

5G Barcelona



7th EU-Japan Symposium on ICT
Research and Innovation



Dr. Sergi Figuerola

CTIO, i2CAT

sergi.figuerola@i2cat.net | @sfiguerola

M: +34.675.780.950

Why Barcelona?

The city of Barcelona gathers all the necessary elements to become a **reference city** and a pioneer **5G Southern Europe Digital Hub**



Barcelona hosts the global reference event of the mobile sector: **Mobile World Congress** (110.000 professional visitors/year)



Entities based in Catalonia are (have been) involved in **50% of the 5G research projects** funded by the European Commission through the 5GPPP during 2014 – 2018



Barcelona has a wide range of research and development assets to create an open 5G technology lab, with a strong commitment and support from the public administrations.

5GBarcelona

5GBarcelona is a public-private initiative working to transform the metropolitan area of Barcelona into an **open and neutral city-wide lab** for the **validation and adoption of 5G technologies and applications in a real-life environment.**

The initiative creates synergies within the ecosystem and offers an experimental infrastructure to test, prototype and implement new digital solutions in the city. 5GBarcelona wants to **stimulate the existing innovation** in Barcelona, help to **attract foreign investment, boost tech start-ups** and **generate an entire industry around 5G technology.**

The initiative is powered by:



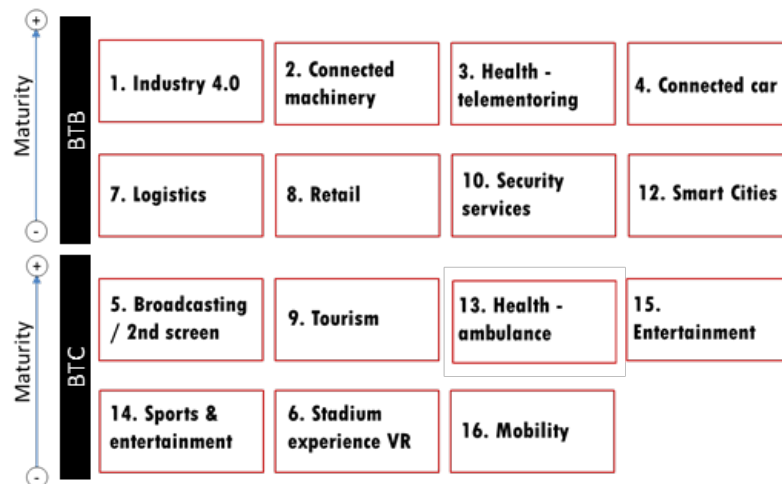
What do we offer?



What do we offer?

Adoption & Validation of 5G

- Test, prototype, and implement your 5G solution in Barcelona **open and neutral city-wide lab**
- Participate in the definition and execution of **pilots**, use cases and projects with top-companies within industry verticals
- Use 5GBarcelona’s SPC service - **Single Point of Contact** - to manage local partners, key city stakeholders, local infrastructure and external requirements for a smooth execution of your activities
- Access to 5GBarcelona labs for the validation of technologies and applications in real-life environment



What do we offer?

Business Opportunities

- Access to the 5GBarcelona's ecosystem, where companies, institutions, entrepreneurs and innovators develop 5G technologies
- Find the most suitable local partners for the execution of 5G projects, pilots and use cases
- Co-invest in pilots and use cases in Barcelona through public-private partnerships
- Co-invest in creating a 5G laboratory within the 5GBarcelona 5G-nodes lab



- *Thingnovators* Ecosystem
- Beyond the usual tech lab.
- Reknown technology manufacturers.
- Engineering support for integration needs.
- TEF inner business channel for *Thingnovators*.
- Solutions certification

