Altice Labs 5G activities

IEEE 5G Summit
Portugal, Lisbon, ISCTE

Luis Miguel Silva

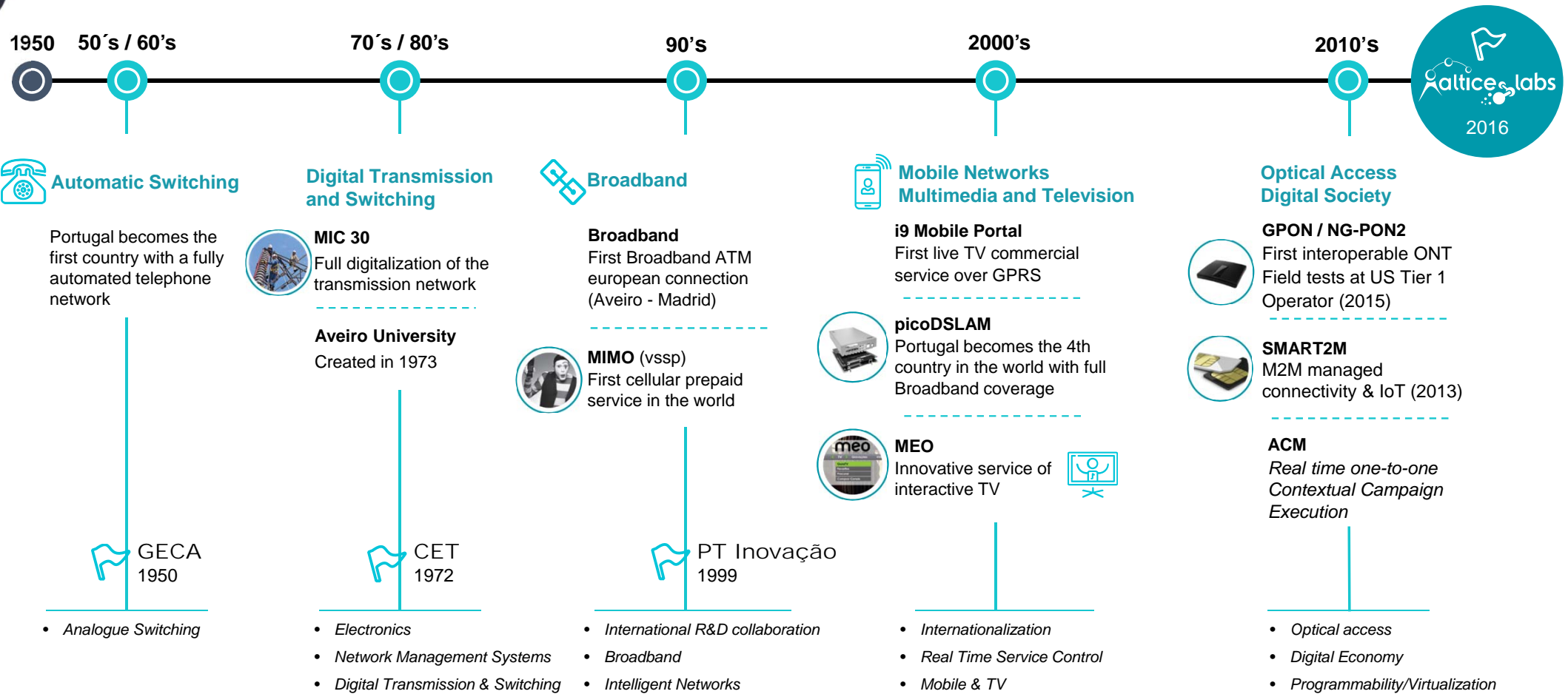19 January 2017

![Altice labs logo]

Altice labs is an Information and Communications Technology company belonging to the Altice Group, a multinational telecommunications, content and media group.

