



Transforming Cities into 5G Neutral Hosts

The 28th edition of [EuCNC 2019](#) – *Enabling Smart Connectivity* – that took place in Valencia last 18 to 21 of June, was a great opportunity to bring together a vast community of cutting-edge research, industries and business on telecommunications; specifically the 5G ecosystem from all over the world, to present their latest research results, showcase demos, and trials testing from successive European R&D programmes co-financed by European Commission.

Sponsored by IEEE Communication Society, the European Association for Signal Processing; and supported by the European Commission, this year's event was co-located with the 7th **Global 5G Event – 17-18 June**, bringing together the world 5G industrial associations: **5G-IA, IMT-2020, 5G-Forum, 5G-MF, 5G-Brasil and 5G-Americas**, to discuss progresses on 5G from around the world in an intense 2-days programme inspired by the theme: ***Creating the smart digital future.***

Once again, the [5GCity Consortium](#) was heavily involved in the EUCNC 2019 event with multiple activities: participation to panel discussions and special sessions with the 5G scientific community convened in Valencia, presentation of results and achievements, showcasing of demos and a live outdoor trial.

The [5GCity](#) project is developing a distributed cloud and radio platform for municipalities and infrastructure owners acting as **5G Neutral Hosts**. It is a completely de-centralised 3-tier architecture where compute, storage and networking are allocated between core and edge segments of the 5G network infrastructure. On top of this distributed infrastructure, we provide unified control and orchestration of all the radio-edge-core resources, through powerful APIs and serviced design toolkits for innovative vertical application services, e.g. to program connectivity with QoS, implement flexible media acquisition, transcoding, etc. Our 5G Network Slicing and Service Orchestration technologies are used in live city pilots in the cities of **Barcelona** (ES), **Bristol** (UK) and **Lucca** (IT) to run trials of Media Verticals use cases

which will assess how a Neutral Host operator can offer mobile connectivity solutions on demand to implement dedicated network slices for different media services in areas with a high concentration of users.

The Consortium's activities run during the EuCNC2019 were:

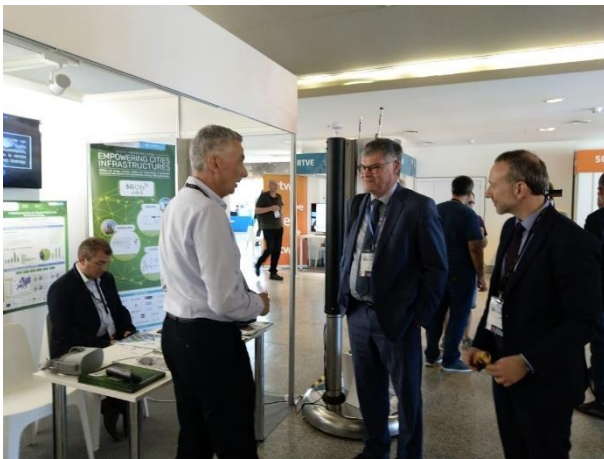
EXHIBITION 5GCity BOOTH #9

Monday 17 - Friday 21 June 2019

The goal with 5GCity demonstrations at EuCNC2019 was to showcase how easy is to transform city infrastructures in **5G Neutral Hosts** and how powerful and flexible the 5G service design and lifecycle management is with 5GCity platform. At booth #9 it was run the 1st complete release of 5GCity platform and SDK, integrated and in support of a few relevant media use cases in a near real-life scenario. At the exhibition booth, the consortium presented also the 5G Neutral Host business modelling approach, discussing results with the technical team and sharing information on projects latest activities in the three pilots in Barcelona (ES), Bristol (UK), and Lucca (IT).

DEMOS-TESTS

5GCity demonstrations in Valencia were distributed between the 5GCity exhibition booth and the outside area of the convention building. Several authorities visited booth #9; like **Pearse O'Donohue**, Director for Future Networks in the European Commission, DG CONNECT, responsible for 5G.



Source: 5GCity partners

5GCity @5GCity · 18 giu
Extraordinary visit @PODcloudEU in our booth during @EuCNC Just to show latest update and how we have made from Liubljana to Valencia @ginocarrozzo @NinoAlbanese @GoClearNow @ComunicareDigit @EBU_HQ @esa @i2CAT @mariaritaspada @acceleran @5GPPP @Global5Gorg
Traduci il Tweet