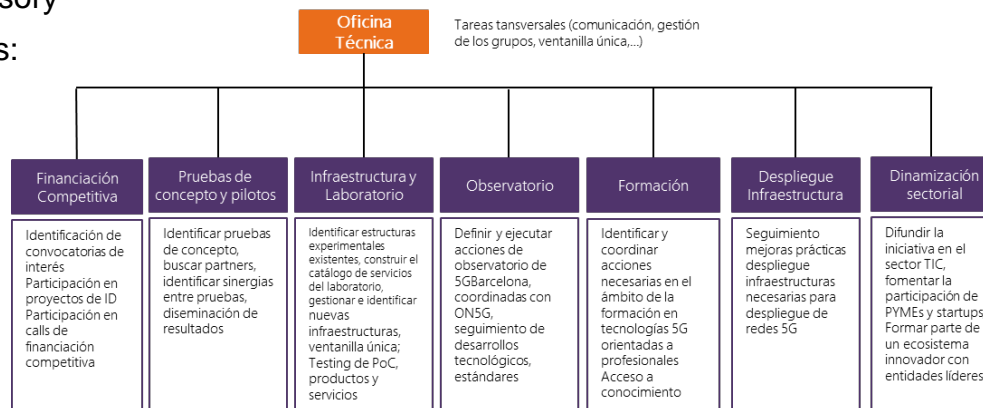
- Create partnership consortia to competitive calls under European Commission 5GPPP programme or other national funds



What do we offer?

Knowledge & Trainings

- Access to technical training and seminars
- Access to reports, scientific papers and tech transfer information
- Share knowledge and knowhow in 5G arena
- Define best practices of pilots, use cases, and in the deployment of 5G networks
- Access to 5G technical oversight and advisory
- Participate in 5GBarcelona working groups:



5GBarcelona Partners - Ecosystem



Current Verticals under development in 5GBarcelona

Remote Media Production (5GCITY – Infra. Slicing)



Connected Car (MEC – low latency)



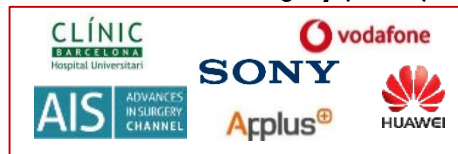
Public Transport (5GPICTURE - mmWave)



Health – Ambulance (Multi-connectivity)



Health – Assisted Surgery (URLLC)

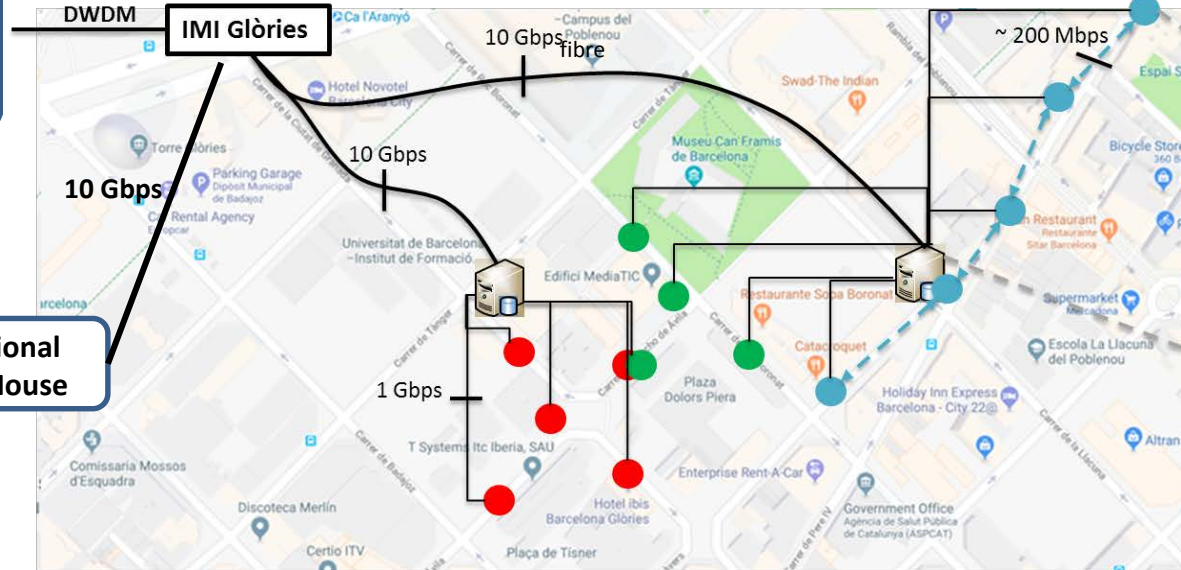
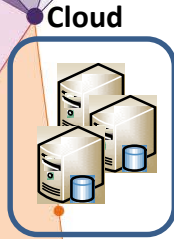


Industry 4.0 (mMTC)