Our **mission** is to support our customers building technological innovation and creating value.
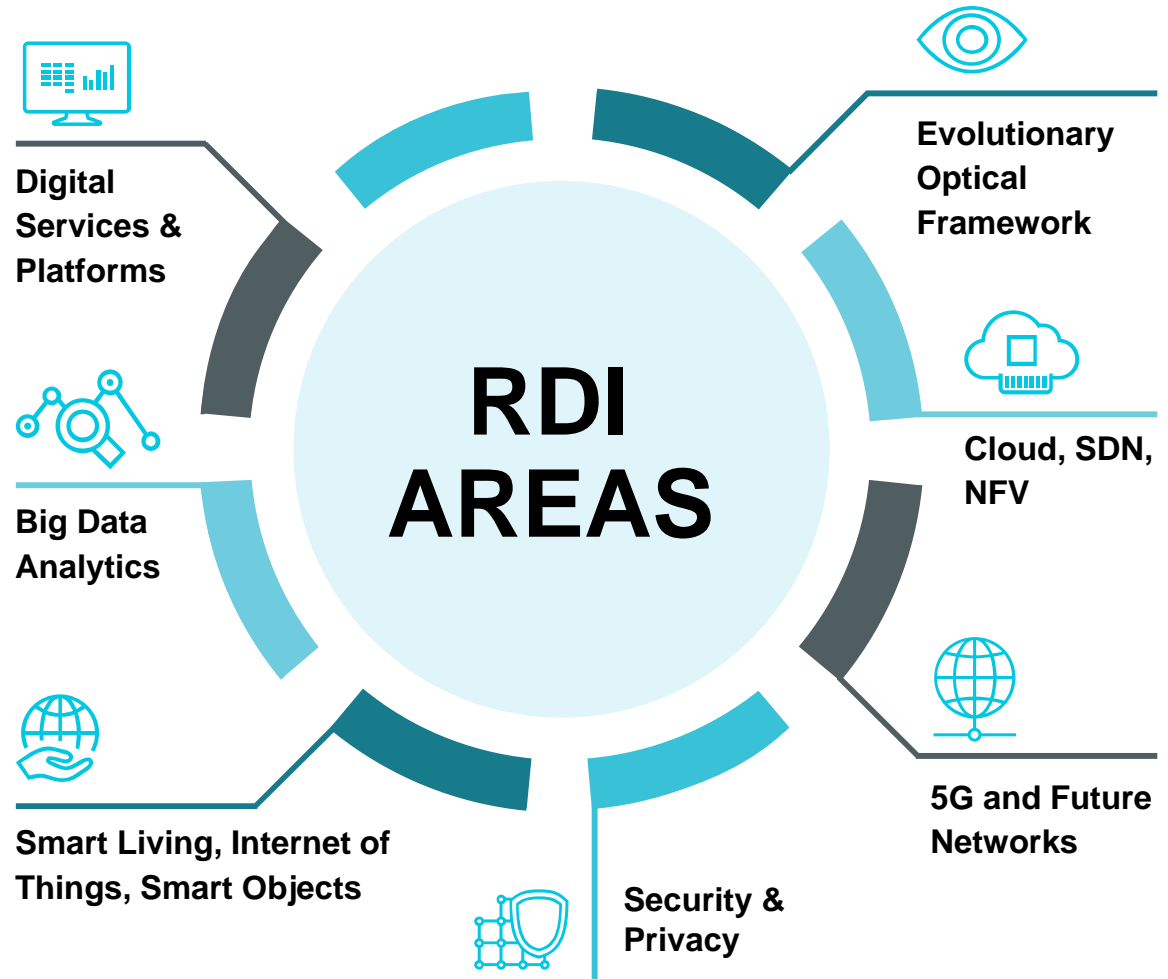
We do this by promoting a process of innovation, supported on an ecosystem around R&D entities, start-ups and industrial partners, turning knowledge into competitive advantage.

