



Nome: Content Providers meet Access Providers

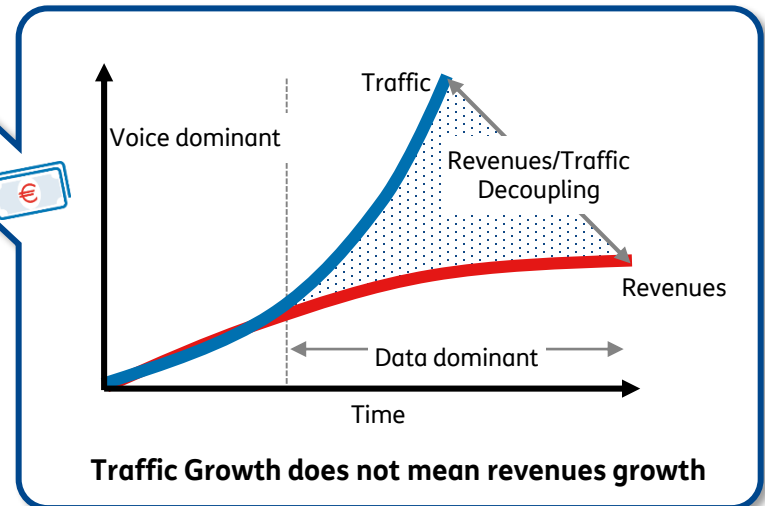
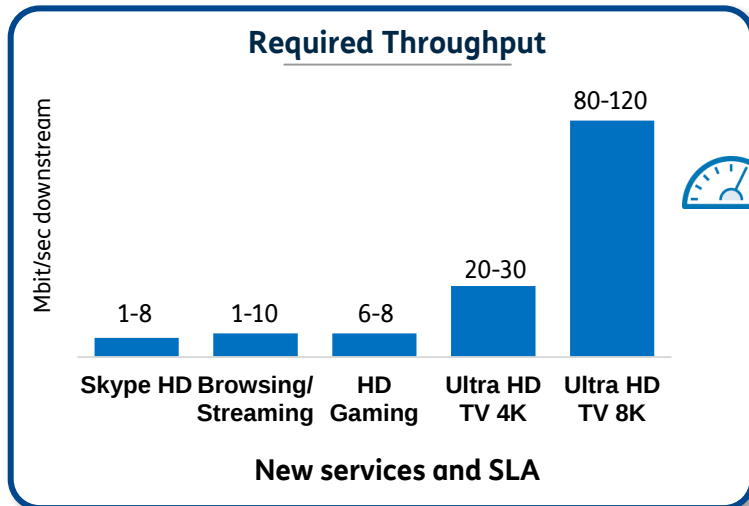
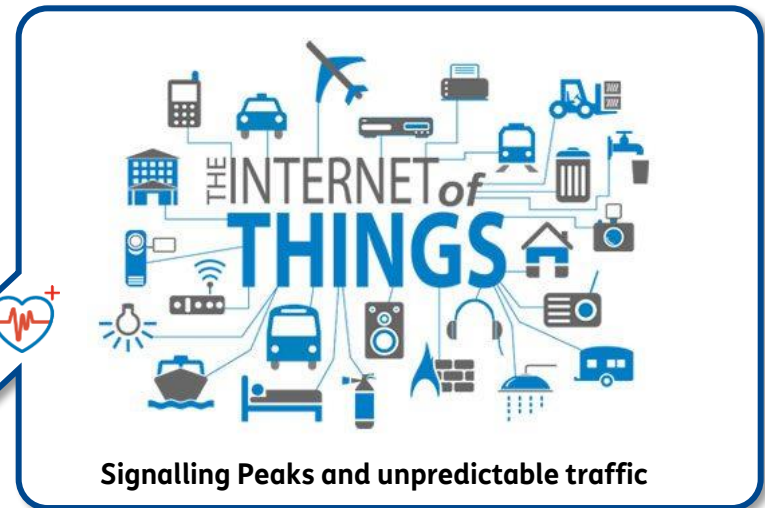
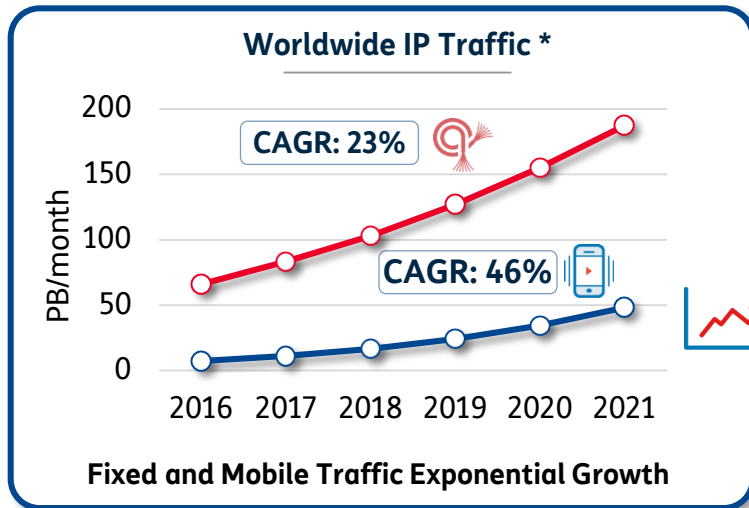
TIM, a Transforming Company