Example of available infrastructure in Barcelona

FLAME 5GCity 5GCroCo



Reserved space
in lamp-posts



Reserved space in
Street Cabinets

International
Carrier House

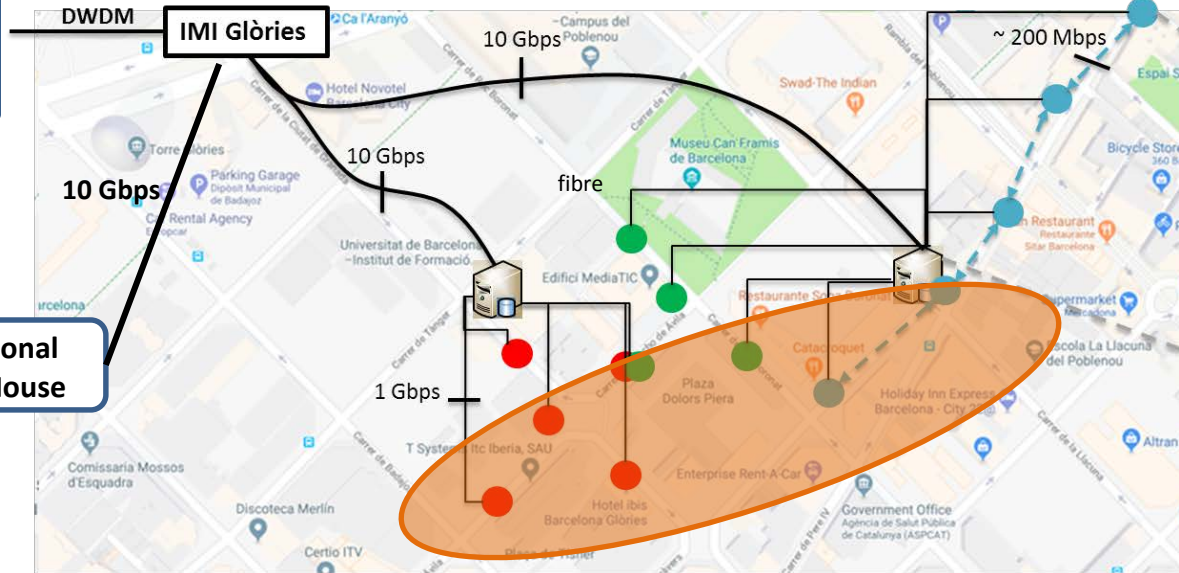
- pre-5G Small Cells B42
- Custom Wi-Fi AP, multi-NIC 802.11ac Wave 2
- Custom Wi-Fi AP, multi-NIC 802.11ac Wave 2 + wireless backhaul



MEC node: street cabinet with IT platform
Controlled by single OpenStack instance in Campus Nord (VIM)

