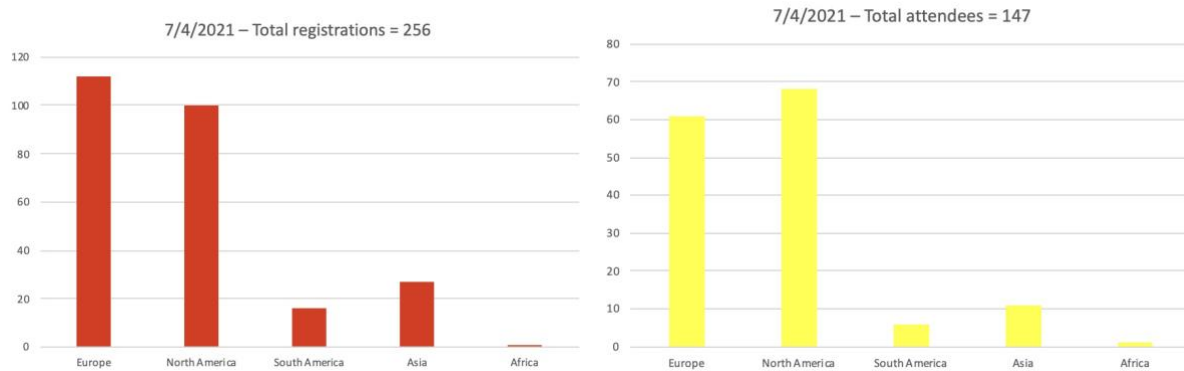


Figure 8: The statistics of Episode 2 (a) – the registrations per region (b) the attendees per region

### 2.1.3 [Episode 3 - 5G and Next G Innovation Opportunities and Challenges: Enabled by Disaggregation, SDN and Open Source](#)

The event organised on 21/4/2022 by Manu Gosain – Senior Technical Program Director for PAWR. The discussion panel included:

- *Guru Parulkar – Executive Director of Open Networking Foundation (ONF) and Executive Director of Stanford Platform Lab;*
- *Sachin Katti – Assistant Professor of Electrical Engineering and Computer Science at Stanford University, Co-Chair of O-RAN Alliance;*
- *Christian Maciocco – Principal Engineer and Director Telecom Systems Research, Intel Labs;*
- *Florian Kaltenberger – EURECOM.*



Figure 9: TheNetworkingChannel webpage (episode 3)

In this panel, we presented with concrete examples how 5G networks are embracing SDN, disaggregation and open source and thus represent opportunities for researchers to contribute and shape the future of mobile cellular networks. It is now possible to program the control plane and the forwarding pipeline of RAN, mobile core, and front-haul, back-haul, and backbone networks on servers, NICs, switches and middle-boxes. The panel presented a network architecture blueprint to set up a private 5G network leveraging CBRS spectrum with end to end softwarized network/RAN elements to further innovate on. This represents a really exciting and unprecedented opportunity for the research community. The panel also shined a light on technical challenges that a researcher has to be prepared for: learn the latest software development tools and practices and to be able to work with real systems to have an impact on the evolution of 5G towards next G and beyond.



Figure 10: The agenda (episode 3)

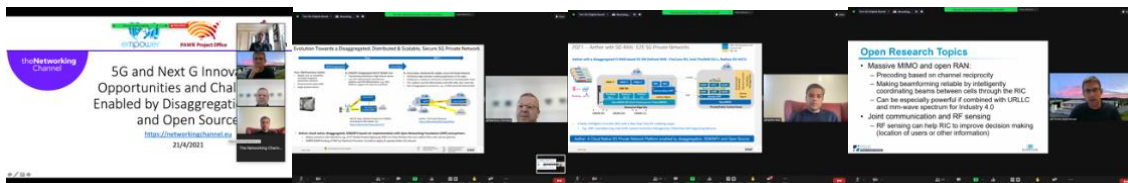


Figure 11: Moments of episode 3

The statistics of the episode are shown below:

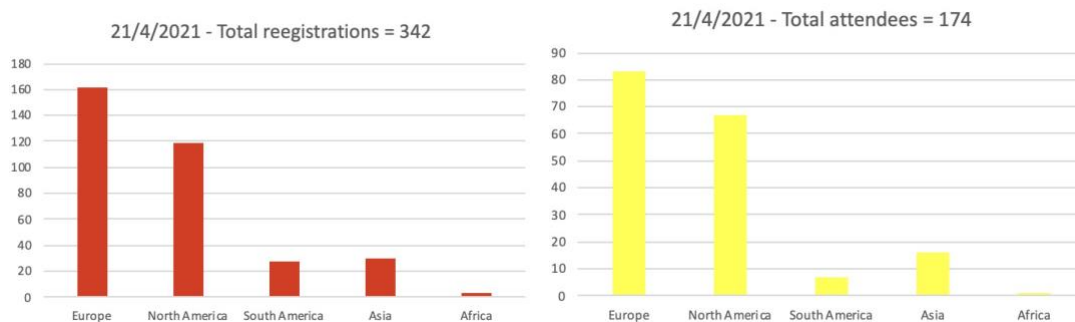


Figure 12: The statistics of Episode 3 (a) – the registrations per region (b) the attendees per region

#### 2.1.4 [Episode 4 - Advice on how to succeed in grad school](#)

The event organised on 5/5/2021 by Matt Caesar – Professor in the Department of Computer Science at University of Illinois. The panel of experts included:

- *Jennifer Rexford – Professor of the Computer Science Department at Princeton University;*

- *Edmundo de Souza e Silva – Federal University of Rio De Janeiro, Brazil;*
- *David Patterson – Berkeley, USA;*
- *Anja Feldmann – Max Planck Institute for Informatics.*

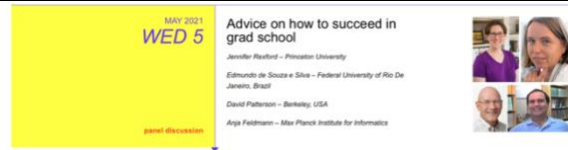


Figure 13: TheNetworkingChannel webpage (episode 4)

With a panel of graduate student discussants from around the world:

- *Lin Chen – The Hong Kong University of Science and Technology;*
- *Sanaullah Manzoor – Information Technology University, Pakistan;*
- *Wael Fateh – University of Prince Mugrin, Saudi Arabia;*
- *Mary Hogan – Princeton, USA;*
- *Amanda Hsu – University of Illinois at Urbana-Champaign, USA;*
- *Saffana Mohammed – University of Prince Mugrin, Saudi Arabia.*

Graduate school can be a very different experience than undergrad: students are often exposed for the first time to independent research, publishing, giving talks and attending conferences, and much more. As such, the set of skills and efforts needed to succeed in graduate school can be quite different as well. In this panel, a team of world-renowned educators will give advice on how students can succeed in graduate school.



Figure 14: The agenda (episode 4)



Figure 15: Moments of episode 4

The statistics of the episode are shown below:

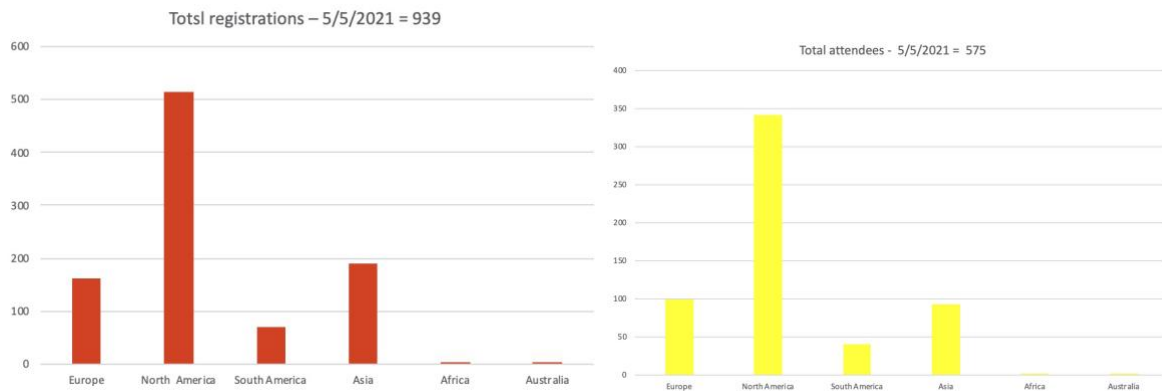


Figure 16: The statistics of Episode 4 (a) – the registrations per region (b) the attendees per region



### 2.1.5 [Episode 5 - Emerging Trends in AI/ML and Implications for Networking Research](#)

The event organised on 19/5/2021 by Abhimanyu Gosain – Northeastern University. The panel consisted by:

- *Dr Sujata Banerjee – Sr. Director of Research, VMware, USA;*
- *Dr. Somdeb Majumdar – Intel’s AI Lab, USA*
- *Dr Dario Rossi – Huawei, France;*
- *Dr Dan Pei – Tsinghua University, China.*



Figure 17: TheNetworkingChannel webpage (episode 5)

The event moderated by Dr Nageen Himayat – Principal Engineer, Intel Labs.



Figure 18: The agenda (episode 5)

Machine Learning (ML) and Artificial Intelligence techniques promise new design methodologies and tools for architecting communication networks and automating network operation. At the same time, the increasingly powerful and ubiquitous compute-communication capabilities of emerging networks, are driving AI/ML computations closer to the edge; a shift that promises to democratize AI services and enable a wide variety of new AI usages.

AI/ML technology continues to evolve at a rapid pace, moving from a paradigm of supervised learning towards distributed self-learning, cognitive reasoning and general intelligence. Although AI models are becoming

increasingly powerful, several challenges in wide-scale deployment of AI/ML solution have been identified. They include growing computational complexity and power consumption of AI/ML models, access to sufficient real-world data to drive AI/ML research, robustness of learning solutions in practical deployments, susceptibility to adversarial attacks, and lack of explainability of AI models.

Exploiting the power of AI/ML solutions to address the growing complexity of communication networks, while addressing the aforementioned challenges in the context of resource constrained, dynamic and mission critical environment of modern networks is an important topic of current research. This panel highlighted the emerging trends in AI/ML technology and discuss their implications for design, deployment and operation of next generation communication networks.



Figure 19: Moments of episode 5

The statistics of the episode are shown below:

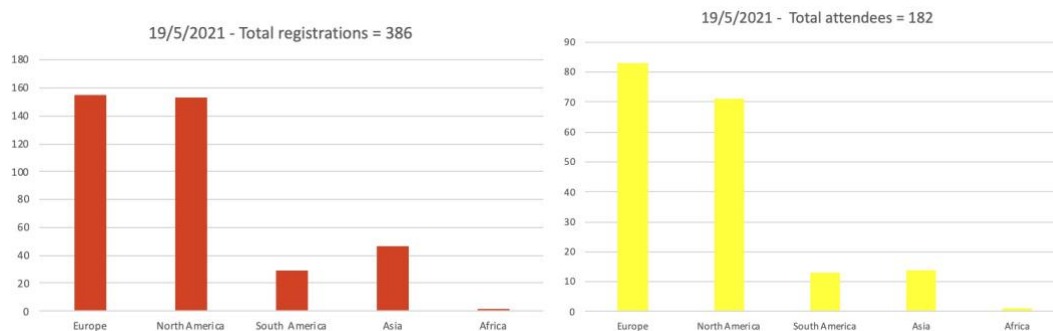


Figure 20: The statistics of Episode 5 (a) – the registrations per region (b) the attendees per region

### 2.1.6 [Episode 6 - Challenges at Layer 8: Network neutrality, the digital divide and spectrum](#)

The event organised on 26/2021 by Henning Schulzrinne – Julian Clarence Levi Professor of Mathematical Methods and Computer Science and Professor of Electrical Engineering, Columbia University. The panel consisted by:

- *Scott Marcus – Senior Fellow at Bruegel, Belgium;*
- *Eric Burger – Professor of Computer Science, Georgetown University, USA;*
- *Chris Marsden – Professor of Internet Law, University of Sussex, UK;*
- *Sonia Jorge – Executive Director, A4AI, Head of Digital Inclusion, Web Foundation;*
- *Paul Brooks – Consulting CTO and Chair of Internet Australia, Australia.*

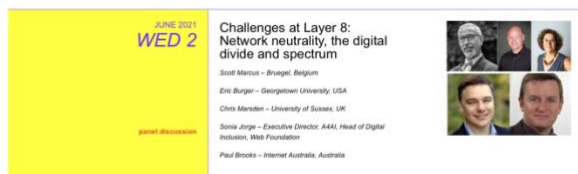


Figure 21: TheNetworkingChannel webpage (episode 6)

As the internet has become critical infrastructure and indispensable, policy makers in many countries are struggling with the same questions: What should be the regulatory obligations of telecommunications carriers?

How can we ensure that rural areas and low-income households have access to the internet? And how can we manage scarce spectrum to enable new services, increase competition and protect vital existing services? While each of these issues is hard, they are also interdependent.



