5G-PICTURE

5G Programmable Infrastructure Converging disaggregated network and compUte Resources

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On Behalf of the 5G-PICTURE consortium

Consortium Members

- IHP GmbH (Coordinator)
- University of Bristol
- ADVA Optical Networking
- Airrays GmbH
- Blu Wireless Technology
- CNIT
- COSMOTE
- EURECOM
- Fundació Privada i2CAT, Internet I Innovació Digital a Catalunya
- Telecom Italia S.p.A
- Zeetta Networks

- Mellanox
- Huawei Technologies Dusseldorf GmbH
- Technische Universität Dresden
- Transpacket
- Paderborn University
- COMSA INSTALACIONES Y SISTEMAS INDUSTRIALES SL
- Ferrocarrils de la Generalitat de Catalunya
- University of Thessaly

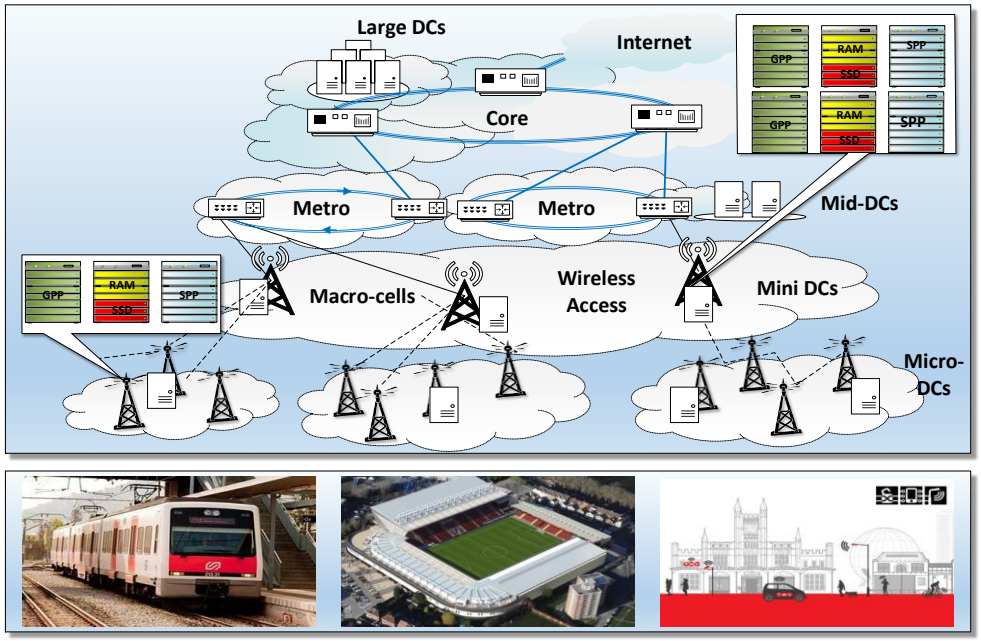
Universities (4x), Research Institutes (4x), SMEs (3x), Operators (3x), Industry partners (5x)

Main Objectives

- 5G-PICTURE will design and develop an integrated, scalable and open 5G infrastructure with the aim to support ***operational*** and ***end-user services*** for both ***ICT*** and '***vertical' industries***.
- This infrastructure will rely on a ***converged fronthaul*** and ***backhaul*** solution, integrating advanced wireless access and novel optical network domains.
- To address the limitations of current solutions 5G-PICTURE will adopt the novel concept of ***Disaggregated-Radio Access Networks*** (DA-RANs)
  - allows any service to flexibly ***mix-and-match*** and use ***compute,*** storage and ***network resources*** through ***HW programmability***
  - relies on network '***softwarisation'*** to enable an open reference platform instantiating a variety of network functions
  - adopts ***slicing*** and ***service chaining*** to facilitate optimised ***multi-tenancy*** operation