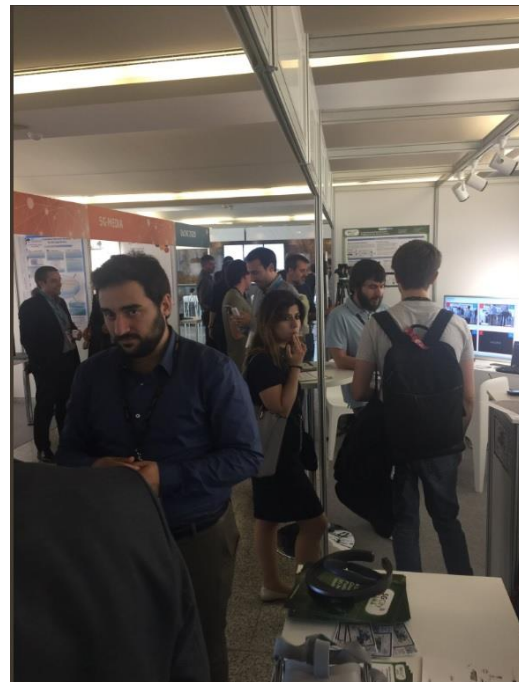


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Source: 5GCity partners

Partners had the chance to show Mr. O'Donohue latest outcomes in the different media use cases running on heterogeneous slices in the shared infrastructure managed by the 5GCity platform.

Another interesting visit was with **Darko Ratkaj** senior project manager at the **EBU's** Department of Technology & Innovation.



Source: 5GCity partners

INDOOR ACTIVITIES

The four demos showcased at 5GCity booth were:

- **5GCity SDK + Neutral Host Platform:** This demo has two parts: 1) it demonstrates how 5GCity SDK facilitates creation, packaging & on-boarding of network services; 2) it shows how the 5GCity neutral host platform enables an ICT infrastructure owner to slice and lease its infrastructure to 3rd parties (e.g. MVNO).
- **Video Acquisition & Production:** This demo includes acquisition of live high-quality multiple videos from the event and streaming through 5GCity platform. Such services also can support the engagement of public in the media production for big events.
- **Augmented Reality service:** This demo offers immersive experiences with distribution of UHD contents for city services. The demo leverages on 5G orchestration to offer immersive experience to end-user (e.g., tourists) who can see a reconstruction of antique city buildings and towers in real-time with enriched context information superimposed via holographic models.
- **Mobile Backpack Transmission:** This demo highlights how high bandwidth connection over a dedicated network slice can enhance live TV transmissions from a mobile backpack. In this case, we use acquisition, processing, and streaming/broadcasting of multiple live HD videos from a professional mobile TV camera which moves in the outdoor demo area of the conference site for typical journalist activities. The camera is connected to a TV production and streaming service station installed in the 5GCity booth.

The above proposed demonstrations were aligned with the Radio Access and Softwarization (RAS) and Network Softwarization (NET) main tracks of the EUCNC conference.

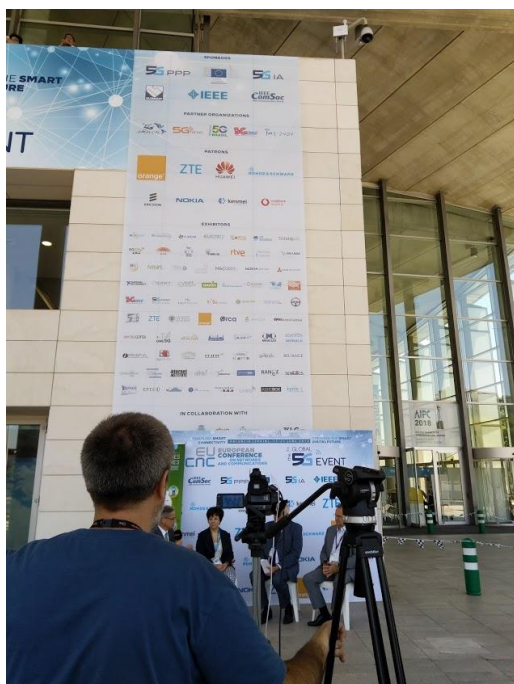
OUTDOOR ACTIVITIES

EUCNC 2019 | VALENCIA



Source: 5GCity partners

A series of activities were organized also by 5GCity in the Outdoors Exhibition Area. Our colleagues from Betevé (the Barcelona media TV Company, partner of 5GCity) well documented the busy outdoor interviews with live TV transmission on top of the 5GCity platform deployed in Valencia: camera operators were equipped with a 5GCity video transmitted live via 5GCity network to editors at booth #9 for production and subsequent streaming on the Internet.



This 5GCity-powered outdoor broadcasting events had the aim to demonstrate also the high portability of the **5GCity Neutral Host** solution along with showcasing a key media use case for 5G in the cities.