Figure 22: The agenda (episode 6)

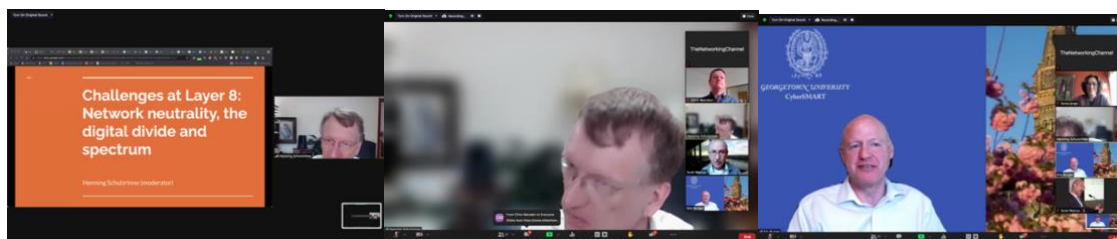


Figure 23: Moments of episode 6

The statistics of the episode are shown below:

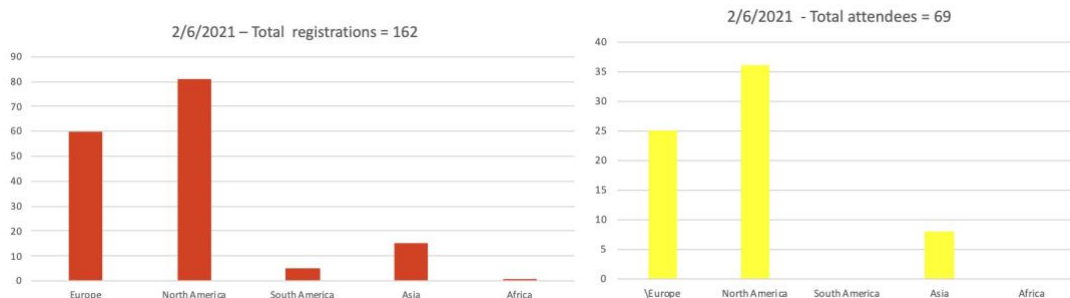


Figure 24: The statistics of Episode 6 (a) – the registrations per region (b) the attendees per region

### 2.1.7 [Episode 7 - Google Networking: Infrastructure and Selected Challenges](#)

The event organised on 19/5/2021 by Matt Caesar – Professor in the Department of Computer Science at University of Illinois and Jim Kurose – Professor of College of Information and Computer Sciences at the University of Massachusetts Amherst. The panel consisted by:

- *Christophe Diot* – Principal Engineer at Network Operations team, Google;
- *Paulie Germano* – Senior Staff Network Engineer, Google.

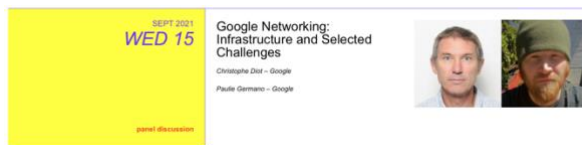


Figure 25: TheNetworkingChannel webpage (episode 7)

Google has deployed one of the largest network infrastructures worldwide connecting tens of data centers to billions of users worldwide with a large diversity of workloads (e.g. youtube, search, maps, photos, mobile). In many cases, Google had to create and implement new technologies to deploy and manage its network as there was no other infrastructure with such a scale in industry. This explains why GOOGLE has pioneered many technologies, as with e.g. Data Center architecture, SDN networks, and computing models. We presented the GOOGLE network infrastructure, how it was designed and why. We identified some research challenges for our data centers and networks.



Figure 26: The agenda (episode 7)

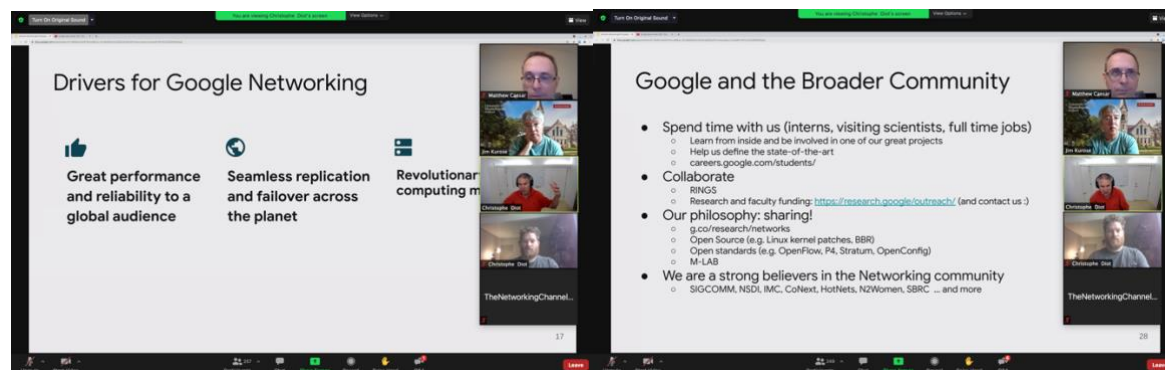


Figure 27: Moments of episode 7

The statistics of the episode are shown below:

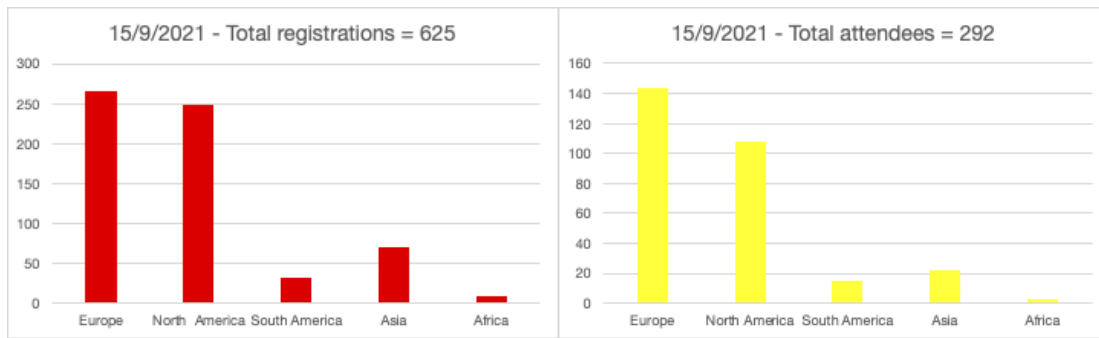


Figure 28: The statistics of Episode 7 (a) – the registrations per region (b) the attendees per region

### 2.1.8 [Episode 8 - Demonstrating Advanced 5G and Edge Services on the 5G-VINNI platform](#)

The event organised as a site visit on 29/9/2021 as the first event of season 2 by Per Hjalmar Lehne – Senior Researcher at Telenor ASA. The 5G-VINNI team consisted by:

- *Andrés Gonzalez – Senior Researcher, Telenor Research, Norway;*
- *Johan Morten Tetlie – Solution Architect, Ericsson Norway;*
- *Antonios Dimitriadis – Lead Telco Cloud Infrastructure and Automation Solution Architect, Nokia;*
- *Tirthankar Ghosh – Solution Architect, Service Orchestration, Nokia;*
- *Kennet Nomeland – Radio System Architect, Norwegian Defence Material Agency.*



Figure 29: TheNetworkingChannel webpage (episode 8)

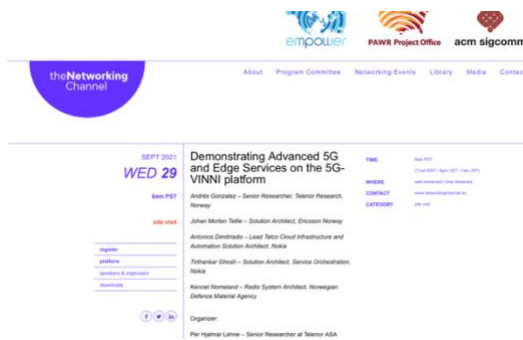


Figure 30: The agenda (episode 8)

The 5G-VINNI Norway Facility is a real operational 5G Network in Norway, where important 5G features such as automation, security and cloud flexibility have been tested in advance. One of the key advantages of the 5G-VINNI Norway facility is the cooperation with important verticals such as hospitals, and public safety institutions, enabling the implementation of novel and useful use cases using 5G. This presentation is based on 3 pillars. First, the presentation of some of the key 5G Network components implemented. Second, the successfully applied automation routines that can be achieved with 5G. Finally, concrete demos that have demonstrated the advantages of 5G in public safety scenarios, presented directly by representatives from the Norwegian Armed Forces.

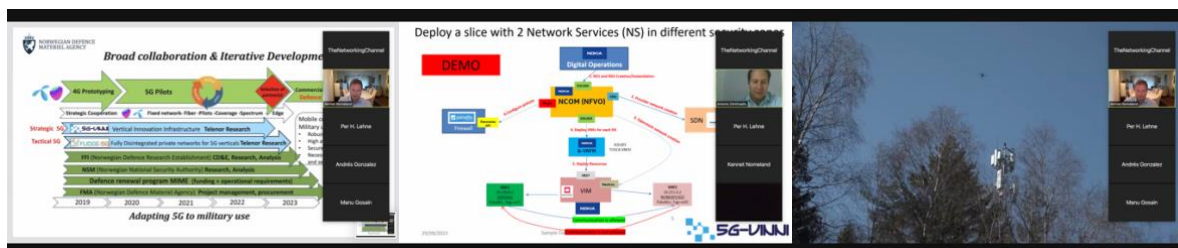


Figure 31: Moments of episode 8



The statistics of the episode are shown below:

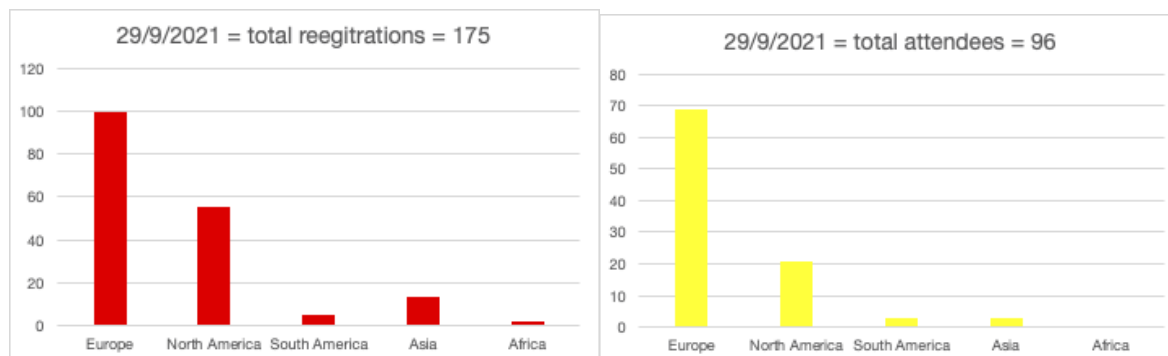


Figure 32: The statistics of Episode 8 (a) – the registrations per region (b) the attendees per region

### 2.1.9 [Episode 9 - Networking Education During and After the Pandemic](#)

The event organised on 13/10/2021 by Matt Caesar – Professor in the Department of Computer Science at University of Illinois. The panel consisted by:

- *Bamba Gueye – Université Cheikh Anta Diop, Senegal;*
- *Jörg Liebeherr – University of Toronto, Canada;*
- *Koojana Kuladinithi – Hamburg University of Technology, Germany;*
- *Luciano Paschoal Gasparly – Federal University of Rio Grande do Sul;*
- *Prométhée Spathis – Sorbonne Université, France.*

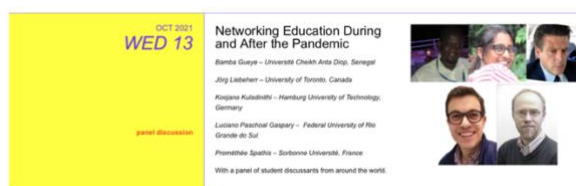


Figure 33: TheNetworkingChannel webpage (episode 9)

With a panel of student discussants from around the world.

- Francisco Pereira – Portugal;
- Jessica Quaye – USA;
- Coralie Busse-Grawitz – Switzerland;
- Anusheh Zohair Mustafeez – Pakistan;
- Alexa Darce – Germany;
- Vien Vuong – USA;
- Michael Chen – USA.



Figure 34: The agenda (episode 9)

The COVID-19 pandemic resulted in a massive and unprecedented switch from in-person to online teaching at colleges and universities across the world. Since then, there has been tremendous innovation to not only cope, but to thrive, with online and hybrid teaching. As we contemplate a possible return to in-person teaching, there may be resources, knowledge, and ideas that may help us bring the lessons we learned from the pandemic back to the classroom. In this panel, a global team of networking educators discussed lessons learned and experiences, with eye towards what lies ahead.

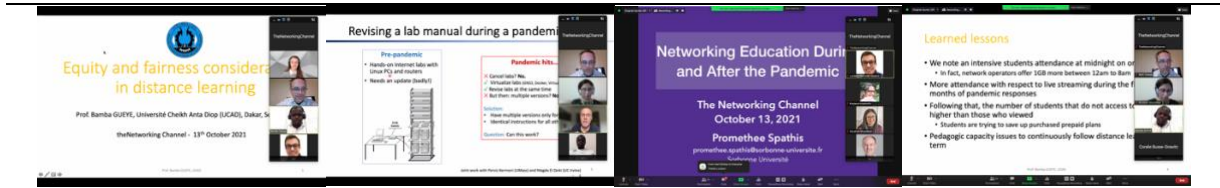


Figure 35: Moments of episode 9

The statistics of the episode are shown below:

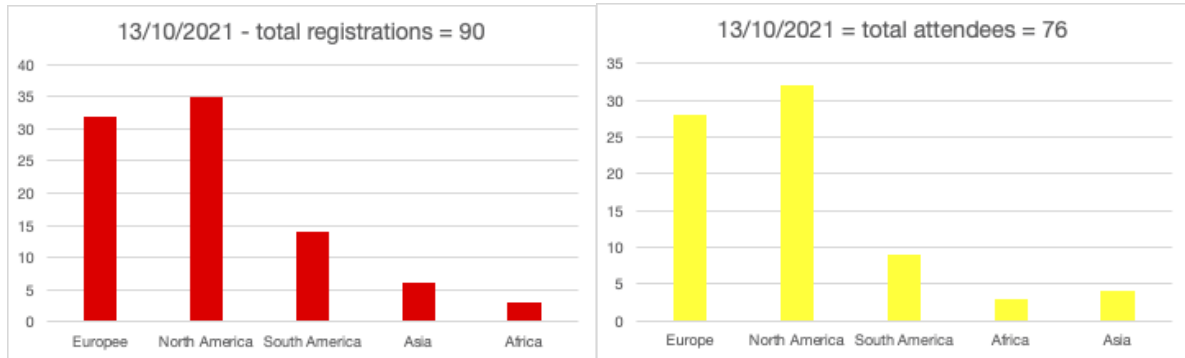


Figure 36: The statistics of Episode 9 (a) – the registrations per region (b) the attendees per region

### 2.1.10 Episode 10 - Experiments in the Edge to Cloud Continuum

The event organised on 27/10/2021 by Serge Fdida – Sorbonne Université. The panel consisted from:

- Kate Keahey – University of Chicago;
- Jason Anderson – University of Chicago.