Michele Gamberini

3 luglio 2017



Transformation is needed to unhinge Telco paradox



A Transforming Company, Industrial Plan Paradigms

Quality to fully
exploit business
opportunities



BEST INFRASTRUCTURE
AND COVERAGE



NEW COMMERCIAL
APPROACH



- CASH FLOW
- DELEVERAGE
- VALUE CREATION

Company Culture
change:
from complex to
agile, fast and
effective

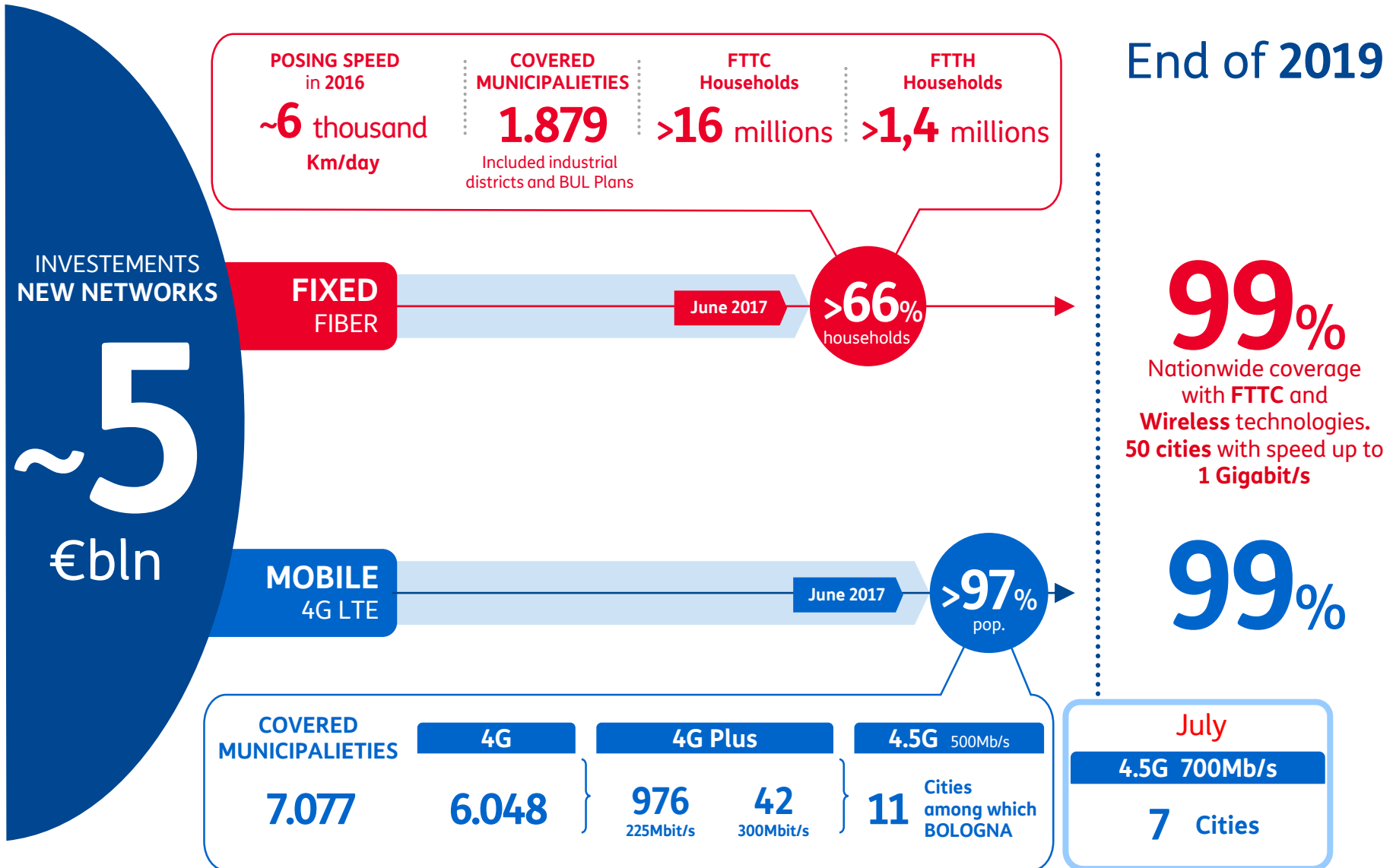


EFFECTIVENESS
AND EFFICIENCY

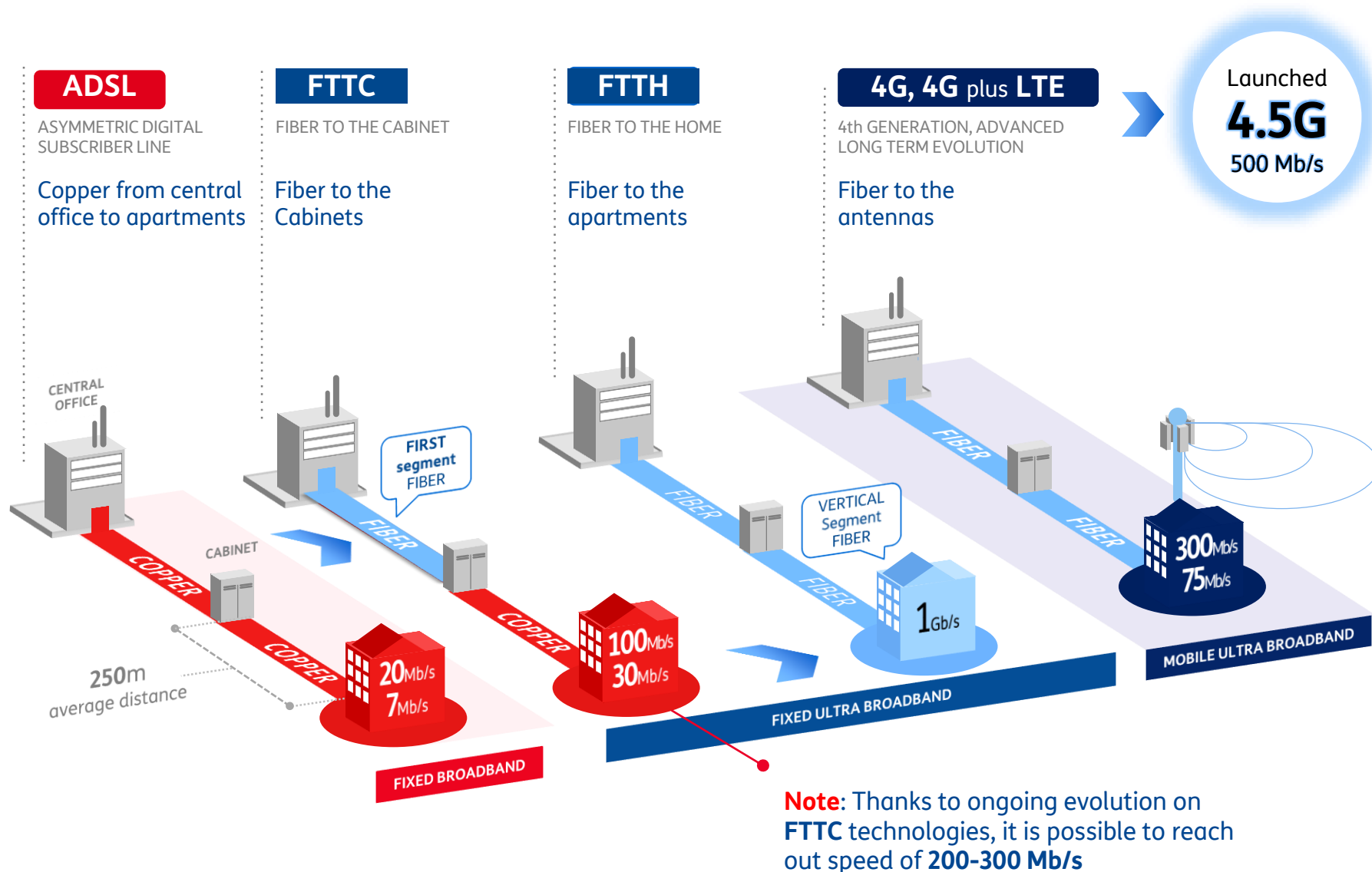


RELAUNCH OF
SUBSIDIARIES

Ultrabroadband Coverage TIM Plan in Italy



Fixed and Mobile Ultrabroadband Access Technologies



How new digital network will appear

LEAN, FAST & SCALABLE

OPEN &aaS

**Network
Automation**

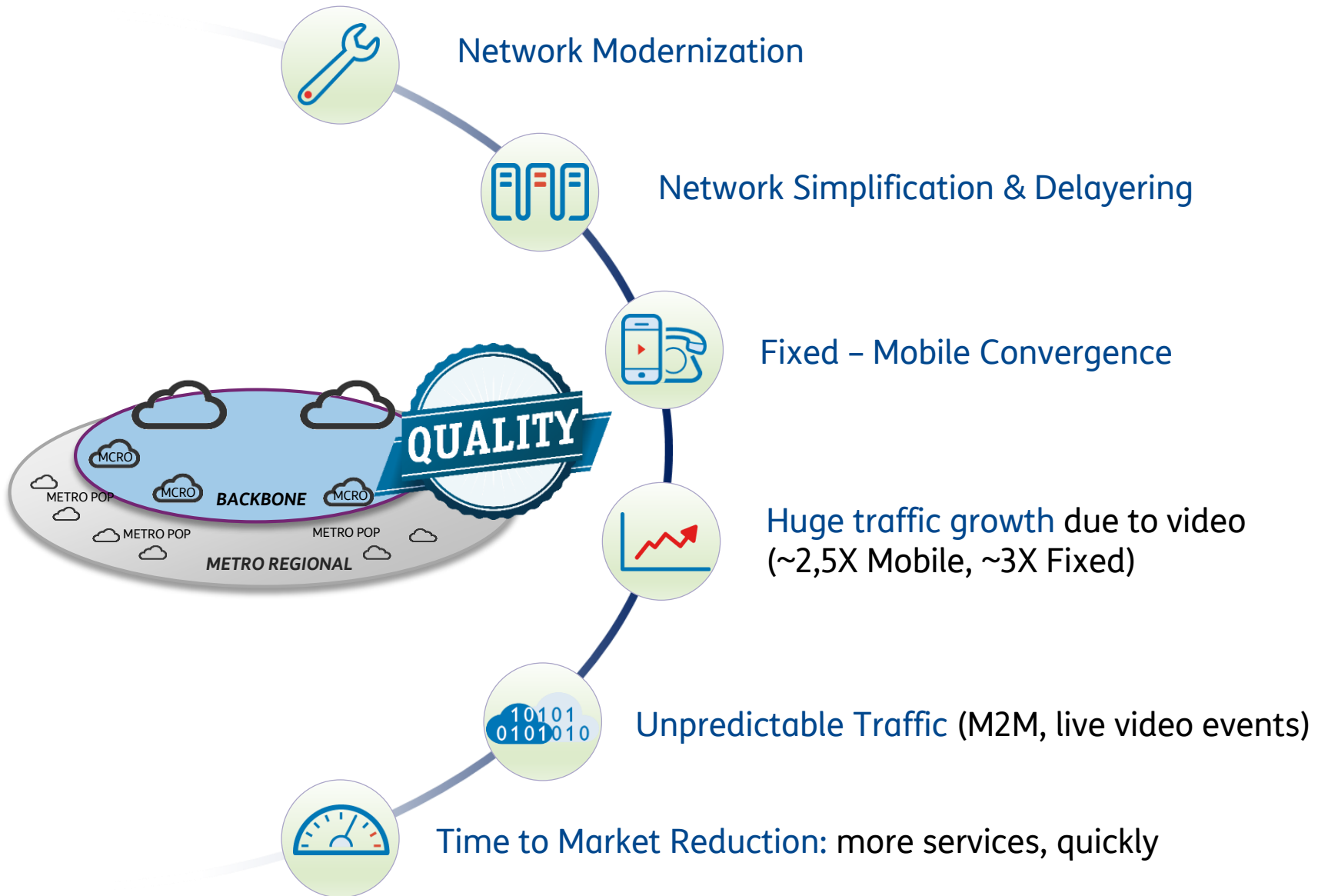