Team Spirit

OUR VALUES

To Know and to Do

Commitment

Creativity and Innovation

Excellence
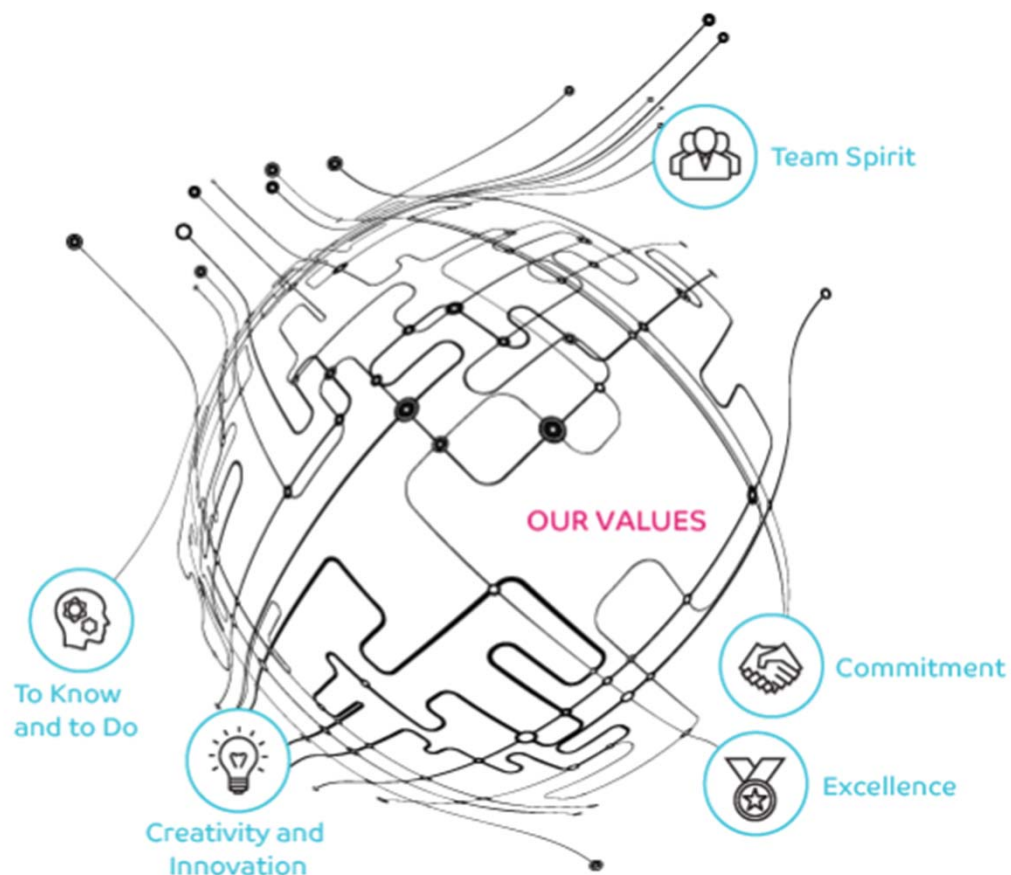
The history of **Altice Labs** is linked to the portuguese telecommunications sector evolution

| 1950 | 50´s / 60's | 70´s / 80's | 90's | 2000's | 2010's | altice labs 2016 |

Automatic Switching

Portugal becomes the first country with a fully automated telephone network

GECA
1950

- *Analogue Switching*

Digital Transmission and Switching

MIC 30
Full digitalization of the transmission network

Aveiro University
Created in 1973

CET
1972

- *Electronics*
- *Network Management Systems*
- *Digital Transmission & Switching*

Broadband

Broadband
First Broadband ATM european connection (Aveiro - Madrid)

MIMO (vssp)
First cellular prepaid service in the world

PT Inovação
1999

- *International R&D collaboration*
- *Broadband*
- *Intelligent Networks*

Mobile Networks Multimedia and Television

i9 Mobile Portal
First live TV commercial service over GPRS

picoDSLAM
Portugal becomes the 4th country in the world with full Broadband coverage

MEO
Innovative service of interactive TV

- *Internationalization*
- *Real Time Service Control*
- *Mobile & TV*

Optical Access Digital Society

GPON / NG-PON2
First interoperable ONT Field tests at US Tier 1 Operator (2015)

SMART2M
M2M managed connectivity & IoT (2013)

ACM
Real time one-to-one Contextual Campaign Execution

- *Optical access*
- *Digital Economy*
- *Programmability/Virtualization*

RDI Strategic AREAS (2015-2017)