Figure 37: TheNetworkingChannel webpage (episode 10)

The increasing popularity of IoT devices allows us to communicate better, interact better, and ultimately build a new type of a scientific instrument that will allow us to explore our environment in ways that we could only dream about just a few years ago. This disruptive opportunity raises a new set of challenges: How should we manage the massive amounts of data and network traffic such instruments will eventually produce? What types of environments will be most suited to developing their full potential? What new security problems will arise? And finally: what are the best ways of leveraging intelligent edge to create new types of applications?



Figure 38: The agenda (episode 10)

In a research area that creates a new deployment structure, such questions are too often approached only theoretically for lack of a realistic testbed: a scientific instrument that keeps pace with the emergent requirements and allows researchers to deploy, measure, and study relevant scientific phenomena. To help create

such instrument, the NSF-funded Chameleon testbed, originally created to provide a platform for datacenter research, has now been extended to support experiments in cloud to edge.

In this presentation, we first briefly described the Chameleon testbed and then explained how it was extended to support edge to cloud experiments. We introduced CHI@Edge, an extension to CHameleon Infrastructure (CHI), gave a demonstration of how users can easily create an experiment spanning edge devices and significant

cloud resources from one Jupyter notebook, and gave examples of edge to cloud projects in research and education projects that our users created.



Figure 39: Moments of episode 10

The statistics of the episode are shown below:

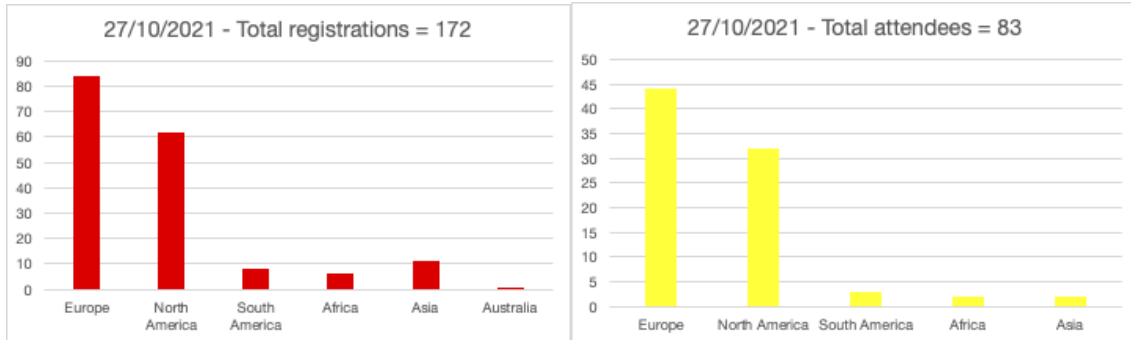


Figure 40: The statistics of Episode 10 (a) – the registrations per region (b) the attendees per region

### 2.1.11 [Episode 11 – A day in the life of Netflix Streaming: A conversation about Netflix Adaptive Streaming and more](#)

The event organised on 10/11/2021 by Jim Kurose – Professor of College of Information and Computer Sciences at the University of Massachusetts Amherst, with a panel of:

- e-Yuan Huang– Streaming Algorithm team, Netflix;
- Renata Teixeira – Streaming Algorithms team, Netflix.



Figure 41: TheNetworkingChannel webpage (episode 11)

“Why are we talking about video streaming in a networking channel?” The truth is, the Internet today is mostly video. It’s the majority of traffic in all regions around the world, and on all types of networks. Any networking researcher who wants to understand the Internet today needs to understand video streaming. In this chat, we walked you through a day in the life of Netflix streaming, from encoding technology to content distribution and adaptive streaming. It’s a highly interdisciplinary topic, and there is still much to be learned.



Figure 42: The agenda (episode 11)

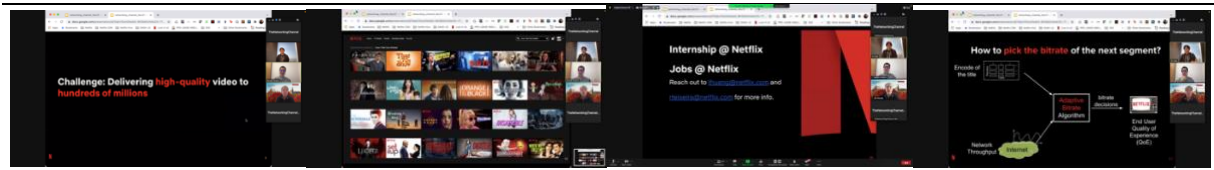


Figure 43: Moments of episode 11

The statistics of the episode are shown below:

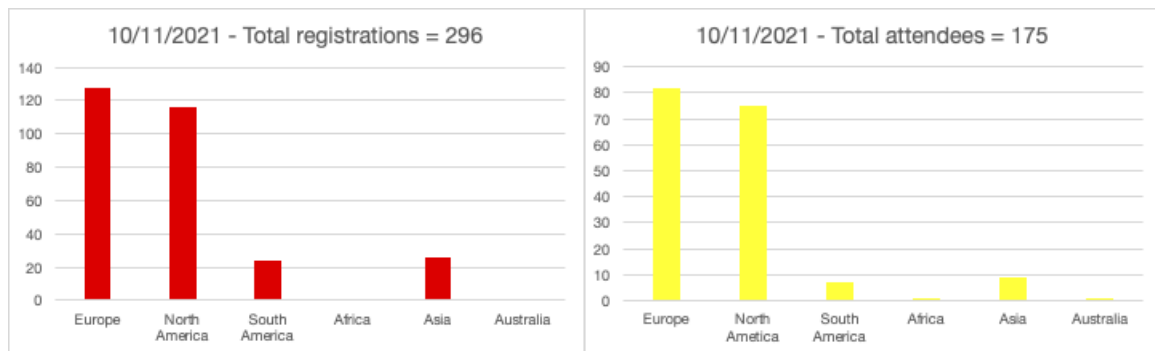


Figure 44: The statistics of Episode 11 (a) – the registrations per region (b) the attendees per region

### 2.1.12 [Episode 12 - Quantum Networks](#)

The event organised on 24/11/2021 Serge Fdida – Sorbonne Université with a panel of:

- Frédéric Grosshans – Sorbonne Université;
- Rodney Van Meter – Keio University;
- Donald F. Towsley – University of Massachusetts Amherst.

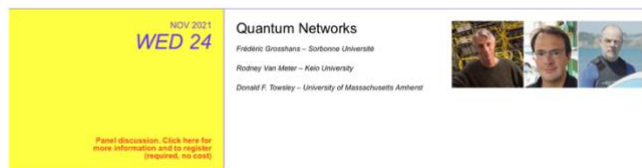


Figure 45: TheNetworkingChannel webpage (episode 12)

Quantum technologies, and among them computing and quantum communications, are starting to come out of research laboratories and will likely have an increasing impact over information technologies during the next decades. Initially, “networks” aspects of this research were limited to point to point communications, but they have now extended to truly networked systems, ranging from actually deployed quantum key distribution (QKD) networks to the development of hardware, network protocols for a future quantum internet connecting several quantum computers, as well as an exploration of potential applications.



Figure 46: The agenda (episode 12)

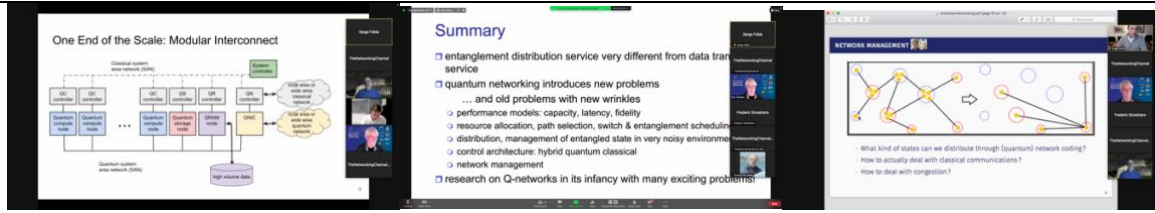


Figure 47: Moments of episode 12

The statistics of the episode are shown below:

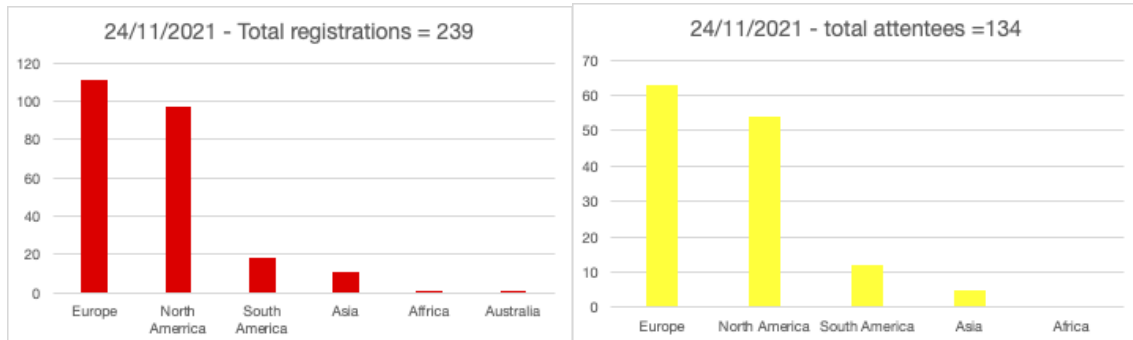


Figure 48: The statistics of Episode 12 (a) – the registrations per region (b) the attendees per region

### 2.1.13 [Episode 13 - Human-centered Networking](#)

The event organised on 8/12/2021 by Jim Kurose – Professor of College of Information and Computer Sciences at the University of Massachusetts Amherst and Matt Caesar – Professor in the Department of Computer Science at University of Illinois. Keynote speech delivered by:

- Ellen Zegura – Georgia Tech.

With a panel of discussants:

- Elizabeth M. Belding – College of Engineering; University of California, Santa Barbara;
- Kurtis Heimerl – University of Washington;
- Aaditeshwar Seth – Indian Institute of Technology Delhi
- Srinivasan Keshav – University of Cambridge.



Figure 49: TheNetworkingChannel webpage (episode 13)

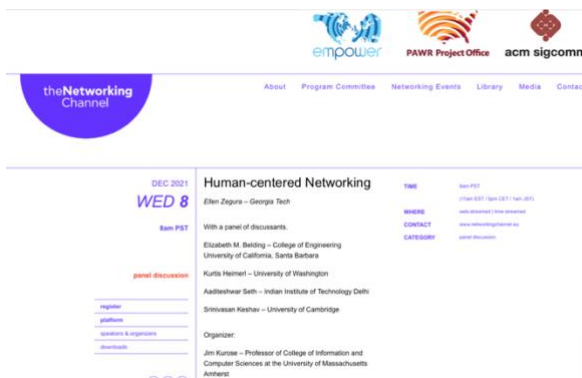


Figure 50: The agenda (episode 13)

Engineers and computer scientists often isolate technical problems away from the human and societal context in which they exist. In this panel we heard from experts in the intersection of networking and people about interesting problems, notable accomplishments, and methods needed to work in this interdisciplinary space.





Figure 51: Moments of episode 13

The statistics of the episode are shown below:

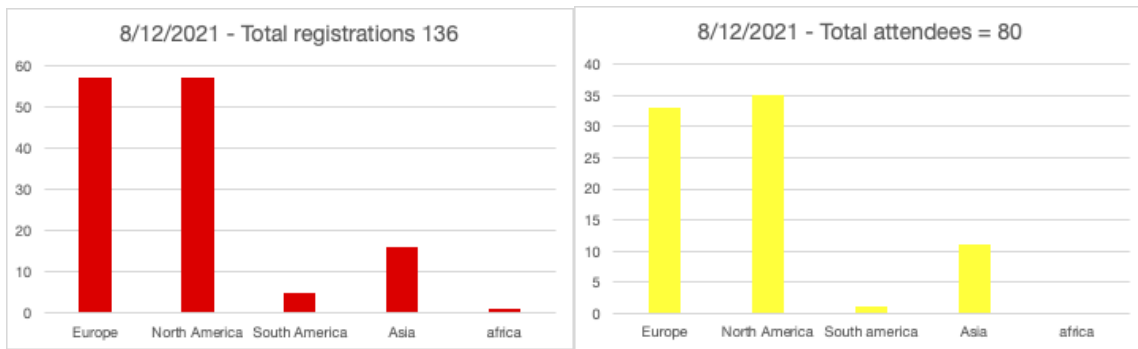


Figure 52: The statistics of Episode 13 (a) – the registrations per region (b) the attendees per region

### 2.1.14 Episode 14 - QUIC and its impact on secured transport layer management in SATCOM systems

The event organised on 19/1/2021 by Nicolas Kuhn – Project Manager Technical Lead at Centre National d’Études Spatiales, France with a panel of discussants:

- Christian Huitema – Private Octopus Inc;
- Emile Stephan – Orange Labs, France;
- Alexandre Ferrieux – Orange Labs, France;
- Isabelle Hamchaoui – Orange Labs, France;
- John Border – Hughes Network Systems;
- Chi-Jiun Su – Hughes Network Systems;
- Marie-José Montpetit – Telecom Paris Sud.



Figure 53: TheNetworkingChannel webpage (episode 14)



Figure 54: The Agenda (episode 14)

QUIC was measured as taking a significant part of the volume transmitted in broadband access, in particular because of the players implementing it, such as Google or Facebook. QUIC hides the packet transport headers and therefore impacts the classical in-network operations that are deployed to adapt the congestion control in specific contexts or manage the networks. More generally, this seminar discussed the impacts of the deployment of secured transport layer protocols on in-network operations and on end user experience in SATCOM systems.