Concept

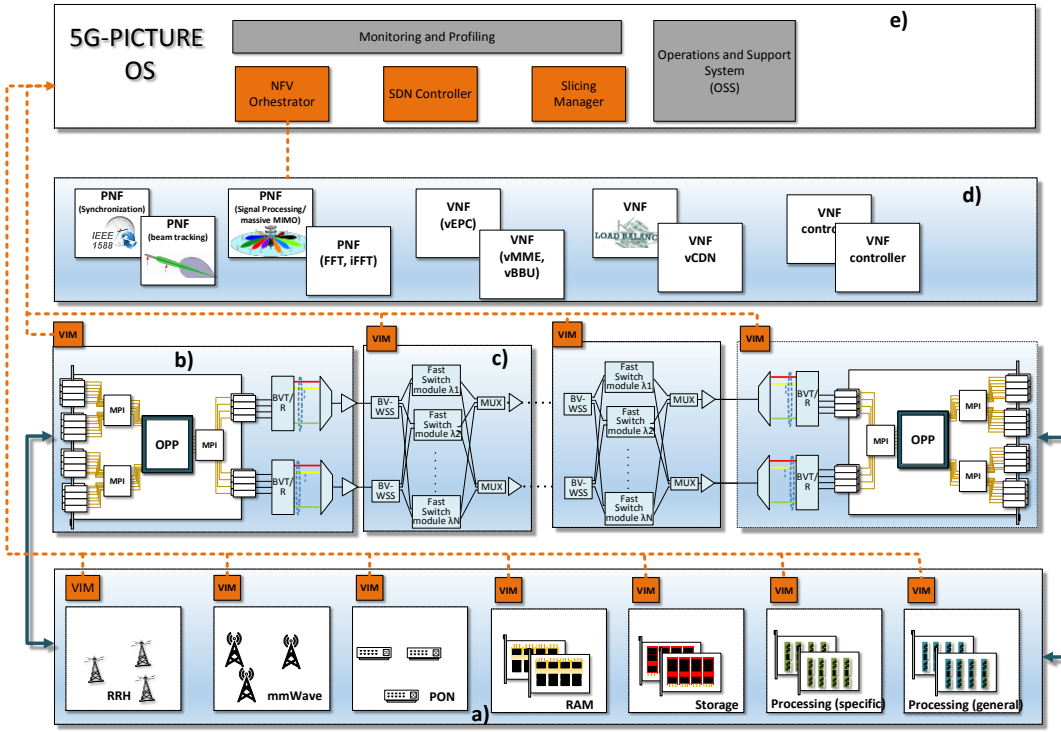
- 5G-PICTURE proposes to integrate network and compute/storage resources in a common infrastructure.
- Hierarchical compute & storage structure supported by a network hierarchy
- Integrated programmable wireless technologies at the edge and a hybrid passive/active optical transport network



- Extensive demonstration activities to showcase ICT and vertical industry use cases
  - Converged fronthaul and backhaul services in a smart city test-bed (city of Bristol, UK)
  - Seamless service provisioning and mobility management in high speed railway environments - 5G railway experimental testbed (Barcelona, Spain)
  - Media services supporting large venues with increased density and static-to-low mobility - stadium test-bed supporting large venues (Bristol, UK)

Technical Approach

- To address the limitations of D-RAN and C-RAN, we will develop flexible functional splits
- Adoption of the notion of DA-RAN relying on resource disaggregation
  - mixing-and-matching of resources
- Development of novel technology solutions and control & management platforms
  - enhanced network and compute HW and SW modularity and flexibility
- Creation and deployment of programmable network functions and intelligent orchestration schemes
  - service chaining
  - slicing & multi-tenancy



Inter-project cooperation

WG 5G Pre-standardization WG – 5G IA
- Facilitator: Olav Queseth, Ericsson

WG 5G Spectrum – 5G IA
- Facilitator: Terje Tjelta, Telenor

WG NetMgmgt & QoS – 5G-PPP
- Facilitator: Michael Barros, TSSG Wateford

WG SME – Networld2020
- Facilitator: Jacques Magen, Interinnov

WG Vision and Societal Challenges WG- 5G IA
- Facilitator: Salaheddine Elayoubi, Orange