Digital Services & Platforms

Big Data Analytics

Smart Living, Internet of Things, Smart Objects

RDI AREAS

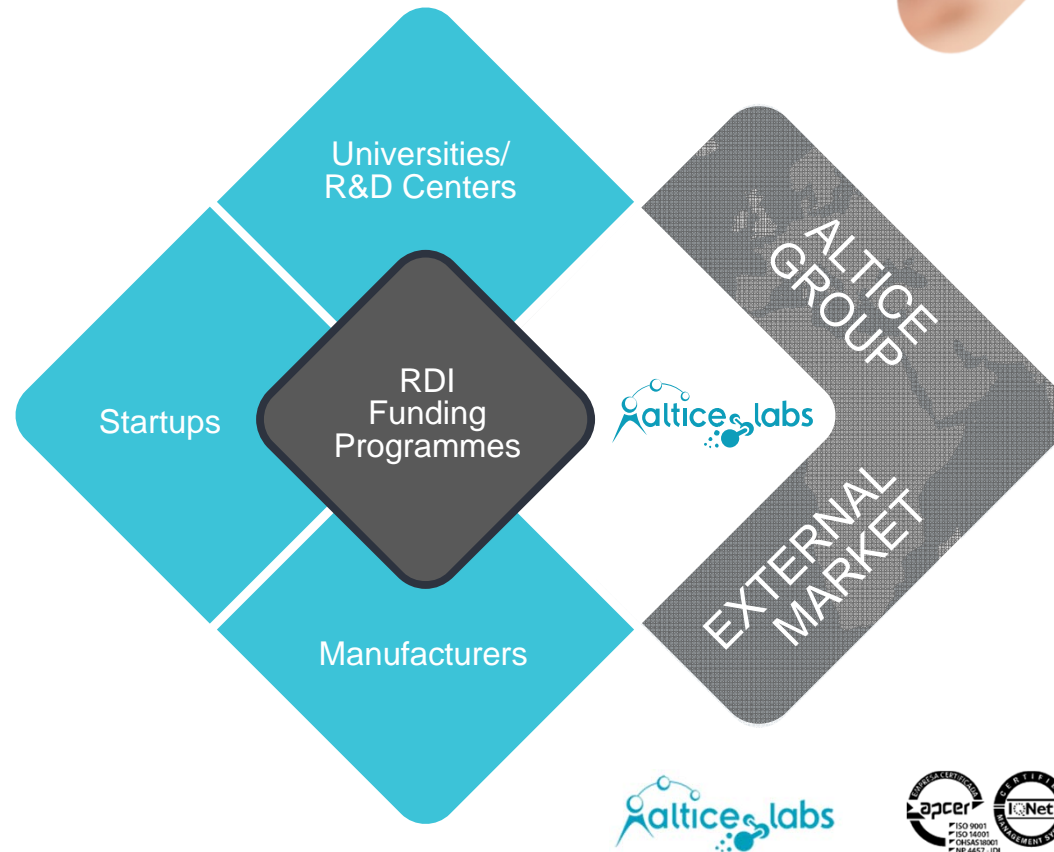**Evolutionary Optical Framework**

Cloud, SDN, NFV

5G and Future Networks

Security & Privacy

RDI in Collaboration

We continuously engage in collaborative Research, Development and Innovation projects as part of our sustained strategy for technological leadership.