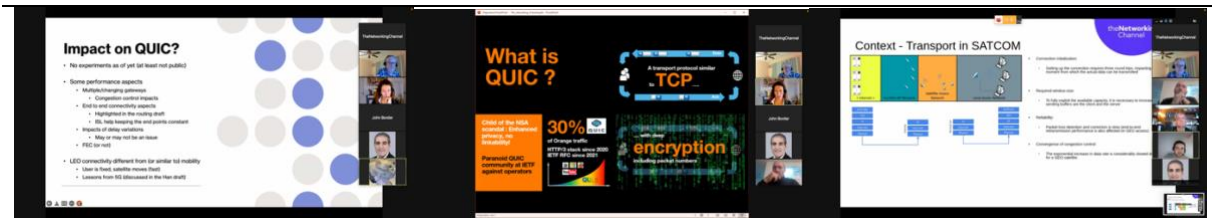


Figure 55: Moments of episode 14

The statistics of the episode are shown below:

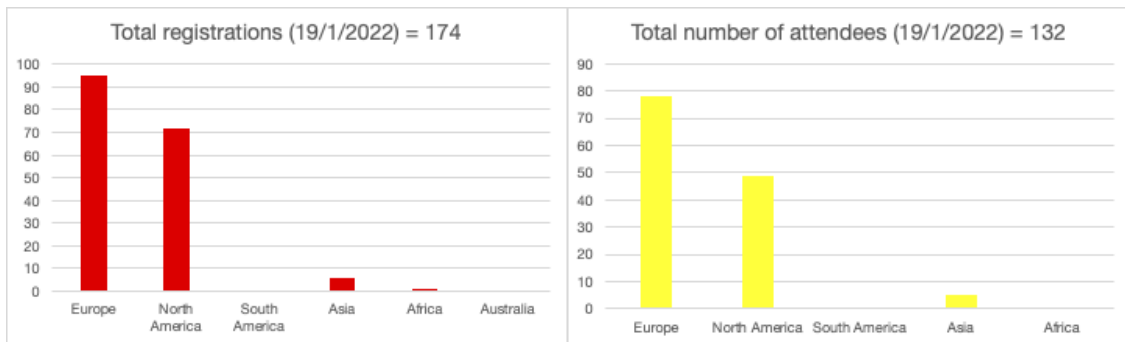


Figure 56: The statistics of Episode 14 (a) – the registrations per region (b) the attendees per region

### 2.1.15 [Episode 15 - How can we improve diversity and inclusion in the systems and networking community?](#)

The event organised on 2/2/2022 by Jim Kurose – Professor of College of Information and Computer Sciences at the University of Massachusetts Amherst and Matt Caesar – Professor in the Department of Computer Science at University of Illinois with a panel of discussants:

- Margaret Martonosi – National Science Foundation, USA;
- Tracy Camp – Colorado School of Mines, USA
- Mythili Vutukuru – IIT Bombay, India;
- Ahmed Elmokashfi – Simula Research Laboratory, Norway;
- Craig Partridge – Colorado State University, USA;
- Manuel Perez Quinones – University of North Carolina at Charlotte, USA.



Figure 57: TheNetworkingChannel webpage (episode 15)

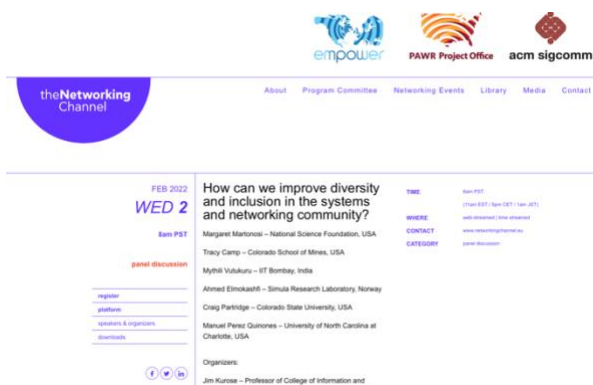


Figure 58: The agenda (episode 15)

Many of us would agree with the importance of diversity and inclusion, but oftentimes the path to achieve those goals is not so clear. In this panel, we had a conversation on how we can improve diversity and inclusion within the systems and networking community. Our goal was to both foster awareness of concerns that have been voiced within our community, as well as to propose ideas attendees can bring back to their home institutions to improve equity and inclusion in their daily work.



Figure 59: Moments of episode 15

The statistics of the episode are shown below

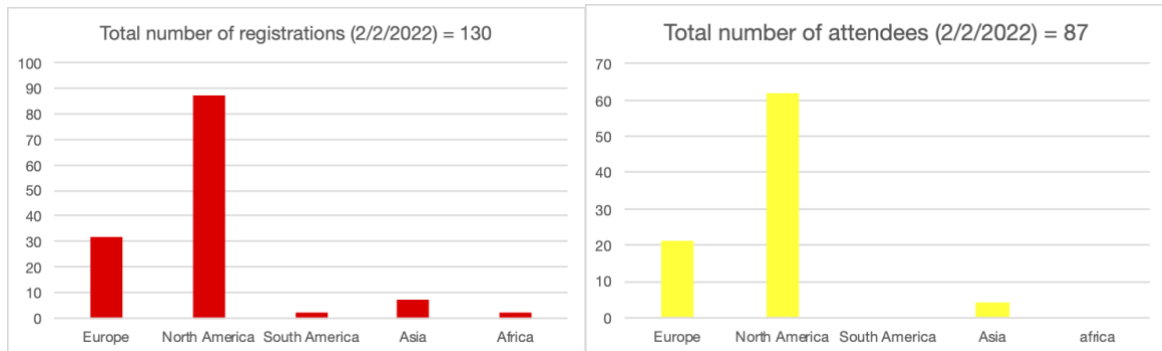


Figure 60: The statistics of Episode 15 (a) – the registrations per region (b) the attendees per region

**2.1.16 Episode 16 - How the Internet grew up outside the US, and lessons learned for the future**

The event organised on 16/2/2022 by Jim Kurose – Professor of College of Information and Computer Sciences at the University of Massachusetts Amherst and Matt Caesar – Professor in the Department of Computer Science at University of Illinois with a panel of:

- Kanchana Kanchanasut – Asian Institute of Technology, Thailand;
- Randy Bush – IJ Research, Japan & Arrcus Inc, USA;
- Edmundo de Souza e Silva – Federal University of Rio De Janeiro, Brazil.



Figure 61: TheNetworkingChannel webpage (episode 16)



Figure 62: The agenda (episode 16)

There is much written about how the Internet evolved in United States, but less is known about the history of the Internet’s deployment and evolution in other countries. In this panel, we heard about how the Internet became introduced into Africa, Southeast Asia, and South America. The panelists recounted the history of these efforts and give a sense of the unique challenges and opportunities of deploying in these regions. The panelists also described lessons learned from these early days, and how those lessons learned might inform various aspects of how things will/should/could evolve in the future.



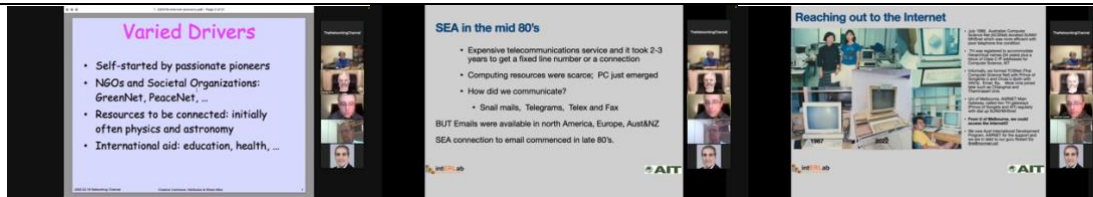


Figure 63: Moments of episode 16

The statistics of the episode are shown below:

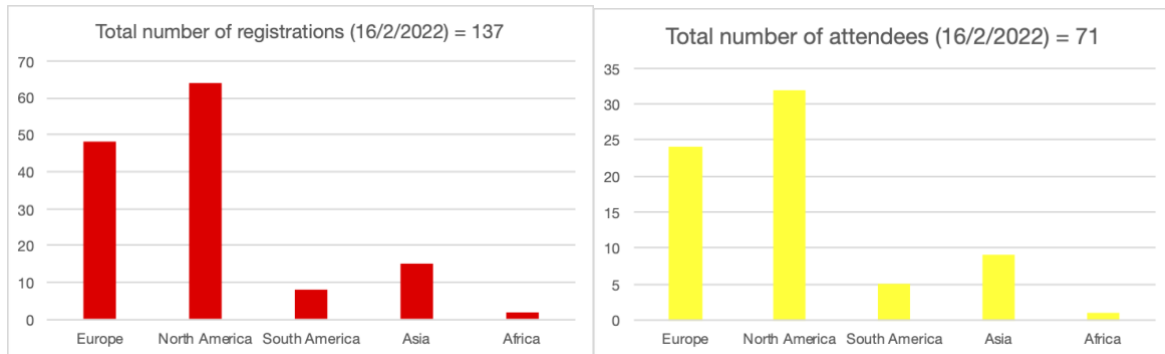


Figure 64: The statistics of Episode 16 (a) – the registrations per region (b) the attendees per region

### 2.1.17 [Episode 17 - Transatlantic perspectives on 6G Vision, Roadmap and Development Model](#)

The event organised on 2/3/2022 Serge Fida – Sorbonne Université with a panel of:

- David Boswarthick – Director of New Technologies, ETSI;
- Mikko Uusitalo – Head of Research Department Wireless Advanced Technologies, Nokia Bell Labs, Finland;
- Douglas Castor – Senior Director, InterDigital Research and Innovation for 6G.



Figure 65: TheNetworkingChannel webpage (episode 17)

The event moderated by Alain Mourad – InterDigital Europe, EMPOWER Roadmap Lead.

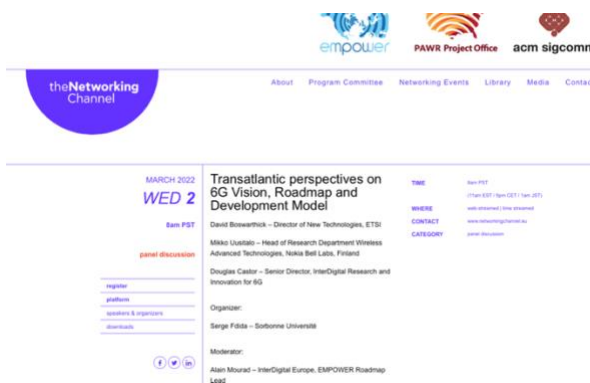


Figure 66: The agenda (episode 17)

Upon issuing its recommendations for IMT-2020 in early 2021, the ITU-R didn't wait to kick start an effort on IMT-2030 (a.k.a. 6G) vision and future technology trends with the aim to issue a report by the Summer 2022. All global and regional stakeholders into 6G have been developing their visions and roadmaps and contributing inputs into this activity at ITU-R. While the consolidation of the inputs is taking place, this is clearly emerging a global consensus on the services envisioned, target capabilities and technology trends. This webinar reviewed the 6G visions, roadmaps and related activities at ETSI, in the H2020 6G flagship HEXA-X project and the EMPOWER project, and at the ATIS Next Generation Alliance, and discussed opportunities for transatlantic alignment and collaboration on 6G.



Figure 67: Moments of episode 17

The statistics of the episode are shown below:

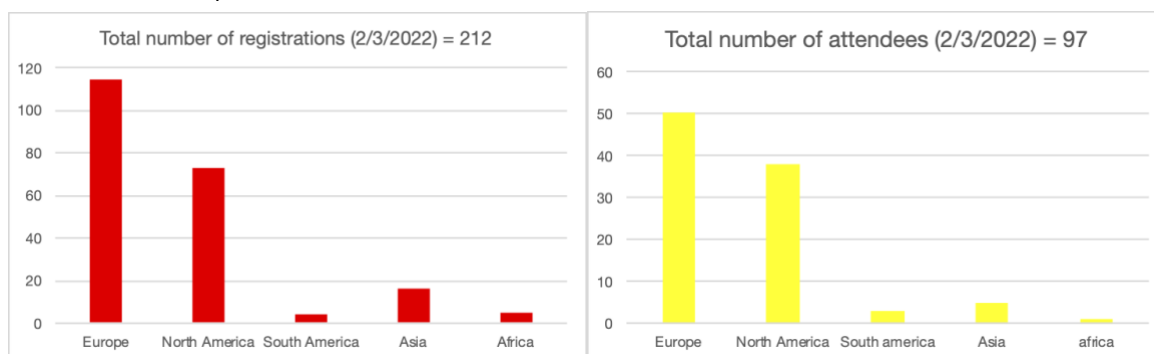


Figure 68: The statistics of Episode 17 (a) – the registrations per region (b) the attendees per region

### 2.1.18 [Episode 18 - Open Educational resources for teaching and learning networking](#)

The event organised on 16/3/2022 by Jim Kurose – Professor of College of Information and Computer Sciences at the University of Massachusetts Amherst and Matt Caesar – Professor in the Department of Computer Science at University of Illinois with the participation of:

- Larry Peterson – Princeton University, Systems Approach LLC, Open Networking Foundation.

Plus 2-minute (each) lighting presentations by community members who are making their networking-education-related open resources available from:

- Fraida Fund – Research Assistant Professor, Electrical and Computer Engineering, NYU Tandon School of Engineering;
- Laurent Vanbever – Associate Professor at ETH Zürich;
- Damu Ding – Postdoctoral research assistant, University of Oxford ;
- Olivier Bonaventure – Professor of Computer Science, Université catholique de Louvain ;
- Christian Esteve Rothenberg – Associate Professor at University of Campinas;
- Kameswari Chebrolu – Associate Professor Computer Science & Engineering, Indian Institute of Technology, Bombay;
- Nate Foster – Professor Computer Science Cornell University;
- Ryan Doenges – Ph.D. student at Cornell University;
- Pieter-Tjerk de Boer – Associate professor, University of Twente, The Netherlands.