IP NATIVE
HIGH QoE

PROGRAMMABLE
& SW DEFINED

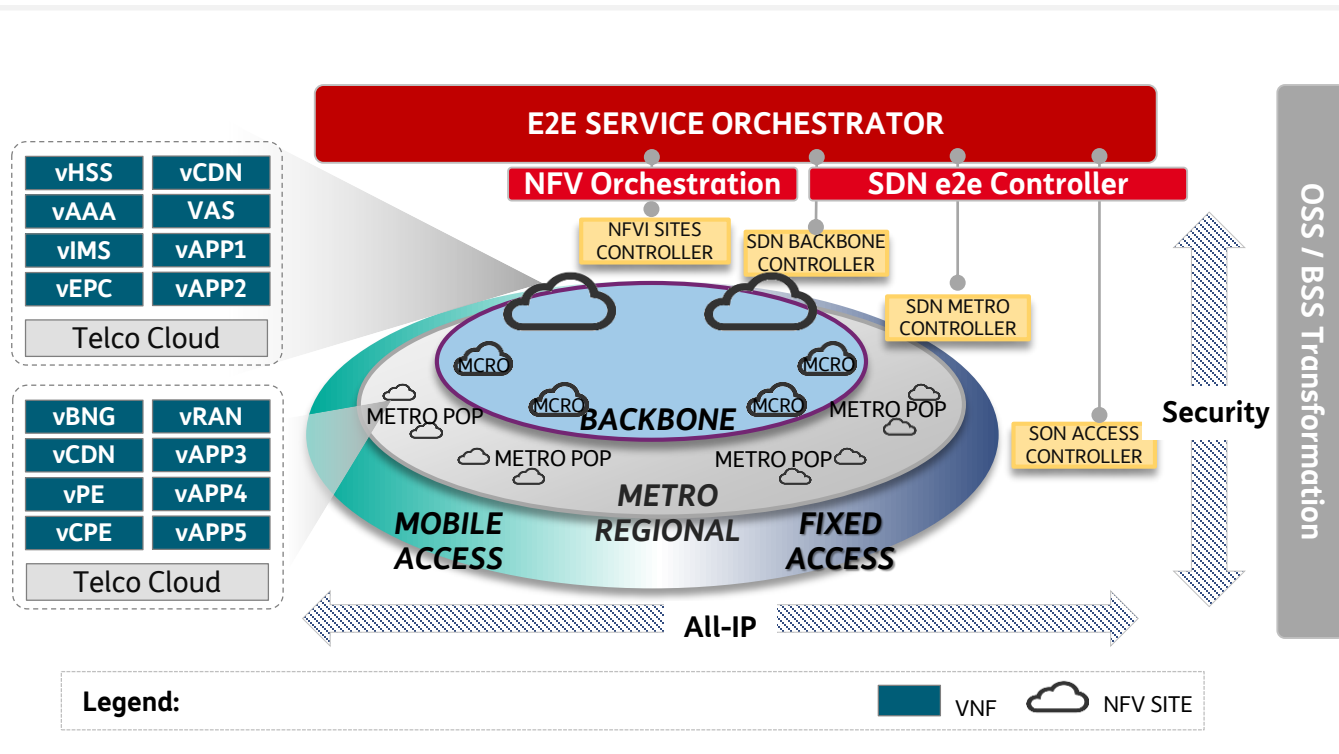
FULLY
VIRTUALIZED

Digital Skills and DevOps operating model

Network platforms transformation (without Access)



SDN and NFV integrated with the Network



- 1 NFV Sites deployed on different network levels (mini, micro, pico DC)
- 2 Spread of controllers (SON, SDN) for automated network
- 3 Two orchestration levels for e2e control
- 4 API availability for each network architecture level



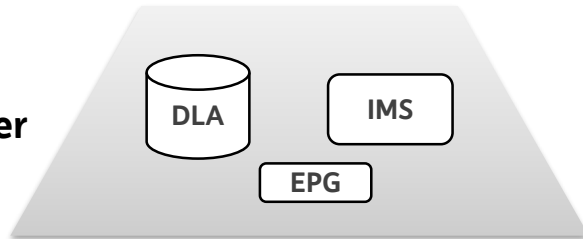
- **Short cycles of release** (Waves) with clear and coherent perimeters (DevOps)
- **Incremental Development Functionality** on VNF with business requirements
- Processes and Releases Tuning with continuative improvement