Universities/ R&D Centers

Startups

Manufacturers

RDI Funding Programmes

altice labs

ALTICE GROUP

EXTERNAL MARKET

altice labs

apcer
ISO 9001
ISO 14001
OHSAS18001
NP 4457 - IDI

IQNet

Telco 2020
Evolutionary vision

The Telco 2020, is a result from the encountering of the traditional telco and cloud environments, benefiting from complementary visions and joint offer, with SDN and NFV having a major role in this transformation.
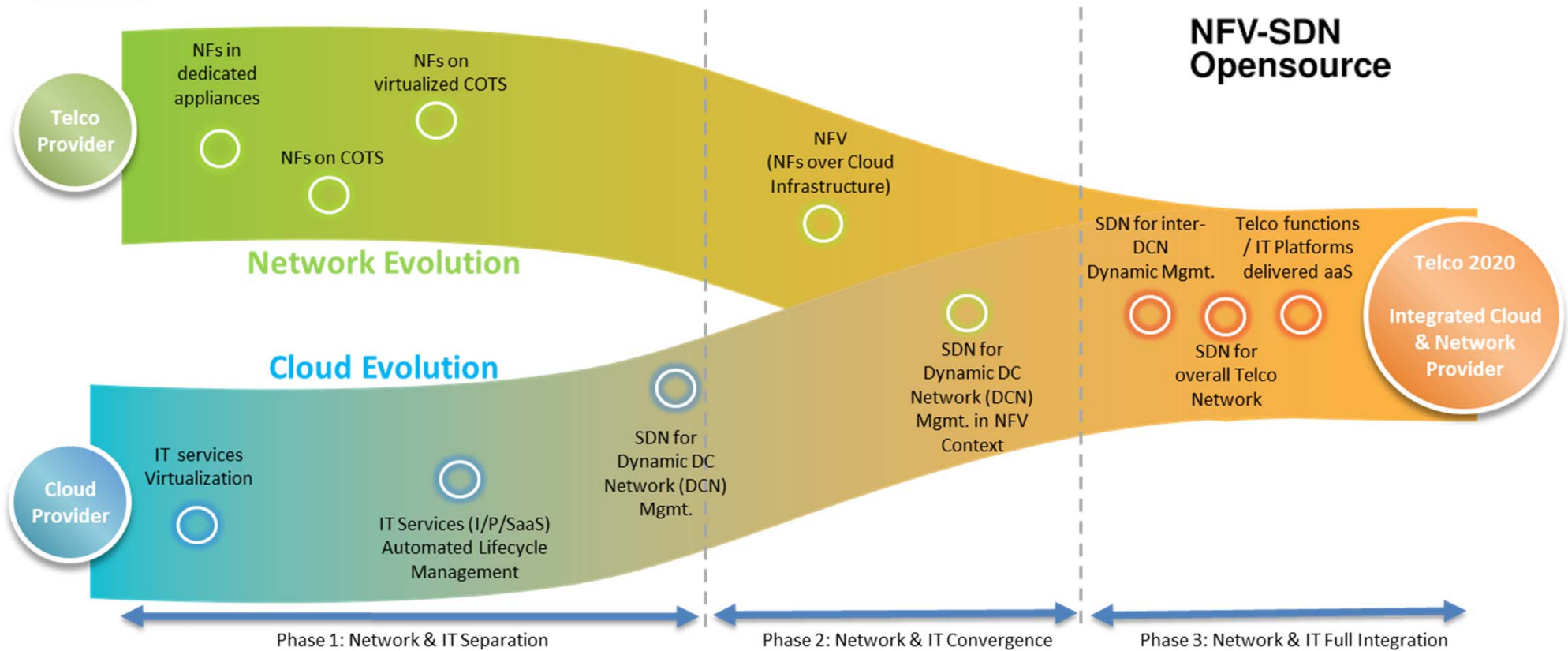
AlticeLabs H2020 5G PPP Active Projects

Superfluidity: A super-fluid, cloud-native, converged edge system

The project aims at achieving superfluidity in the network: the ability to **instantiate services on-the-fly, run them anywhere in the network** (core, aggregation, edge) and **shift them transparently to different locations**.

SONATA: Service Programming and Orchestration for Virtualized Software Networks

SONATA is realizing an **extended DevOps model for network stakeholders**. SONATA validates its approach through novel use-case-driven pilot implementations and disseminates its results widely by releasing its key SDK and platform components as open source software

SELFNET: Framework for self-organized Network Management in virtualized and software defined Networks

Design and implement an **autonomic network management framework** to achieve self-organizing capabilities in managing network infrastructures by automatically detecting and mitigating a range of common network problems that are currently still being manually addressed by network operators