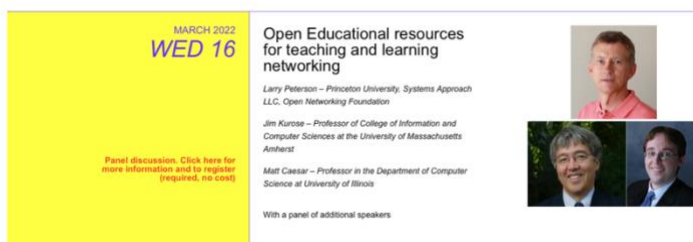


Figure 69: TheNetworkingChannel webpage (episode 18)

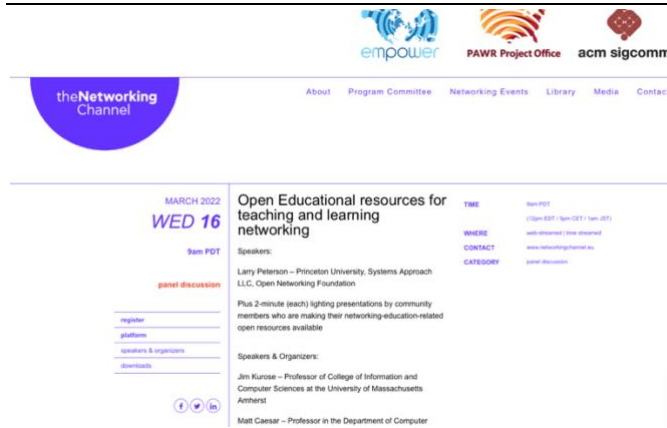


Figure 70: The agenda (episode 18)

In the first part of this event, Matt Caesar, Larry Peterson and Jim Kurose engaged in a “fireside chat” about open educational resources for teaching and learning networking including Larry’s work (with Bruce Davie and others) on the Systems Approach Book Series, SIGCOMM’s new educational resources website, and Jim’s work (with Keith Ross) on developing open networking educational resources. In the second part of the event, community members were invited to present 2-minute (each) lightning presentations on networking-education-related open resources they are making available.



Figure 71: Moments of episode 18

The statistics of the episode are shown below:

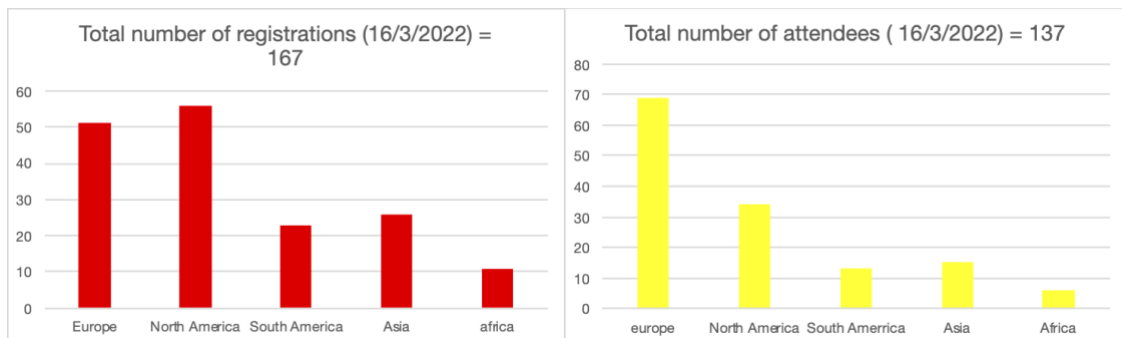


Figure 72: The statistics of Episode 18 (a) – the registrations per region (b) the attendees per region

### 2.1.19 [Episode 19 – Network Datasets: what exists, and what are the problems?](#)

The event organized on 30/3/2022 by Christophe Diot – Principal Engineer at Network Operations team, Google and Jim Kurose – Professor of College of Information and Computer Sciences at the University of Massachusetts Amherst. The panel consisted from:

- Timur Friedman – Associate Professor, Sorbonne Université – LIP6;
- Phillipa Gill – Google, USA;
- Sue B. Moon – KAIST Chair Professor, South Korea;
- Dave Clark – MIT, USA;
- Italo Cunha – UFMG, Brazil.

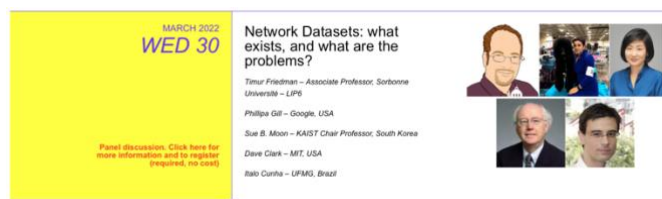


Figure 73: TheNetworkingChannel webpage (episode 19)

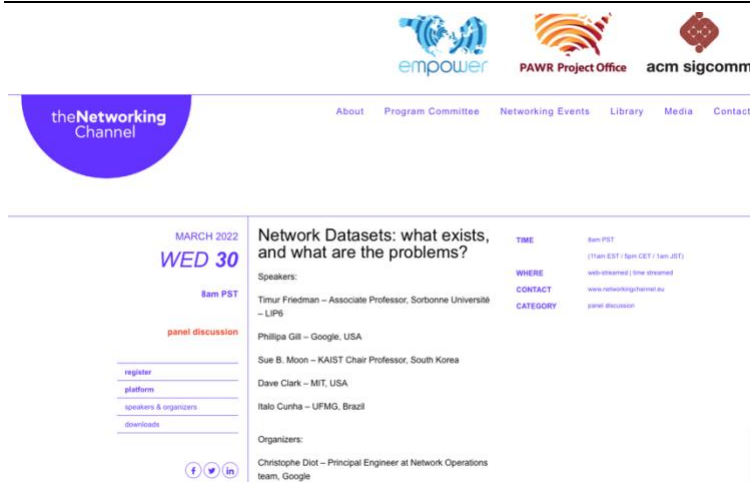


Figure 74: The agenda (episode 19)

Public datasets of network measurements have been created and made available for several decades. These datasets are of interest to networking researchers (who are interested in workloads, topologies, and other characteristics of deployed networks in/across the backbone, access, home and mobile networks), students who want to learn what “real” networks look like, policy makers, and more. This event of the NetworkingChannel had two parts. The first part, we identified and discussed public datasets of interest and their use. In the second part, we identified some of the challenges of working with such datasets (including the difficulty of

analyzing/comparing data longitudinally, the “ageing” of data) and the challenges of obtaining industry data (which may have significant commercial and proprietary value) and solutions to that challenge, such as benchmarks and workload models.



Figure 75: Moments of episode 19

The statistics of the episode are shown below:

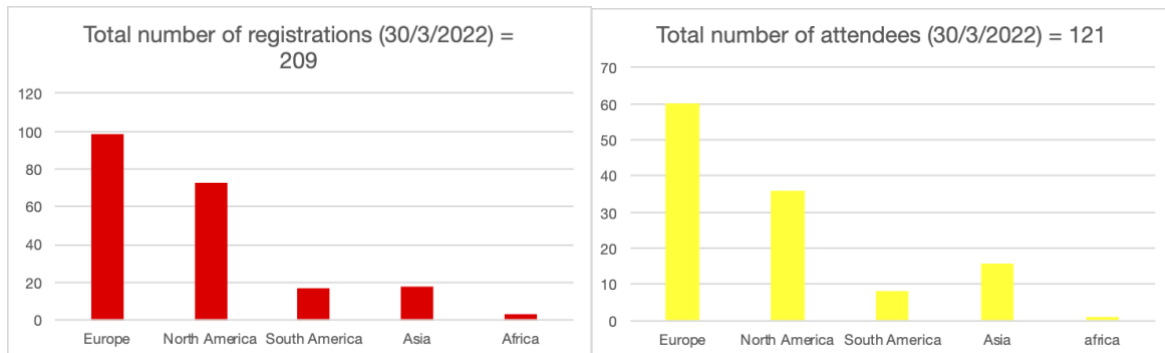


Figure 76: The statistics of Episode 19 (a) – the registrations per region (b) the attendees per region

### 2.1.20 [Episode 20 - End-to-End Network Programmability with P4](#)

The event organised on 13/4/2022 by Matt Caesar – Professor in the Department of Computer Science at University of Illinois and Jim Kurose – Professor of College of Information and Computer Sciences at the University of Massachusetts Amherst with a panel of:

- Nate Foster – Professor Computer Science, Cornell University;
- Nick McKeown – SVP/GM and Senior Fellow, Network and Edge Group at Intel, Professor at Stanford University;
- Jennifer Rexford – Professor of the Computer Science Department at Princeton University.

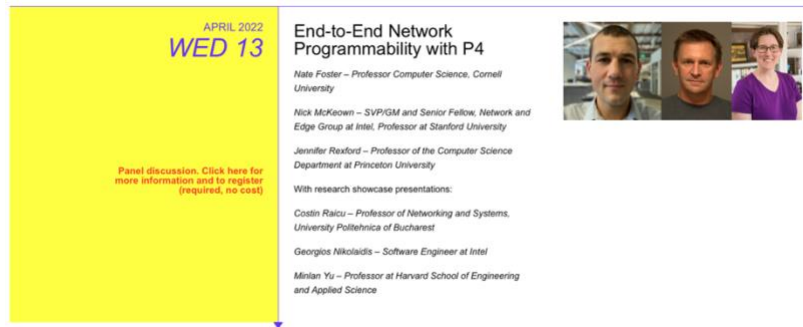


Figure 77: TheNetworkingChannel webpage (episode 20)



Figure 78: The agenda (episode 20)

With research showcase presentations:

- Costin Raicu – Professor of Networking and Systems, University Politehnica of Bucharest;
- Georgios Nikolaidis – Software Engineer at Intel;
- Minlan Yu – Professor at Harvard School of Engineering and Applied Science.

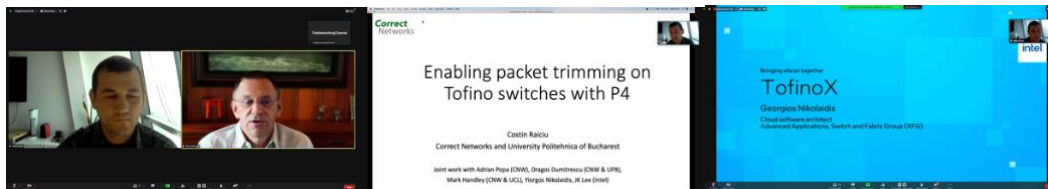


Figure 79: Moments of episode 20

The statistics of the episode are shown below:

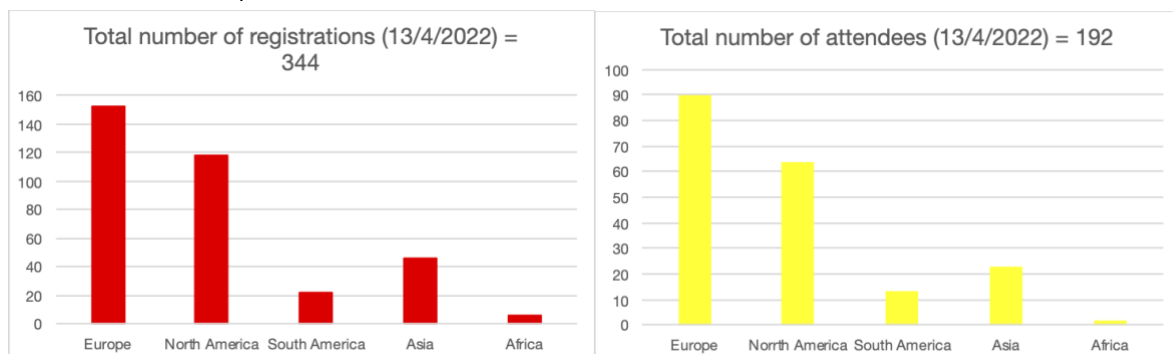


Figure 80: The statistics of Episode 20 (a) – the registrations per region (b) the attendees per region



2.1.21 Episode 21 - Magma: Current Focus and Road Ahead for 5G

The event organised on 27/4/2022 by Serge Fdida – Sorbonne Université and Raymond Knop – EURECOM

- Amar Padmanabhan – Freedomfi;
- Dr. Tien-Thinh Nguyen – EURECOM / OAI.



Figure 81: TheNetworkingChannel webpage (episode 21)

Magma began as a project to bring modern software defined networking techniques to bear on the challenges of rural Internet access. The experience building rural networks taught its founders that policy-rich network edges and simple fabrics were a broadly applicable design approach for building flexible, low-cost, and scalable networks, even outside the data center. Magma’s early design decisions reflect this core insight as well as its earliest use cases: small-scale, low-cost community networks and for coverage extension through federation with existing mobile networks.



Figure 82: The agenda (episode 21)

Every mobile network needs a high-performance packet core at the center of its network. But the market has made it impossible for MNOs, ISPs, MSOs, and Enterprises to buy, deploy and maintain the latest technologies at a reasonable cost. In order to advance Magma’s mission to connect more people with better internet, MAGMA has developed and open-sourced this market-leading Enhanced Packet Core to bring the most advanced packet core technology at the lowest Total Cost of Ownership to MNOs, ISPs, MSOs, and Enterprises that need to launch.