Core, Metro and Transport Network vs Quality

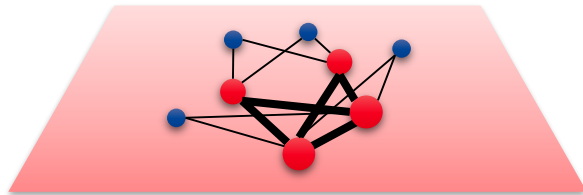
Content
Provider



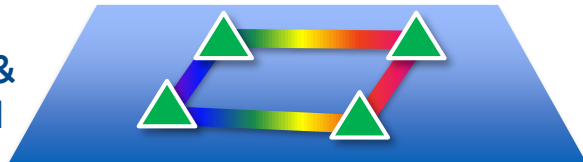
Control &
Service Layer



Core IP &
Metro IP



Core WDM &
Metro WDM



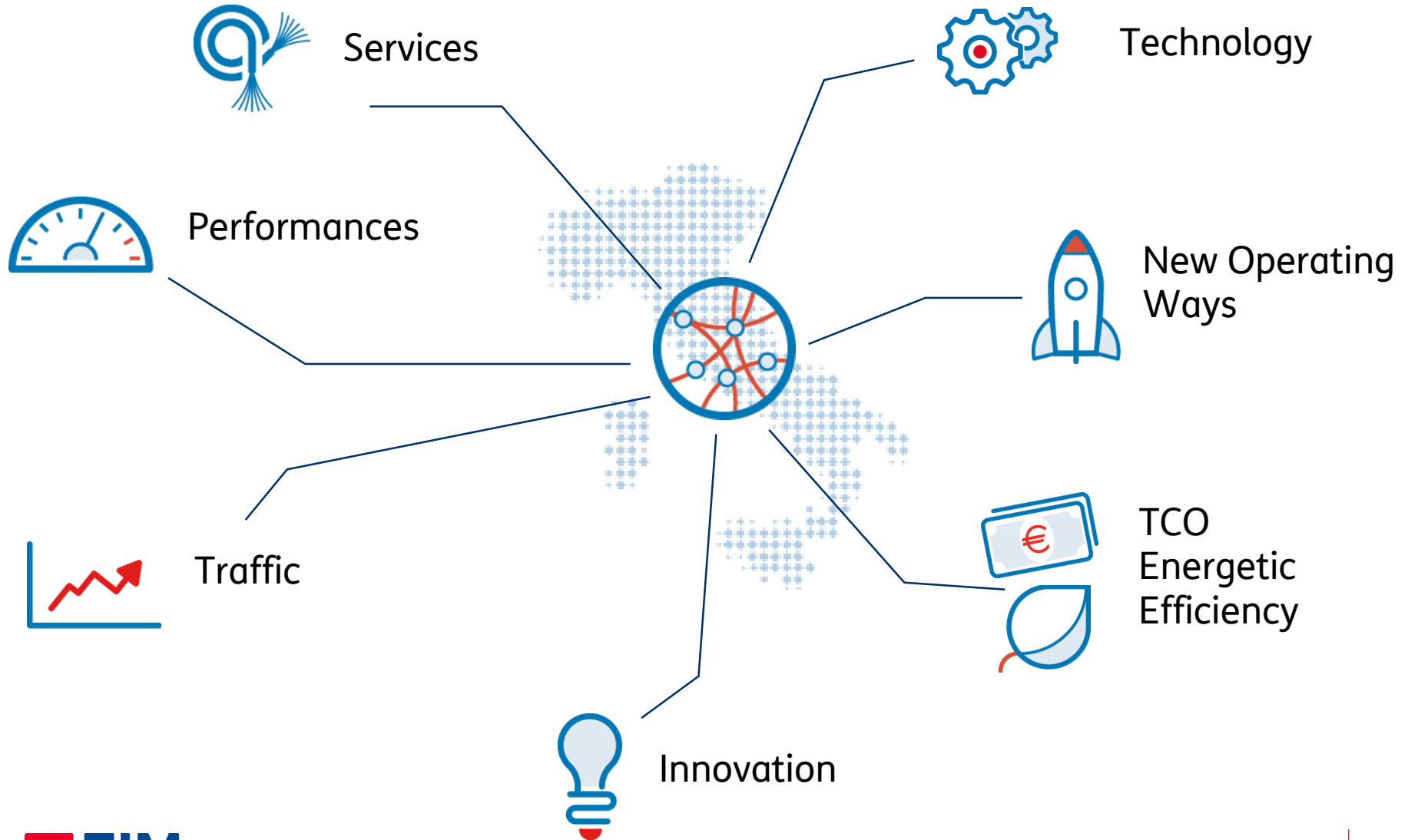
IP and WDM Transport must be designed to minimize e2e latency without bottlenecks



Italian Physical geography makes the game harder: Italy is narrow and stretched with only 3 physical ways between South and North.

Barycentric Role of Namex

Transformation Driver of IP and WDM Core Network



How to transform WDM Core Photonic Transport



OTN



100-200 Gbps



Doubling Infrastructures in 2 years



ROADM Colorless-Directionless-Contentionless / Flexgrid



T-SDN ready
IP + Optical Integration



400G ready



Compact Systems with High Density and Energetic Efficiency



kaleidon 2
p h o t o n i c b a c k b o n e

Kaleidon 2 Evolution



New national photonic network

Fully ROADM

Spread on 48 PoP

> 13.000 Km optical Fiber

> Optimized on physical layer (o. f.)

> Optimized on upper IP layer

How to transform IP Core Transport



5G Services / High quality video



Latency Minimization / Reliability Increase



Doubling IP Traffic in 2 years



New Generation
Petarouter carrier-class



SDN ready
IP + Optical Integration



High Energetic Efficiency Devices
($<0,5\text{W/Gbps}$)