Source: 5GCity partners

A series of interviews moderated by Andrea Michelozzi from CoDi, another partner of 5GCity project, with representatives of relevant institutions were live broadcasted by Betevé, following a planned agenda:

Tuesday 18 June 2019

- **5G & Verticals - Media services with 5G in cities:**

We discussed with **Darko RATKAJ** senior project manager at the **EBU's** Department of Technology & Innovation; with **Maria GUTA** - **ESA** European Space Agency in the Telecommunications Systems and Integrated Applications Directorate; and Prof. **Panagiotis DEMESTICHAS** – University of Piraeus for **5GTours** about **Smart Tourism and Smart Stadium**, the future of tourism and sport events consumption in cities with 5G. [Full discussion](#)



Source: 5GCity partners

An interesting review on 5G and verticals with **Pere VILA** - Director de Technological Strategy and Digital Innovation at RTVE. [Full interview](#)



Source: 5GCity partners

Wednesday 19 June 2019

- **5GTechCorner:**

At the outside setting, a focus panel with key representatives of 5G in Europe: **Bernard BARANI** Deputy Head of Unit- Future Connectivity Systems **European Commission**; and **Colin WILLCOCK** Chairman of the Board at **5G IA** for an update on the **Status of 5G in Europe**. [Full discussion](#)



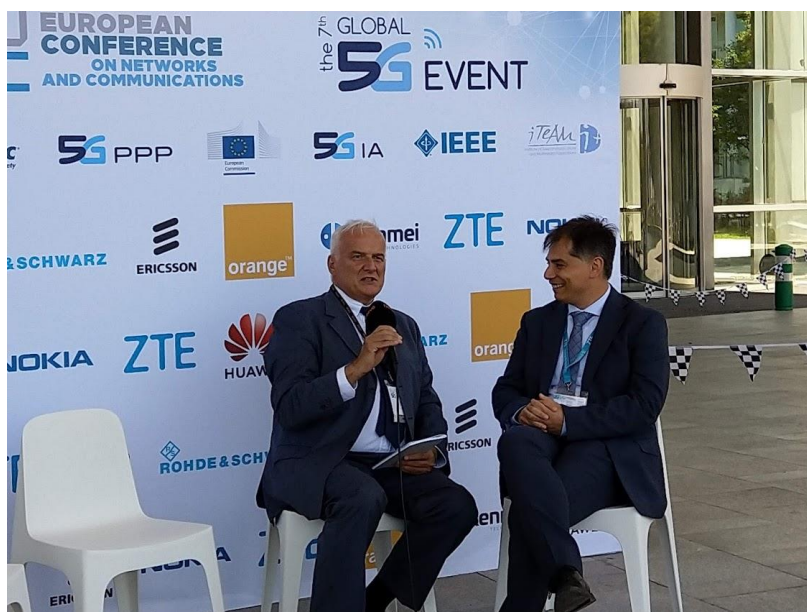
Source: 5GCity partners

A great discussion with 5GCity partners: **Theodoros ROKKAS** CTO **INCITES Consulting** and **Apostolos PAPAGEORGIU** senior researcher at **i2CAT Foundation** about the “5G deployment in EU” report. [Full discussion](#)



Source: 5GCity partners

Interview with **Gino CARROZZO** R&D and senior network architect at **Nextworks** on 5GCity project latest outcomes and results. [Full interview](#)



Source: 5GCity partners

Thursday 20 June 2019

- **5GCCC (Competence-Centre-Corner):**
A live focus panel with **Narcís CARDONA** from **Universitat Politècnica de València**, **Sergi FIGUROLA** CTIO at **i2CAT Foundation**; and UPV students to discuss about **5G Jobs**, jobs opportunities opened by the 5G ecosystem. [Full discussion](#)



Source: 5GCity partners

SPECIAL SESSIONS/WORKSHOPS

5GCity partners were heavily involved in workshops and presentations during the event:

[ThD1: Special Session 3: 5G trials for vertical industries](#)

In the session organised by [NRG-5](#); [5GCity](#) gave its contribution with two short papers presented by partners.

Thursday, June 20 14:00 – 15:45

- **Path to 5G Smart Cities: experiences from Media and Public Safety Pilots in 5GCity**
Gino Carrozzo (Nextworks, IT); Muhammad Shuaib Siddiqui (i2CAT, Spain)



Source: 5GCity partners

- **Definition and Evaluation of Latency in 5G with Heterogeneous Use Cases and Architectures.**
Gino Carrozzo (Nextworks, IT); Muhammad Shuaib Siddiqui (i2CAT, Spain).

[TuB8: Workshop 2 - Session 2 From Cloud-ready to Cloud-native transformation](#)

Session organized by 5G PPP Architecture WG

Tuesday, June 18 11:00 - 13:00

- **"Slicing-aware service orchestration"**, Presented by Apostolos Papageorgiou (i2CAT, Spain)

WeC6: Workshop 5 - Session 1: Emerging 5G Business Models - Opportunities for SMEs and large companies-lesson from 5G PPP (5G-EBM)



Source: 5GCity partners

- Session organized by Networld2020 SME WG and various 5G PPP Phase 2 and Phase 3 projects to discuss exploitation potential and concrete innovation opportunities for SMEs.