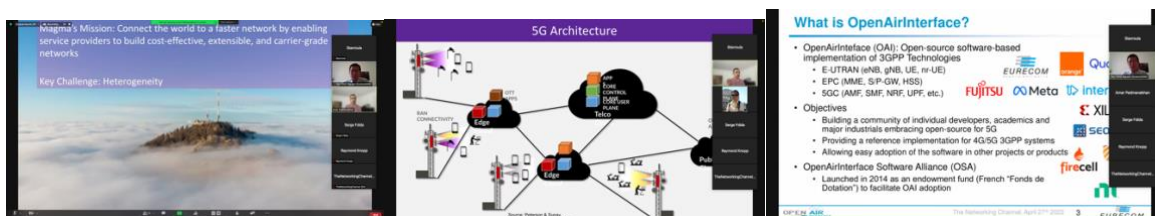


Figure 83: Moments of episode 21

The statistics of the episode are shown below:

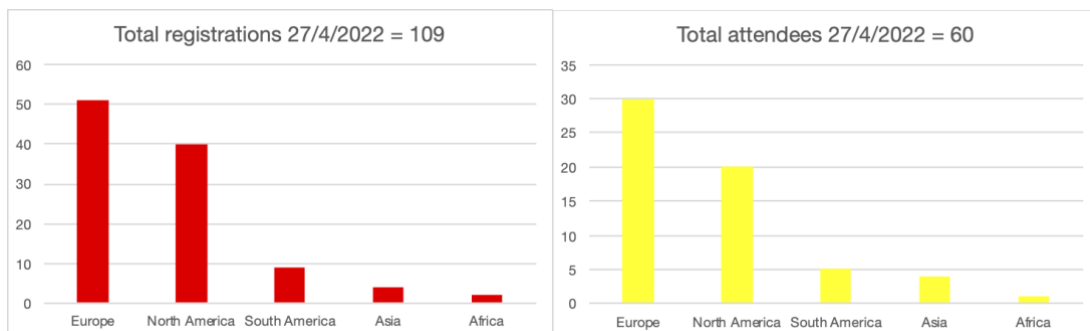


Figure 84: The statistics of Episode 21 (a) – the registrations per region (b) the attendees per region

### 2.1.22 [Episode 22 – 6G EU and US Programmes](#)

The event organised on 11/5/2022 by Prof. Serge Fdida – Sorbonne Université, EC EMPOWER Project Manager with a panel of:

- Dr. Colin Willcock – Nokia, Head of Research Alliances – 6G-IA Governing Board Chairman – Smart Networks and Services (SNS) Joint Undertaking (JU) Governing Board Chairman;
- Dr. Mike Nawrocki – ATIS, Vice President Technology and Solutions;
- Dr. Alexandros Kaloyxos – 6G-IA Executive Director;
- Dr. Alex Sprintson – NSF Program Director Resilient & Intelligent NextG Systems (RINGS).



Figure 85: TheNetworkingChannel webpage (episode 22)

Moderator: Dr. Didier Bourse – Nokia, Senior Director, European R&I Programs – 6G-IA Vision Working Group – Portfolio Structuring and Analysis (PS&A) Sub-Group Leader.



Figure 86: The agenda (episode 22)

the energy efficiency of connectivity infrastructures to cope with major traffic growth. These technologies will form the basis for human-centric services and address Sustainable Development Goals (SDGs) such as greening the economy and supporting digital inclusion. This webinar was one unique opportunity to learn more about first both EU Smart Networks and Services (SNS) Joint Undertaking (JU) and US Next Generation Alliance Programmes vision, objectives and implementation and second EU SNS and US RINGS technical roadmap and challenges. Webinar participants also addressed opportunities for 6G transatlantic cooperation.

2030 and beyond, the world will face opportunities and challenges of growth and sustainability of tremendous magnitude. A powerful vision is needed to connect the physical, digital, and human worlds, firmly anchored in future wireless technology and architectural research and innovation. Wireless technologies are of critical relevance for our society and economy today, their importance for growth will continue to steadily increase with 5G and its evolution, enabling new ecosystems and services motivated by strongly growing traffic and trillions of devices. 6G technologies will enable changes in performance from Gigabit to Terabit capacities as well as reaching sub-millisecond response times. In addition, 6G will be designed to enhance drastically



Figure 87: Moments of episode 22

The statistics of the episode are shown below:

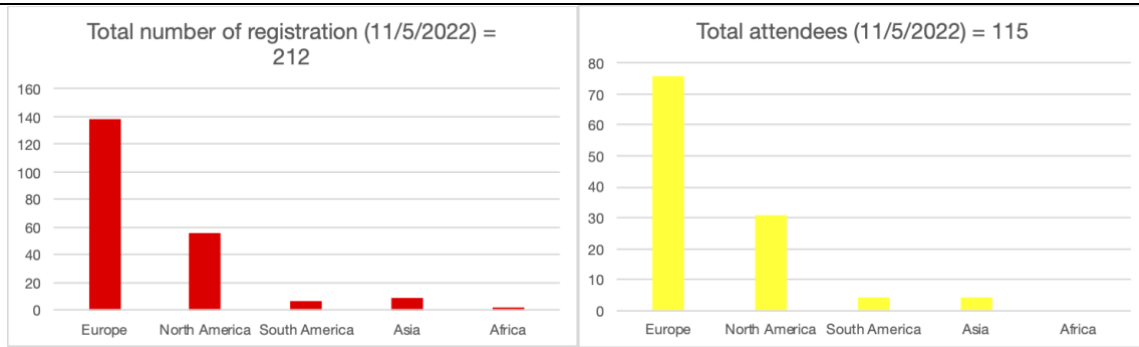


Figure 88: The statistics of Episode 22 (a) – the registrations per region (b) the attendees per region

## 2.2 TheNetworkingChannel statistics

A dedicated YouTube channel used for the recordings of the events, which has 385 subscribers. Figure 89 presents the [YouTube channel](#) where the different talks are being stored for future audience. There are currently (May'22) more than 397 subscribers in the YouTube Channel and the recordings of the events have been viewed hundred times.

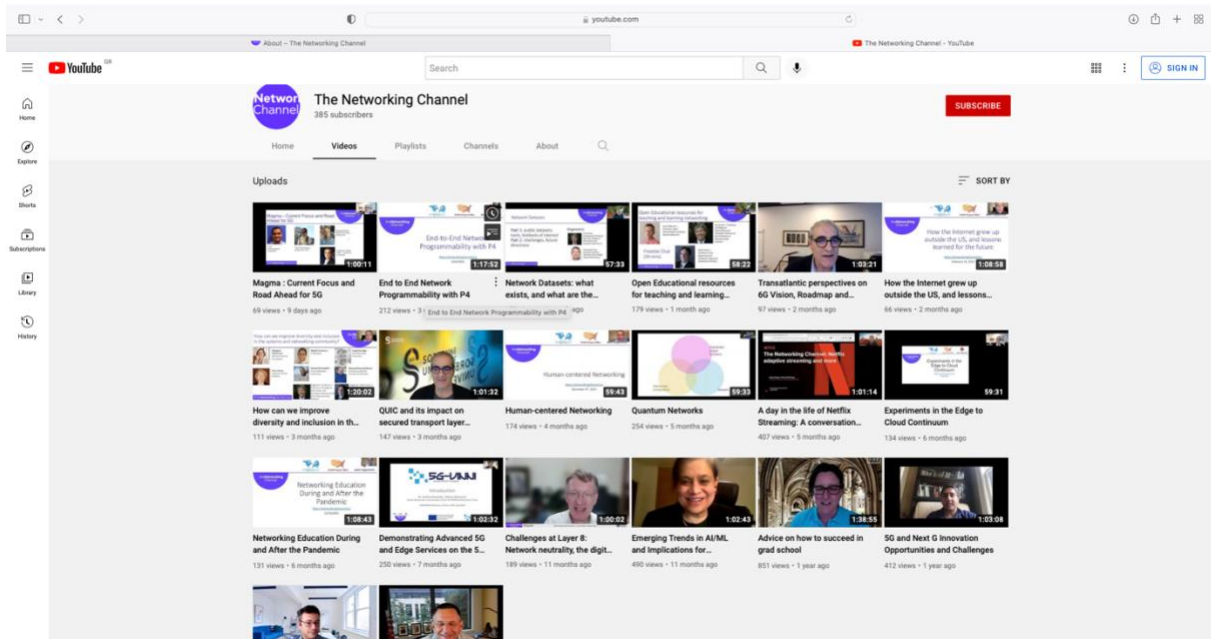


Figure 89: Youtube Channel

Some statistics regarding the attendance of theNetworkingChannel events depicted in Figure 90 - Figure 99.



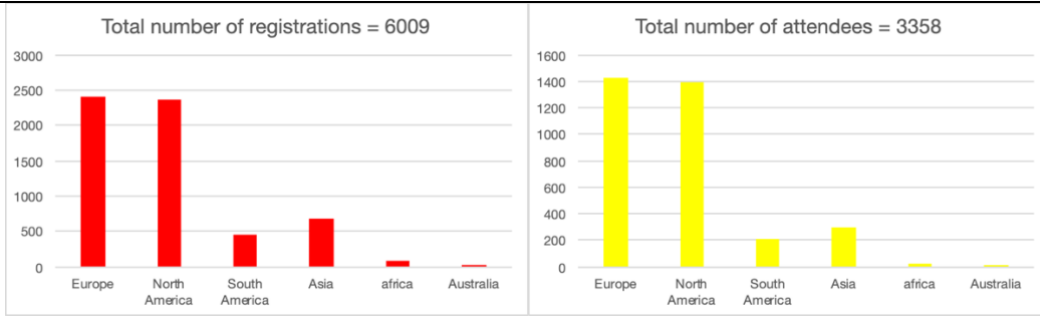


Figure 90: Statistics of the total registrations and attendees per region for the events organized till May 2022

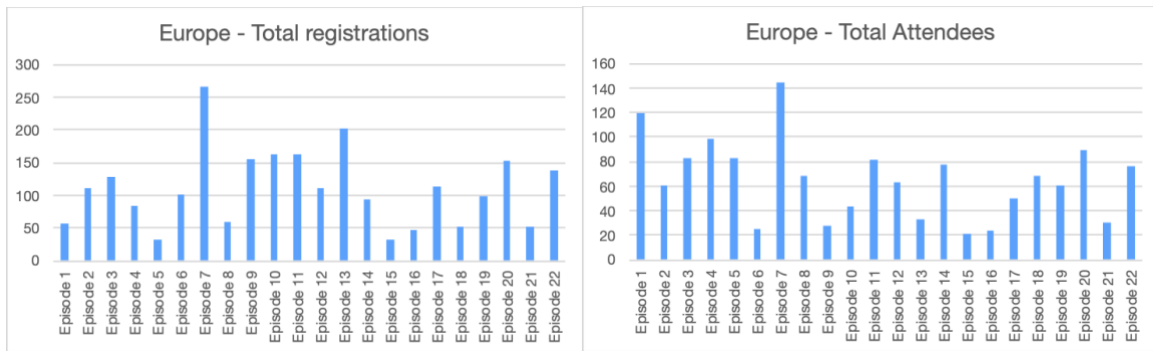


Figure 91: Statistics of the registrations / attendees per event for Europe

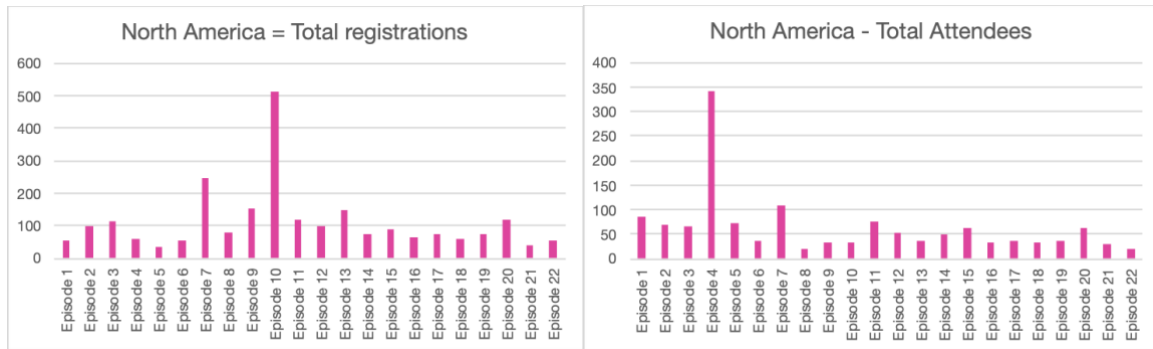


Figure 92: Statistics of the registrations / attendees per event for North America

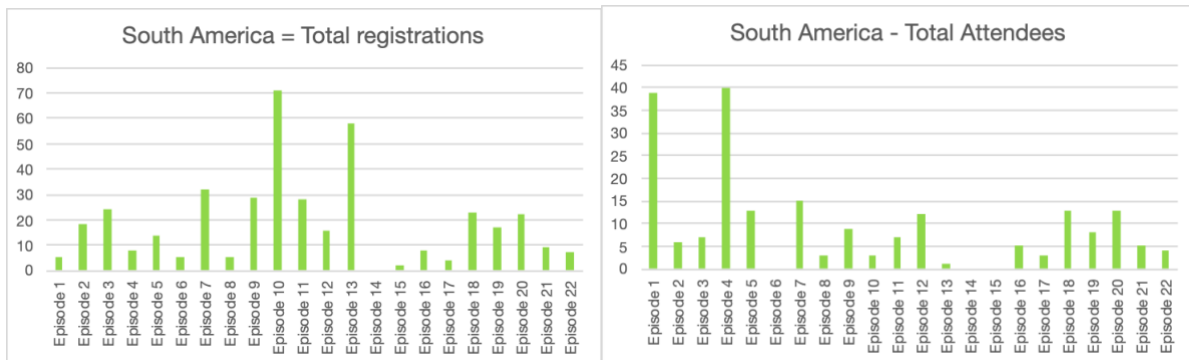


Figure 93: Statistics of the registrations / attendees per event for South America