NGCN

Next Generation Core Network

New IP backbone network

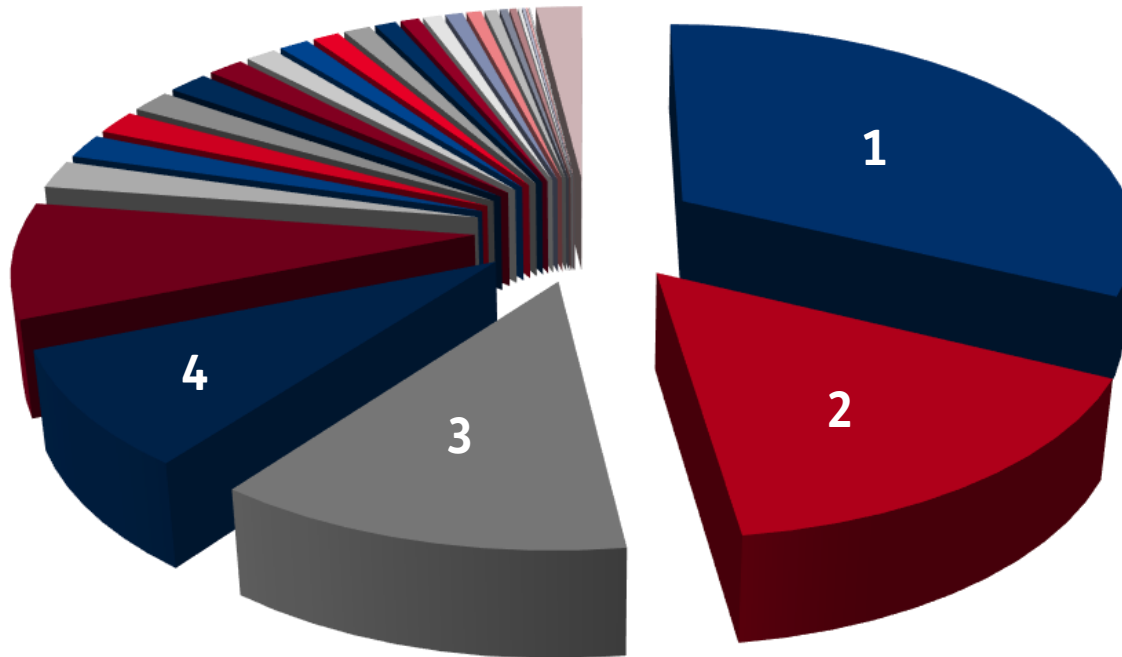
Spread on 8 + 25 PoP

Fully redundant

Optimized on fixed and mobile
services

All Infrastructures to 100 Gbps

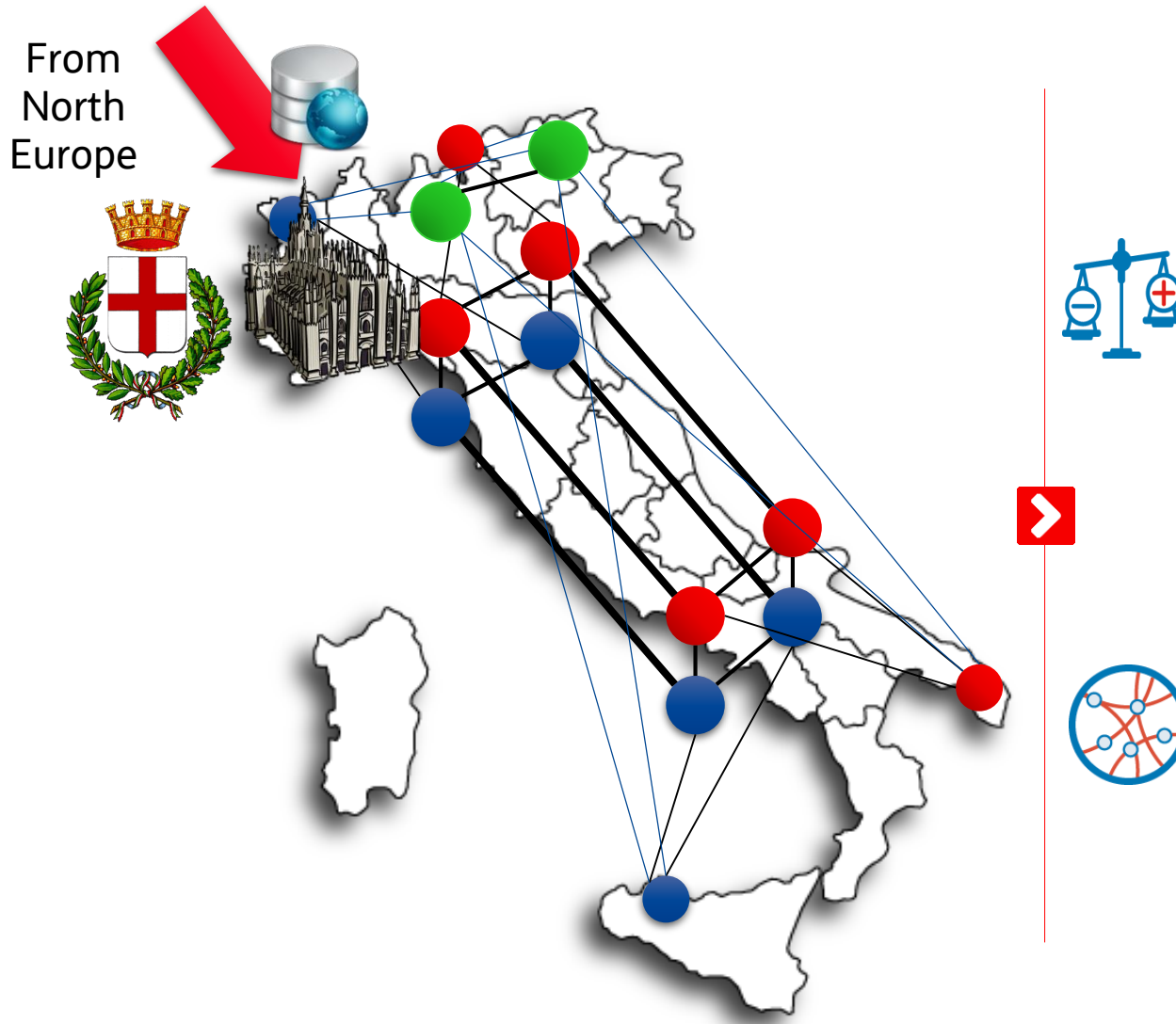
TIM incoming traffic qualitative distribution