WG Security – 5G-PPP
- Facilitator: J-P Wary, Orange, Pascal Bisson, Thales

WG Trials – 5G IA
- Facilitator: Didier Bourse, Nokia

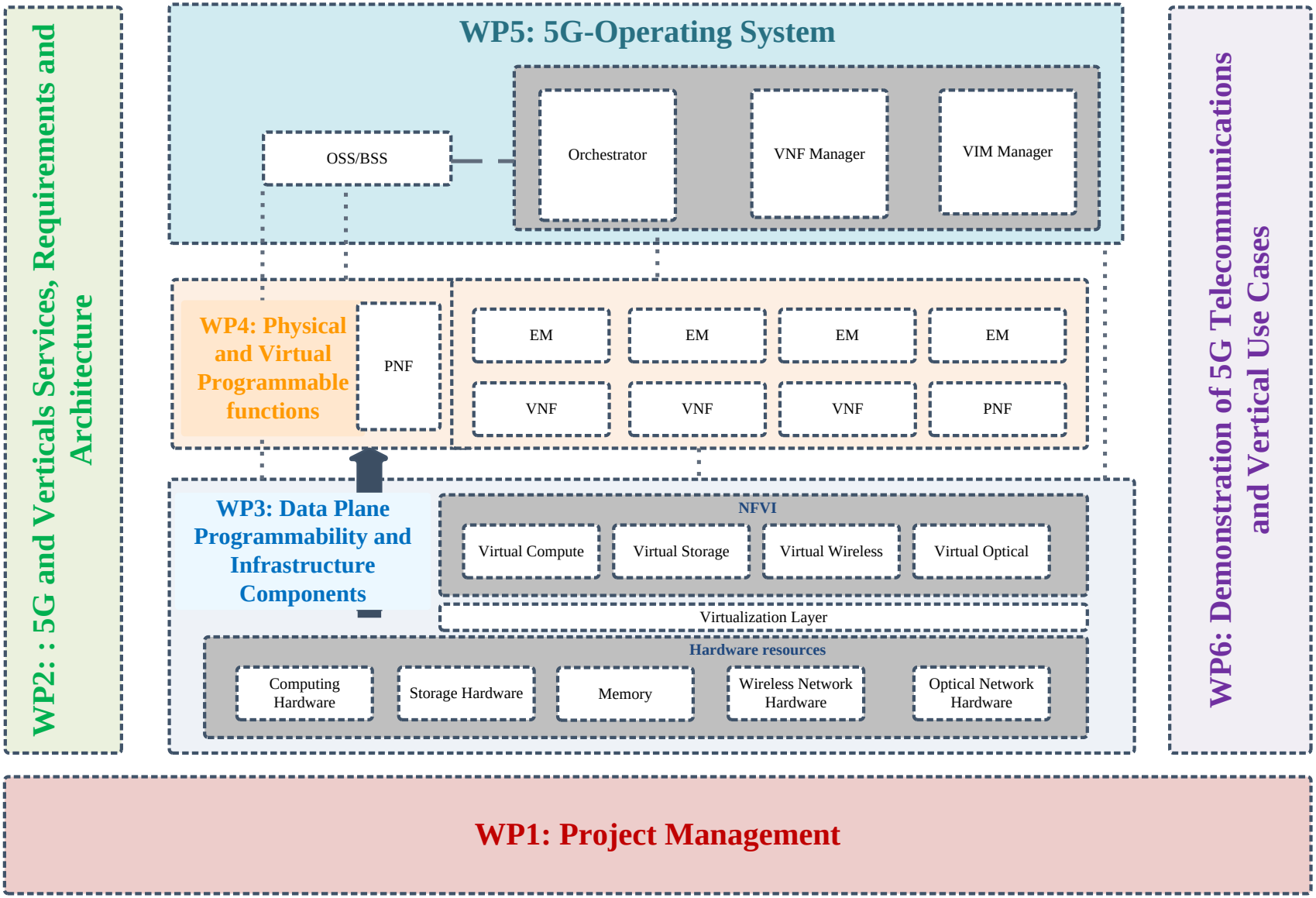
WG 5G Architecture – 5G-PPP
- Facilitator: Simone Redana, Nokia

WG Software Networks (SDN,NFV) – 5G-PPP
- Facilitators: Josep Martrat, Atos; Carlos Jesús Bernardos, UC3M

Collaborations with other Phase-I & Phase II 5G PPP projects-

- 5G-XHaul, Phase I
- mmMAGIC, Phase I
- 5G-Crosshaul, Phase I
- METRO-HAUL, Phase II
- 5G-Transformer, Phase II
- Sat5G, Phase II
- … t.b.d.

Work Organisation



Timeline, Use-Cases & Validation