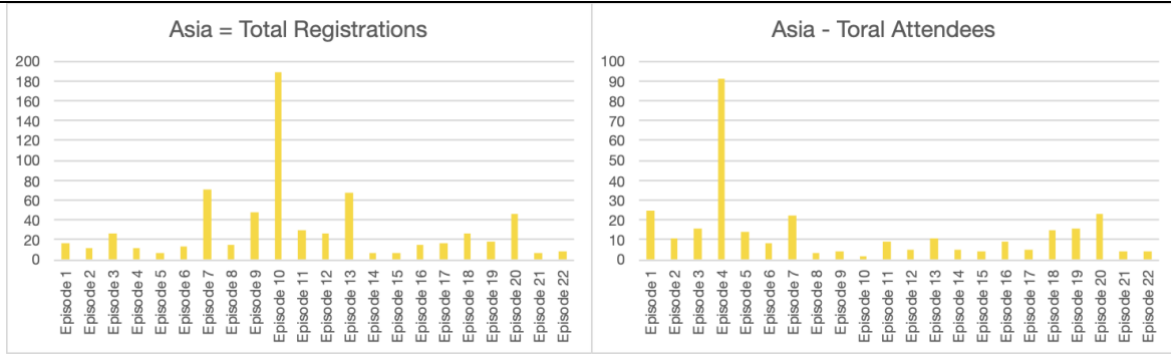


Figure 94: Statistics of the registrations / attendees per event for Asia

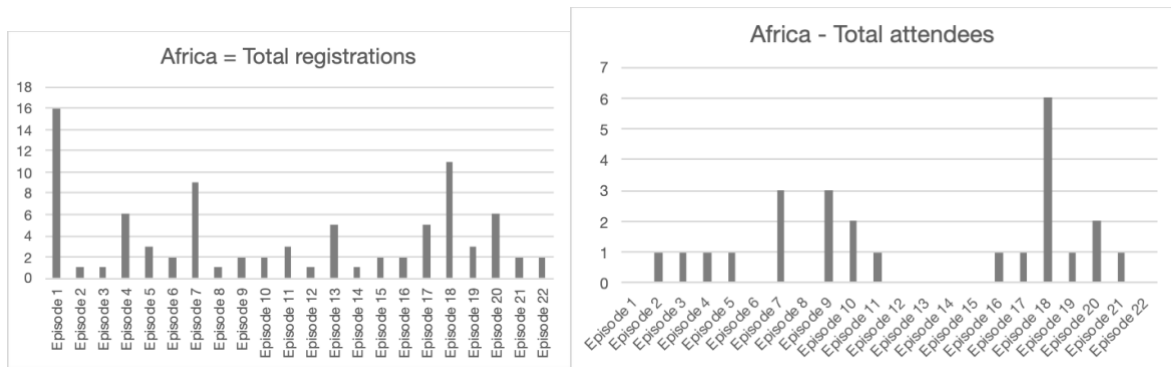


Figure 95: Statistics of the registrations / attendees per event for Africa

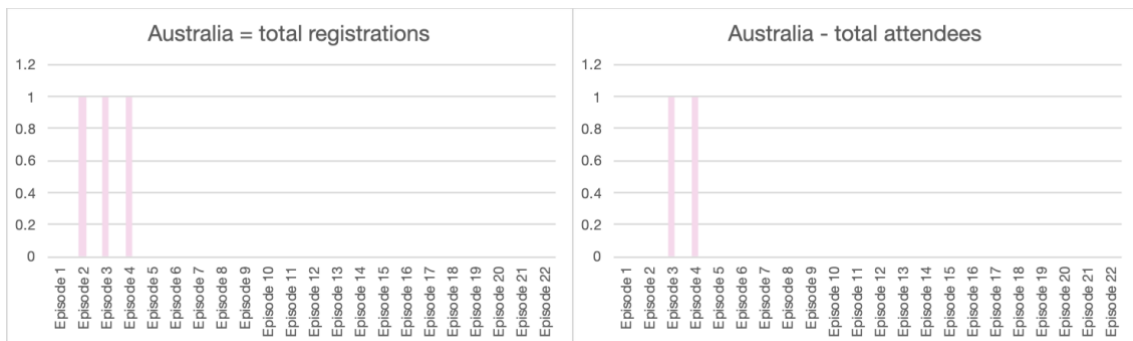


Figure 96: Statistics of the registrations / attendees per event for Europe

## Google Analytics Behaviors Overview

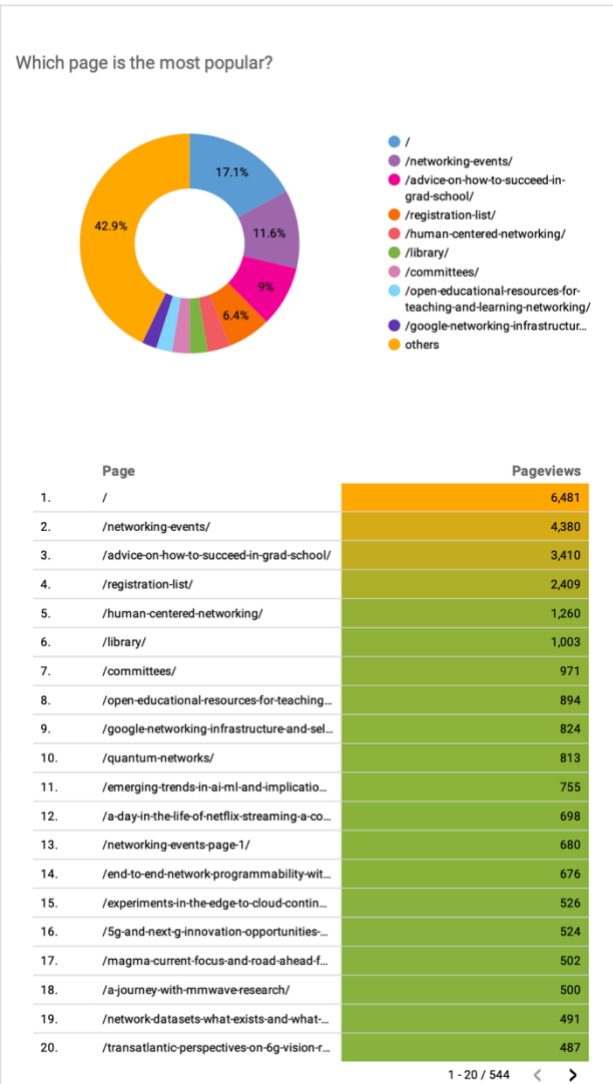
Continent ▾ Region ▾ Channel ▾ Device ▾ Mar 20, 2021 - May 5, 2022 ▾

### Overview of your user behaviors

Pageviews <b>37,898</b>	Unique Pageviews <b>32,019</b>	Avg. Time on Page <b>00:01:42</b>	Bounce Rate <b>55.51%</b>	% Exit <b>55.12%</b>	Pages / Session <b>1.8</b>
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Figure 97: Total visitors of the website

### What do users see when they are in your website?



### Total users per country

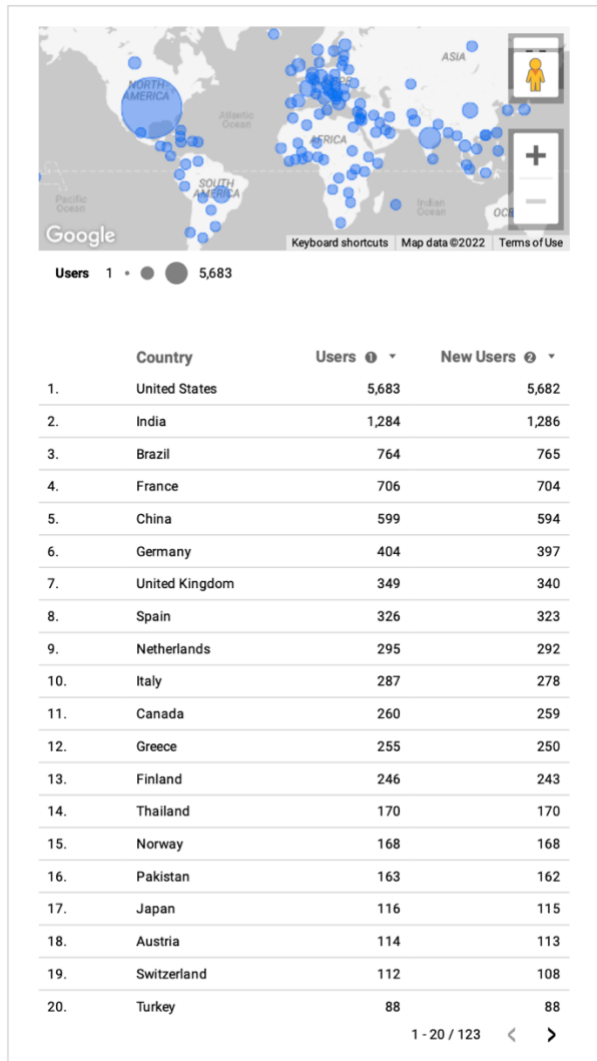


Figure 98: a: Top pages visited, b: Top countries

As can be extracted from above figures, TheNetworkingChannel is working as a fantastic venue for the collaboration between EU and USA. In the last years, characterized by the explosion of virtual events, TheNetworkingChannel has succeeded on attracting the networking community thanks to its top-quality talks and

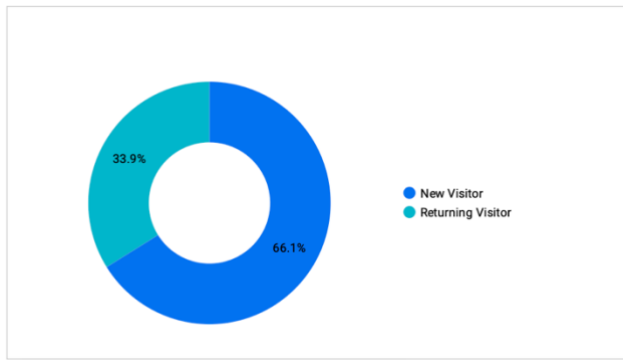


Figure 99: Type of users

speakers. Surprisingly, one of the first talks (as shown in Figure 98), more related to the academic world and the PhD process, is the one with higher number of visits. This indicates that the channel is widely disseminated not only among networking experts but also between young researchers in the area.

In addition, as depicted in Figure 98, most of the users / participants are returning users.

### 2.3 Sustainability of theNetworkingChannel

TheNetworkingChannel will continue its operation with new events planned from September 2022. It was discussed that the activity can continue under the SLICES umbrella ([www.slices-ri.eu](http://www.slices-ri.eu)), which is a stakeholder in the R&D arena and is the digital research infrastructure of the ESFRI roadmap 2021.

### 3. Events that EMPOWER participated and disseminated its activities and results

In the following table the events that EMPOWER participated and disseminated its activities and results are listed.

Table 1 - List of events

EVENT NAME	RELATION TO EMPOWER	DATES	PLACE	OUTPUTS
<a href="#">INFOCOM2020</a>	Participation of Serge Fdida (SU) in the Panel on Reproducibility (CNERT session)	6 July 2020	Virtual	Serge Fdida presented EMPOWER. Reproducibility is one of the identified areas of collaboration.
<a href="#">Forum on 5G Open Radio Access Networks</a>	Participation of Abhimanyu Gosain (Northeastern University/PAWR Office)	14 Sept. 2020	Virtual	Participation of the PAWR Office during the panel session about Technical Deep Dive.
<a href="#">MOBICOM 2020</a>	Participation and presentation of EMPOWER activities from Arturo Azcorra (UC3M) and Serge Fdida (SU)	21-25 Sept. 2020	Virtual	Participation and presentation of EMPOWER activities from Arturo Azcorra and Serge Fdida.
<a href="#">ACM Wintech 2020</a>	Events technically co-sponsored by the PAWR Project Office and by EMPOWER project	25 September 2020	Virtual	Raymond Knopp (EURECOM) was one of the keynote speakers.
<a href="#">6G Symposium</a>	Alain Mourad (IDG) presented EMPOWER	20-21 Oct. 2020	Virtual	Alain Mourad presented EMPOWER and its results to the 6G Symposium which aims to increase public awareness, excitement, and engagement around articulating a strong vision for 6G.
<a href="#">Digital around the world</a>	Presentation of EMPOWER from Serge Fdida (SU)	20 Oct. 2020	Virtual	Serge Fdida presented EMPOWER and gave a presentation titled: International Research Infrastructures - Challenges and Perspectives. Manu Gosain from the PAWR Office also participated.
<a href="#">MoNeTec-2020</a>	Presentation of EMPOWER from Serge Fdida (SU)	28 Oct. 2020	Virtual	Serge Fdida presented EMPOWER.
<a href="#">WEBINAR: "Beyond 5G Evolution"</a>	Organisation by Antonio de la Oliva (UC3M) of a webinar	19 November 2020	Virtual	5GROWTH, 5G-DIVE and EMPOWER co-organize a webinar entitled "Beyond 5G Evolution"
<a href="#">GLOBECOM 2020</a>	Organisation by Antonio de la	7-11 Dec. 2020	Virtual	<i>Industry panel 5 (ip-05, on-demand): Advanced wireless research platforms towards 6G.</i> Participation of Antonio de la Oliva (UC3M), Alain Mourad (IDG), Serge Fdida (SU)