CHARISMA: Converged Heterogeneous Advanced 5G Cloud-RAN Architecture for Intelligent and Secure Media Access
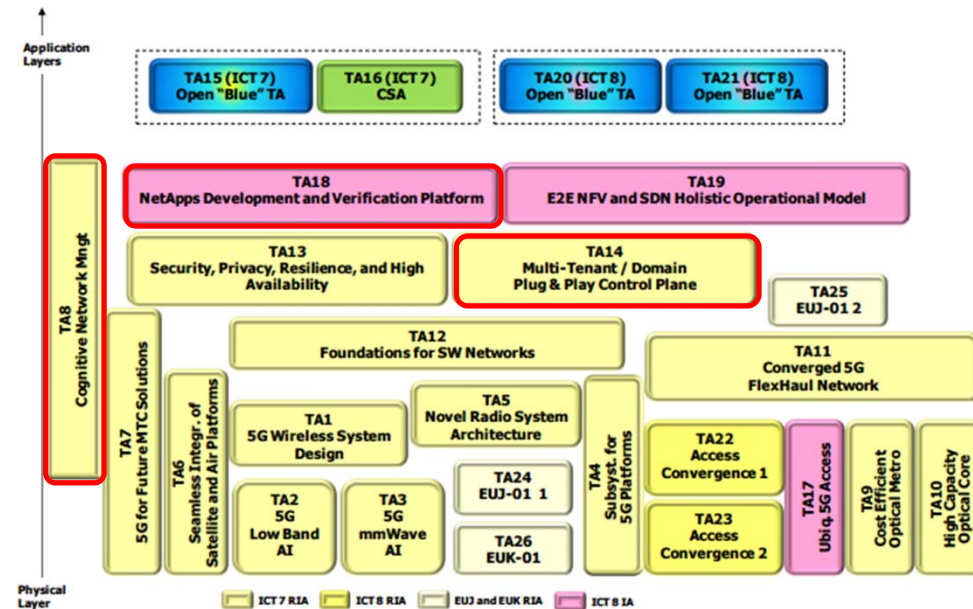
CHARISMA proposes an intelligent **hierarchical routing and para-virtualised architecture** that unites two important concepts: devolved offload with shortest path nearest to end-users and an end-to-end security service chain via virtualized open access physical layer security (PLS).

SUPERFLUIDITY

sonata

Selfnet

CHARISMA

AlticeLabs H2020 5G PPP phase 2 New Projects (under evaluation)

5G-SCALED	Network Slicing
5GTANGO	DevOps applied to SDN/NFV, focus in VNFs verification and validation
MicroNFV	DevOps applied to SDN/NFV, focus in service specification optimization, for better network performance
UNICON	Unified Control in a SmartAnywhere Environment
SANDSTONE	Virtualization and edge computing; management and orchestration
5GSURVIVE	Virtualization, orchestration and resiliency
SLICENET	Orchestration and management of multi-domain slices
LOCUS	5G location
5GIRIS	In-building wireless communications, based on cloud radio-access networks.

AlticeLabs P2020 "5G", "Mobilizadores" program

Integrated design and validation of a set of products capable of being part of and providing services within the ecosystem of future 5G networks,

gathering and harmonizing the efforts of different technology companies in the telecommunications area, for both B2B and B2C models.

Consortium   14 portuguese institutions, lead by Altice Labs

Organization   PPS1: Products and Services for the **Network Edge**
PPS2: Products and Services for the **Network Core**
PPS3: Products and Services for **M2M Communication**
PPS4: Products and Services for **Human Communication**
PPS5: Results integration and demonstration

Numbers   36 months
306 PM
10 M€

AlticeLabs Products Roadmap

Altice Labs is evolving its products portfolio to cope with 5G demands and new supporting technologies

New access: Ethernet Fronthaul solution, based on AlticeLabs xPON optical platforms

- Coexistence of front haul and accesses, on an optical access infrastructure (e.g. NG-PON2) – Fixed Mobile convergence
- Evolution of CPRI to more flexible and efficient protocols: allow radio signals over packet networks (NG-PON2)
- Evolution of compression algorithms for "radio data" in order to reduce the fronthaul rates required by the I&Q radio samples.

OSS: support the 5G future mode of operations
- Sensing of service and network conditions from all service layers
- Near real time and non real time analytics
- Intelligent automated decision mechanisms

Policies: e2e policy management in a fully programable network environment
- Network will be extremely automated and programmable
- Coherent policies at all network segments and layers are need in order to guarantee a smooth and efficient operation
- Provide support to a distributed policy enforcement, having SDN and NFV as *policy enablers*

5G experiments
Aveiro environment

📅 **2017 –**

altice labs

it

universidade de aveiro

Vendors;
ICT SMEs

P T

Aveiro
5G Testbed

5G
Industrial Internet

PORTUGAL 2020

HORIZON 2020
THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

5G PPP

Telecom Industry

ICT SMEs

European R&D