✓ 20MHz t 3,4GHz band and experimental EPC

1. Management of diverse slice-able access technologies

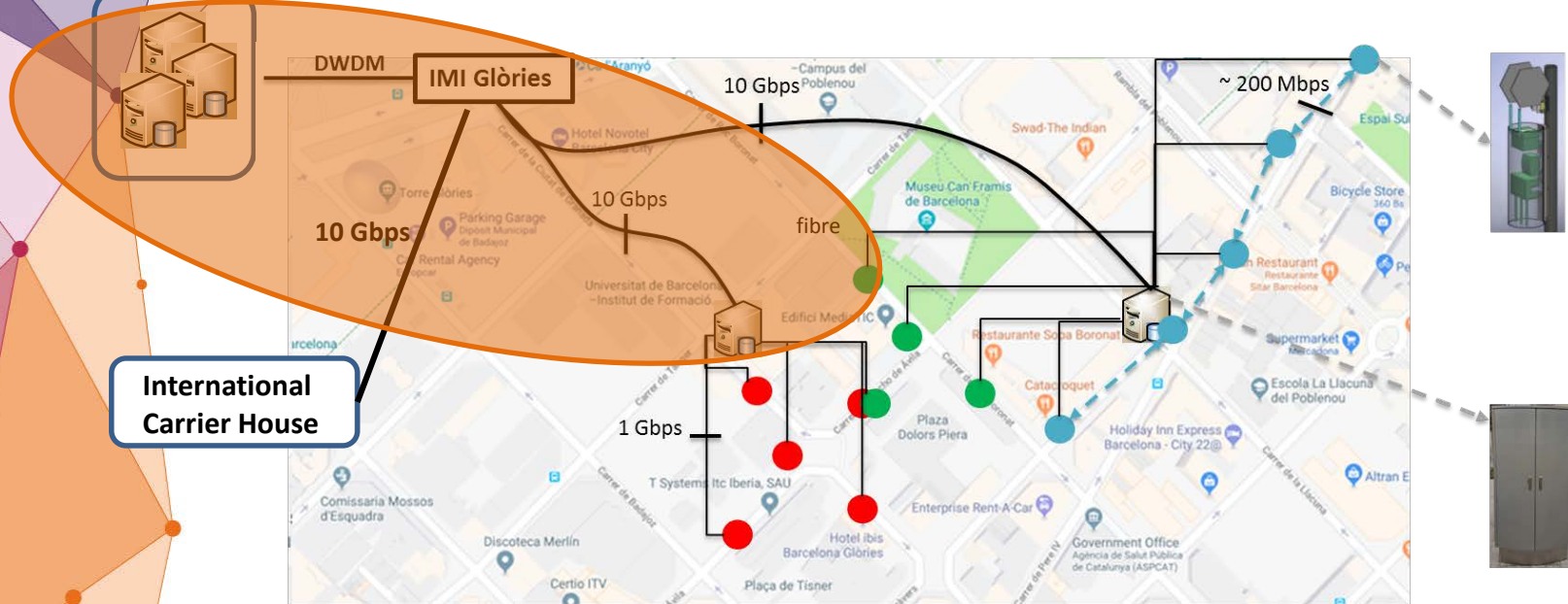


International Carrier House

RELATED ACTIVITIES IN 5G BARCELONA

- Developing SDN controllers for **remote slicing of WiFi Access Points** (isolation on physical layer)
- Efficient **small cell deployment without overloading** city spaces (via neutral hosting)
- Abstract modelling of access chunks/slices so that higher-layer **slice lifecycle management systems** can handle them **technology-independently**

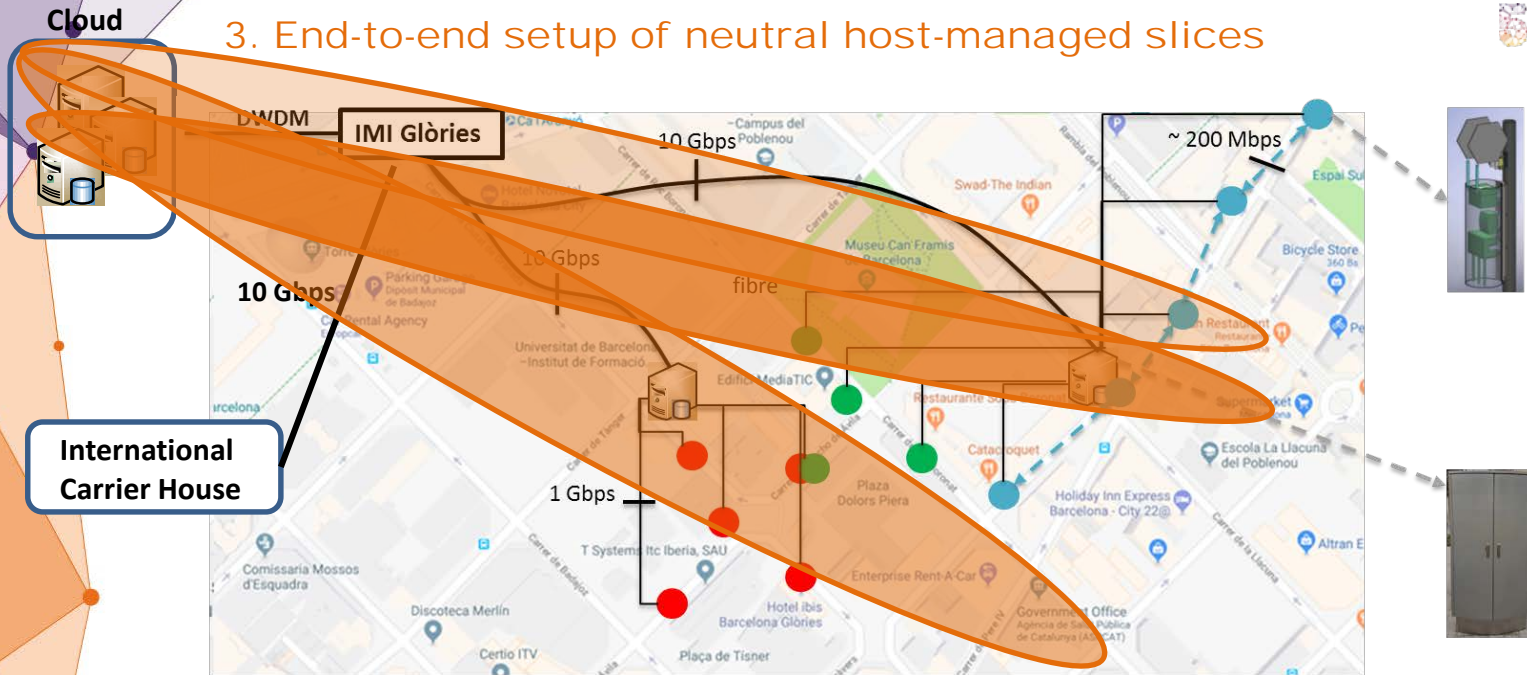
2. Multi-tier orchestration of virtualized network functions