Wednesday, June 19 14:00 - 17:30

- SMEs in the Spotlight - Lightning talks with Q&A on taking 5G innovations to market:

"5G new opportunities for verticals and technology providers: an SME viewpoint", Nicola Ciulli (Nextworks, Italy).

"Business Models for Neutral Hosts", Theodora Rokkas (Incites, Luxembourg)



ThC8: Workshop 8 - Session 1: International Workshops on 5G Architectures

organized by 5G PPP Architecture WG

Thursday, June 20 14:00 - 15:30

- Jointly presentation of findings and analysis of 5GPPP Phase 2, **5GCity** participation on White Paper architecture; attending Antonino Albanese (Italtel, Italy).

PAPERS

With great satisfaction from all partners involved in the joining effort, two 5GCity papers were accepted for presentation at the EUCNC main conference track with publication in conference proceedings and IEEE Xplore indexing.

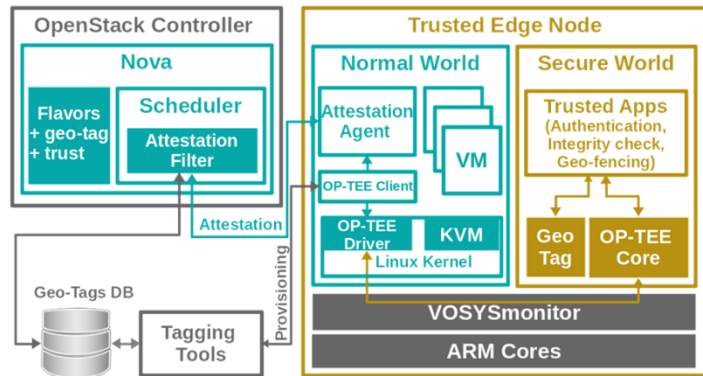
ThC4: Network Security

Thursday, June 20 14:00 - 15:30

- **Secure location aware VM deployment on the edge through OpenStack and ARM TrustZone.**

5GCity Authors: Teodora Sechkova, Enrico Barberis, Michele Paolino (Virtual Open Systems SAS, France)

Abstract: The paper presents the location-aware capabilities of a trusted EdgeVIM, work done by Virtual Open Systems as part of the 5GCity project. The goal of developing a VIM with integrated security features is to build a trusted edge based on the hardware isolation of ARM TrustZone. On top of that, the trusted VIM is used as a secure foundation to perform location-aware virtual machine deployment utilizing the dispersed nature of the infrastructure.

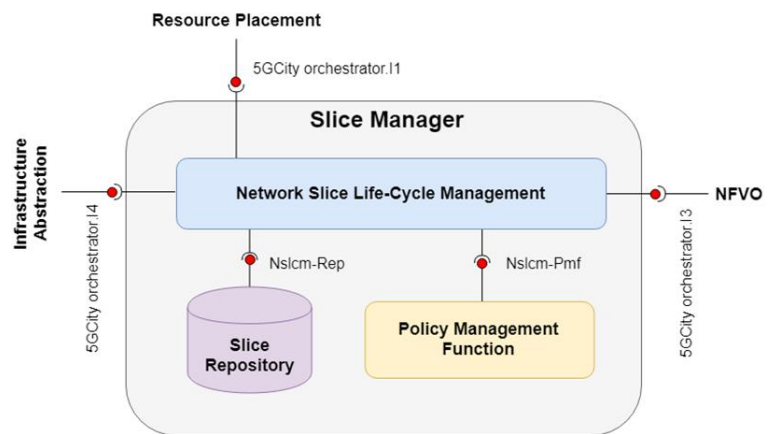


WeC3: Orchestration and Virtualisation

Wednesday, June 19 14:00 - 15:30

- **Network Slicing-aware NFV Orchestration for 5G Service Platforms**

5GCity Authors: Hamzeh Khalili, Apostolos Papageorgiou and Shuaib Siddiqui (i2CAT, Spain); Dimitra Simeonidou, Carlos Colman-Meixner and Reza Nejabati (University of Bristol, UK); Gino Carrozzo (Nextworks, Italy).



Abstract: The paper presents a survey of how various network virtualization solutions address slicing, reviewing the management and orchestration tools available to implement network slicing, and describing the slice-aware orchestration platform designed for 5GCity. The 5GCity “Slice Manager” enables the virtualized and non-virtualized network elements and function to be easily logically segmented, configured and reused in order to meet various demands.

[Full papers](#)



More info:

www.5gcity.eu @5gcity info@5gcity.com

Shuaib Siddiqui

shuaib.siddiqui@i2cat.net

+34 638 687 554

Gino Carrozzo

g.carrozzo@nextworks.it

Carla Bressan

bressan@comunicaredigitale.it

+34 606 516 106

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5GCity Consortium