	Oliva (UC3M) of a panel			and Abhimanyu Gosain (Northeastern University/PAWR Office).
<a href="#">6GSymposium</a>	Technology Trends towards 6G: a keynote by Dr Alain Mourad	4-6 May 2021	Virtual	EMPOWER participated at the 6GSymposium, Spring 2021. A variety of process, technology and political challenges pose problems for traditional approaches to standardization. At the same time, approaches based on an open-source methodology would struggle to replicate the strengths of standardization. <a href="https://www.6gworld.com/spring-2021-6g-symposium-agenda/#Anchor-2">https://www.6gworld.com/spring-2021-6g-symposium-agenda/#Anchor-2</a>
<a href="#">INFOCOM 2021</a>	Key ICT conference	10-13 May 2021	Virtual	IEEE INFOCOM is a top-ranked conference on networking in the research community. In particular, the CNERT workshop (Workshop on computer and networking experimental research using testbeds) is developing topics fully aligned with Empower concern.
<a href="#">TCN21</a>	Serge Fdida, EMPOWER coordinator, presented EMPOWER activities	21-25 Jun. 2021	Virtual	Serge Fdida, EMPOWER coordinator, presented EMPOWER activities
<a href="#">Mobile World Congress</a>		28 Jun.-01 Jul. 2021	Barcelona	MWC Barcelona is the world's most influential exhibition for the connectivity industry. In 2019, up to 2,400 exhibitors, 8,000 CEOs and 59% of the industries' most important decision makers gathered here.
<a href="#">The 30th International Conference on Computer Communications and Networks</a>	Serge Fdida, EMPOWER coordinator, presented EMPOWER activities	19-22 Jul. 2021	Athens, Greece	EMPOWER presented at the panel of ICCCN 2021 conference Cities of the future: what possible evolution towards the creation of smart communities.
<a href="#">3rd Buffalo Wireless Day</a>	Serge Fdida, EMPOWER coordinator, presented EMPOWER activities	19 Nov. 2021	Virtual	<a href="http://www.acsu.buffalo.edu/~guan/wirelessday/2021.html">http://www.acsu.buffalo.edu/~guan/wirelessday/2021.html</a>
<a href="#">University of South Carolina Technology Seminar</a>	Alain Mourad	03 December 2021	Virtual	Presented on "Technology Trends towards 6G with a Deeper Dive on RIS"
<a href="#">GLOBECOM 2021</a>	Panel presentation organized by Antonio de la Oliva with key EMPOWER players.	07-11 Dec. 2021	Madrid	The 2021 IEEE Global Communications Conference (GLOBECOM) will be held in Madrid, Spain, from 7 -11 December 2021. Themed "Connecting Cultures around the Globe," this flagship conference of the IEEE Communications Society will feature a comprehensive high-quality technical program including 12 symposia, selected areas in communications track and a variety of tutorials and workshops.
<a href="#">WWRF Steering Board 6G Workshop</a>	Alain Mourad	17 December 2021	Virtual	Presented on "EMPOWER B5G Technology Roadmap"



<a href="#">NGMN 6G Forum</a>	Alain Mourad	17 February 2022	Virtual	Presented on “The Path to 6G: Target Capabilities and Technology Trends”
<a href="#">ETSI Board</a>	Alain Mourad	13 April 2022	Virtual	Presenting on “EMPOWER Technology Roadmap”
<a href="#">EU-US (NSF-DG Connect) meeting – BY5G and 6G cooperation</a>	Organisation by Serge Fdida, EMPOWER coordinator	15 Mar. 2022	Virtual	Meeting between the EU and the NSF to discuss the EU-US BY5G and 6G cooperation

## 4. Supported Hackathon

EMPOWER supported the **ETSI MEC HACKATHON 2021 – THE DEVELOPER CHALLENGE**, organised on 12-15/10/2021. MEC (Multi-access Edge Computing) provided developers with localized, low-latency resources that can be utilized to create new and innovative solutions, which are essential to many vertical markets of the 5G era. ETSI's [ISG MEC](#) is standardizing an open environment that enables the integration of applications from infrastructure and edge service providers across MEC platforms and systems. The purpose of this Hackathon was to demonstrate the usage of MEC Service APIs to create an innovative Edge Application or Service.

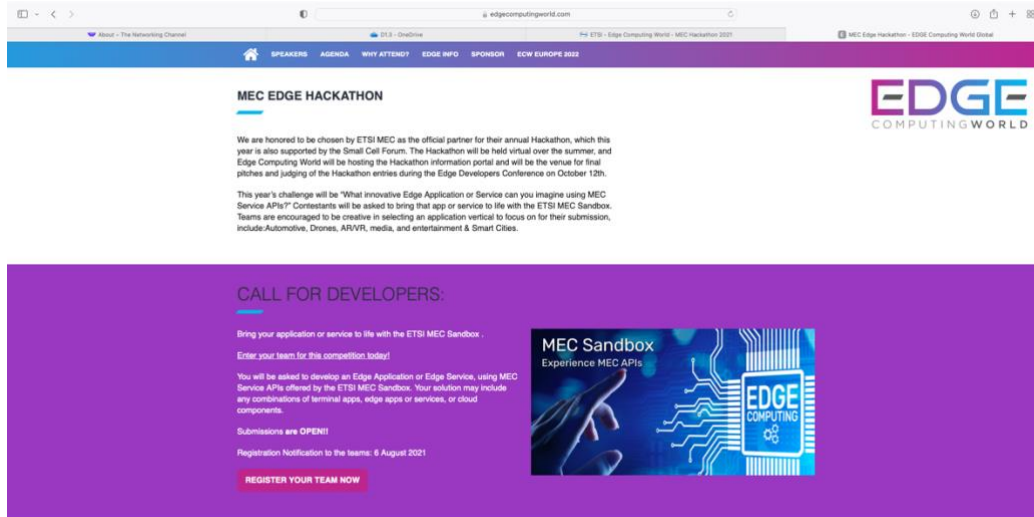


Figure 100: Hackathon webpage (1)

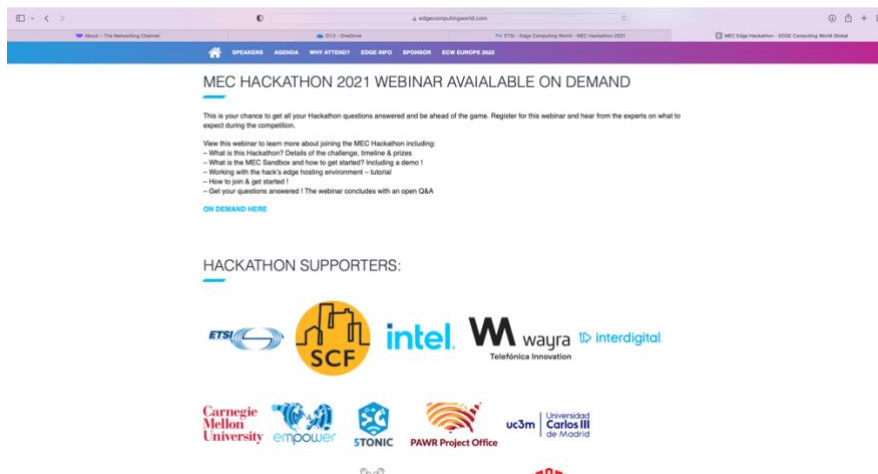


Figure 101: Hackathon webpage (2)



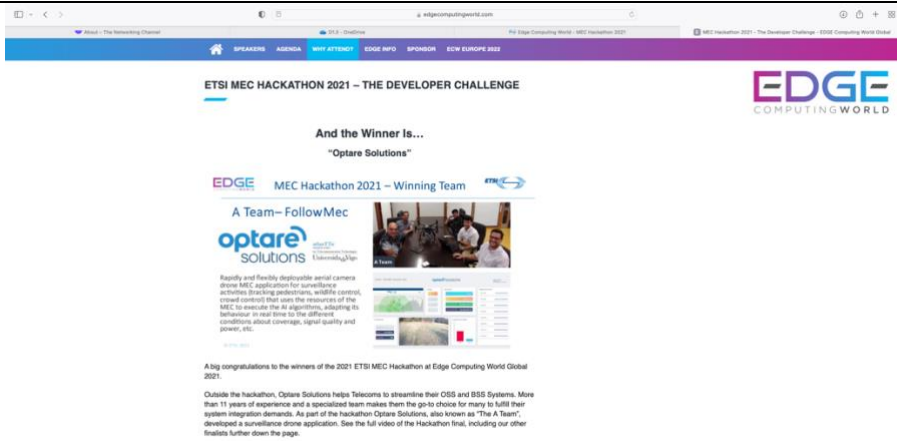


Figure 102: Hackathon webpage (3)



## 5. EMPOWER Workshops

Other than theNetworkingChannel events, EMPOWER organises the following workshops within the umbrella of big conferences as detailed below:

- EUCNC & 6G event, June 7-10, 2022
- IFIP Networking 2022 conference, June 13-15, 2022
- the full day event organized during the IoT week, Dublin, June 23 2022.

### 5.1 EuCNC & 6G workshop

Link: <https://www.eucnc.eu>

[EUCNC EMPOWER Workshop June 7 2022, Grenoble France - Empowering Transatlantic Platforms for 5G Advanced and 6G Networks.](#)

This main objective is to further put in contact key persons on Europe and USA to further develop collaborations and discuss possible joint activities and evolution of the wireless platforms at both sides of the Atlantic towards beyond 5G technologies. In addition, the ongoing work of the EC H2020 5G Infrastructure PPP projects, their NSF PAWR counterparts and the plans for the EC Horizon Europe Smart Network and Services (SNS) – Joint Undertaking (JU) programme will be presented.

The draft agenda is listed below:

#### **Opening (15min)**

Didier Bourse (Nokia), Serge Fdida (Sorbonne Université), Abhimanyu Gosain (Northeastern University), Stavroula Maglavera (UTH), Alain Mourad (Interdigital)

**Keynote (30mn):** Innovation around 5G, Sumit Roy (University of Washington & DoD)

#### **Session 1 (60mn): Presentation of the EU and US platforms**

- *Key 5G Infrastructure PPP projects platforms and demonstrated vertical use-cases*, Alex Kaloxylas (6G-IA).
- *OpenAirInterface*, Raymond Knopp (Eurecom)
- *The COSMOS platform*, Ivan Seskar (Rutgers).
- *The POWDER-RENEW platform*, Kobus van der Merwe (Utah).

#### **Coffee break (30mn)**

#### **Session 2 (45mn): The 6G roadmap vision**

- *Highlights on the transatlantic EU-USA 6G, the EMPOWER roadmap*, Alain Mourad (InterDigital).
- *Presentation by HEXA-X*, Volker Ziegler
- *6G vision by Orange*, Jean Schworer

#### **Panel (30mn): Challenges ahead for EU-US cooperation on test facilities**

Moderator(s): Serge Fdida (Sorbonne Université), Abhimanyu Gosain (Northeastern University)

Panelists: Bernard Barani (EC), Mauro Boldi (Telecom Italia) (tbc), Raymond Knopp (Eurecom), Ivan Seskar (Rutgers), Sumit Roy (DoD), Murat Torlak (NSF-remote),

*Round table of representatives of EC and US Platforms. Active discussion on the future of the Platforms and their expected technology evolution.*

### 5.2 IFIP Networking Conference 2022 workshop

Link: <https://networking.ifip.org/2022/index.php/slices-workshop>



Figure 103: IFIP Networking 2022 workshop

The details of the workshop can be found at:

<https://slices-ri.eu/events/slices-workshop-scientific-instruments-to-support-digital-infrastructure-science/>

The draft agenda of the workshop is listed below:

#### 9:00 -Welcome – State of play and challenges

Manu Gosain (Northeastern University), Serge Fdida (Sorbonne Université)

#### 9:30-10:00 Keynote

*Title*, Ivan Seskar

#### 10:00-11:00 – Testbeds design

*- Prototyping Prototyping Facilities: Developing and Bootstrapping Testbeds*

Sebastian Gallenmüller, Sebastian Gallenmüller, Georg Carle (Technical University of Munich, Germany)

*- Federating EdgeNet with Fed4FIRE+ and Deploying its Nodes Behind NATs*

Berat Can Şenel (Sorbonne Université, France), Maxime Mouchet (Sorbonne Université, France), Justin Cappos (NYU Tandon School of Engineering), Timur Friedman (Sorbonne Université, France), Olivier Fourmaux (Sorbonne Université, France), Rick McGeer (engageLively)

*- On the way to a configurable testbed to support IoT research*

Giuseppe Tricomi, Zakaria Benomar, Francesco Longo, Giovanni Merlino, Antonio Puliafito (University of Messina, Italy)

#### 11:00-11:30 Break

#### 11:30-12h30 – Testbed components

*The AERPAW Control Framework – Considerations for Resource Control and Orchestration for a Computing-supported Physical Research Platform*

Magreth J Mushi (North Carolina State University, USA), Harshvardhan P Joshi (Cisco Systems, Inc, USA), Rudra Dutta (North Carolina State University, USA), Ismail Güvenç (North Carolina State University, USA), Mihail Sichiitu (North Carolina State University, USA), Thomas Zajkowski (North Carolina State University, USA), Yufeng Xin (University of North Carolina, USA), Michael Stealey (University of North Carolina, USA), Erik Scott (University of North Carolina – Chapel Hill, USA)

*Build Automation Framework for Design Validation of Automotive Gateway Controller*

Angela Gonzalez (Huawei Technologies Duesseldorf GmbH, Germany), Nikhil Halinge (Huawei Technologies Duesseldorf GmbH, Germany), Francesc Fons (Huawei Technologies Duesseldorf GmbH, Germany), Juan Moreno (Technical University of Catalunya, Spain)

*FABRIC Network Service Model*



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Paul Ruth (UNC-CH, USA), Ilya Baldin (RENCI/UNC Chapel Hill, USA), Komal Thareja (RENCI – UNC Chapel Hill, USA), Tom Lehman (Virnao, USA), Xi Yang (Esnet, USA), Ezra Kissel (ESNet, USA)

**12:30-13h00 – Wrap up**

Manu Gosain (Northeastern University), Serge Fdida (Sorbonne Université)

### 5.3 IoT Week workshop

Link: <https://iotweek.org/>

EMPOWER is involved in the organization of the following sessions during the IoTWeek

**Session 1: Data Spaces for Interoperable Research Data Management and Governance (DS4RDM)**

Chair: Yuri Demechenko (UW)

Panelists: Panayotis ANDreou (Uclan), Walid Dabbous (INRIA), ESFRI representative

**Session 2: Research Infrastructure for Cloud, Edge, IoT**

Chair: Andrea Passarella (CNR)

Panelists: Bartoz Belter (PSNC), Thanasis Korakis (UTH), Cedric Crettaz (Mandat), Raymond Knopp (Eurecom), Didier Bourse (Nokia), Konstantinos Fillis (Cosmote)

**Session 3: International Cooperation for Large Scale Research Infrastructures**

Chair: Serge Fdida (Sorbonne Université)

Panelists: Olga Cavalli, Glenn Ricart, Abimanyu Gosain, Bernard Barani, Jerome Sobieski



## 6. Conclusions

This document reports on the organisation of EMPOWER events and engagement activities within the second part of the project covering the period M19-M42. During this period, the different activities for engaging the community were planned and discussed within the EMPOWER group. The tools include the organisation of theNetworkingChannel, organisation of Hackathon, workshops and tutorials.