RELATED ACTIVITIES IN 5G BARCELONA

- Addressing ETSI-identified open issues for combined NFV and MEC (Multi-access Edge Computing) orchestration
- Investigating combinations of technology stacks that enable the above efficiently
- Developing “common thin layers” (abstraction) on top of existing NFV and MEC orchestrators

3. End-to-end setup of neutral host-managed slices



RELATED ACTIVITIES IN 5G BARCELONA

- NFV **architectural extensions** to support slicing
- Specifying NFV-aware **slice lifecycle management procedures**
- Investigating new **slice information models**
- Experimenting with **testbeds that include slices for different verticals** (media, telecom, ...)



Knowledge & Trainings

MTAILS - MITIGATION TECHNIQUES FOR ADDRESSING THE IMPACT OF LATENCY ON SERVICES OVER SATELLITE NETWORKS

Future Preparations
Activity Code: 1B.118

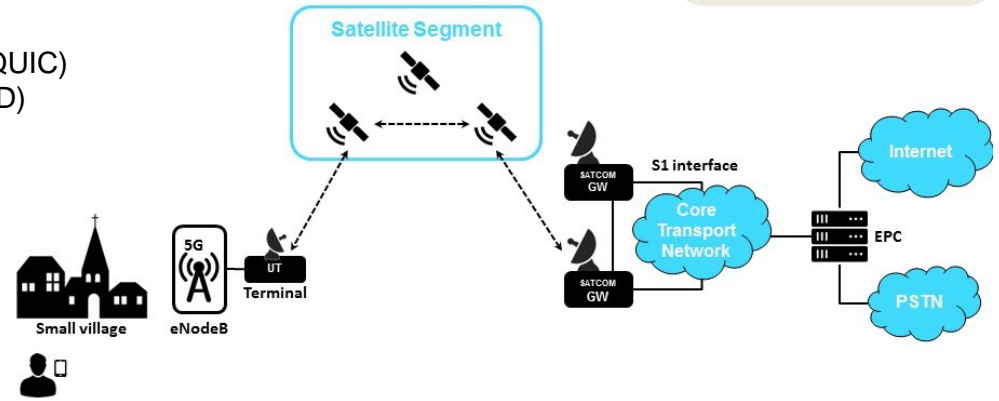


The project defines a set of **system scenarios** composed by the combination of satellite access networks (in all the range of orbit heights, covering **GEO, MEO, LEO** without ISL and LEO with ISLs) and two transport services: **broadband Internet access** and **5G cell backhauling**.

These scenarios performance are assessed by a **test bed** including **Indra AINE tool, PEPs, LoRa** and **applications**.

The project focuses on applications that are likely to be prevalent in the **2025 time horizon** and that may be especially **latency sensitive**:

- Web services (including HTTP/2 and QUIC)
- Streaming services (including 360° VoD)
- Online gaming
- Cloud virtual desktop services
- IoT backhauling



THANK YOU! ありがとうございます!



7th EU-Japan Symposium on ICT
Research and Innovation



Dr. Sergi Figuerola

CTIO, i2CAT

sergi.figueroa@i2cat.net | [@sfiguerola](https://twitter.com/sfiguerola)

M: +34.675.780.950