4 OTT directly interconnected with Telecom Italia networks (TIM + Sparkle).

As of now, there is interconnection through Sparkle or directly on TIM but only on Milan

International Traffic Flows and Interconnection Points

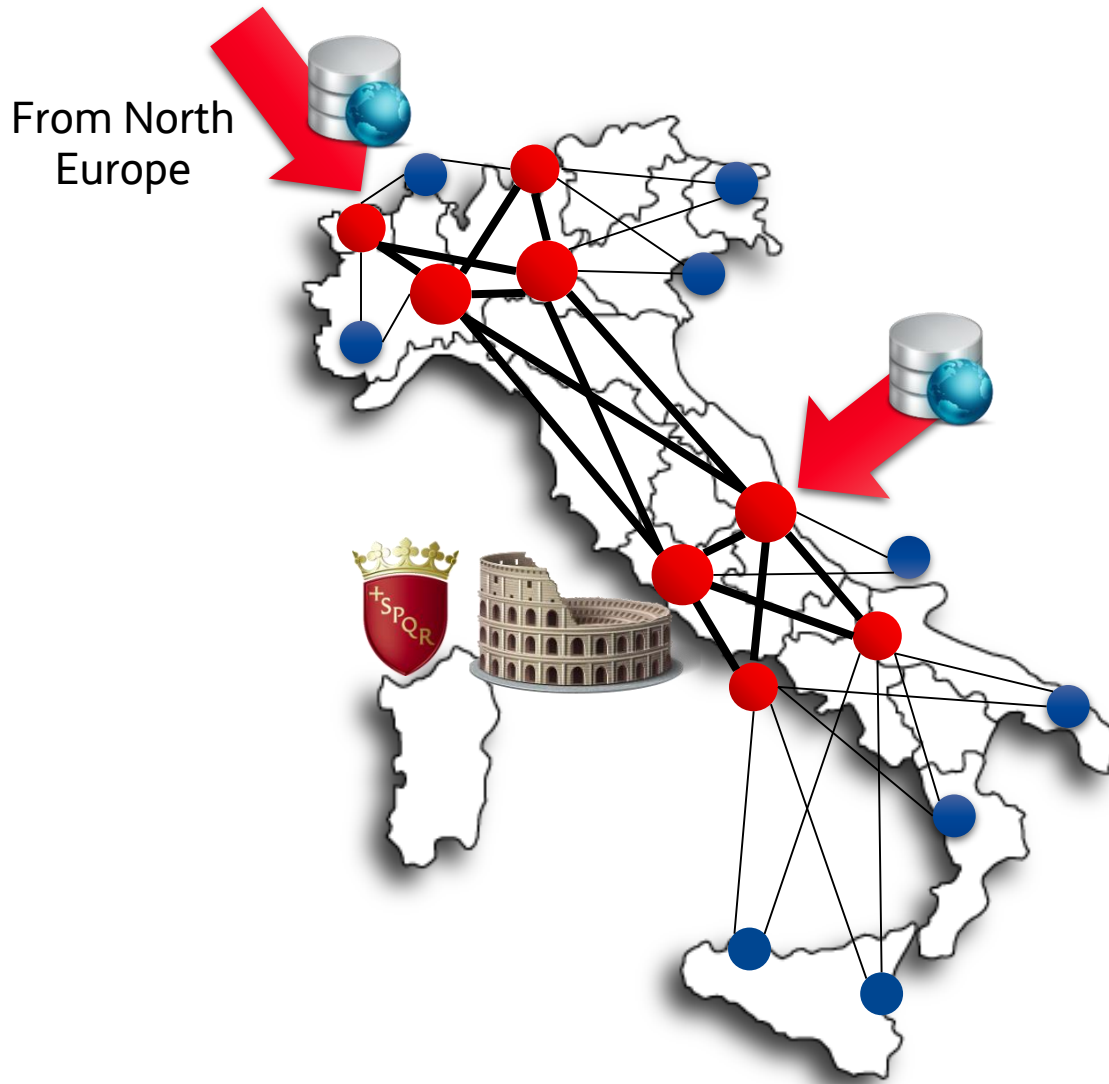


The North-South misalignment caused in years a Milan-Centric polarization of interconnection of current IP OPB network



As of now, OPB National IP Network is structured to distribute traffic flows from Milan towards the rest of Italy

Architectural evolution and Interconnection opportunities (I)



The new Core IP NGCN network is symmetric and barycentric compared to RM and MI

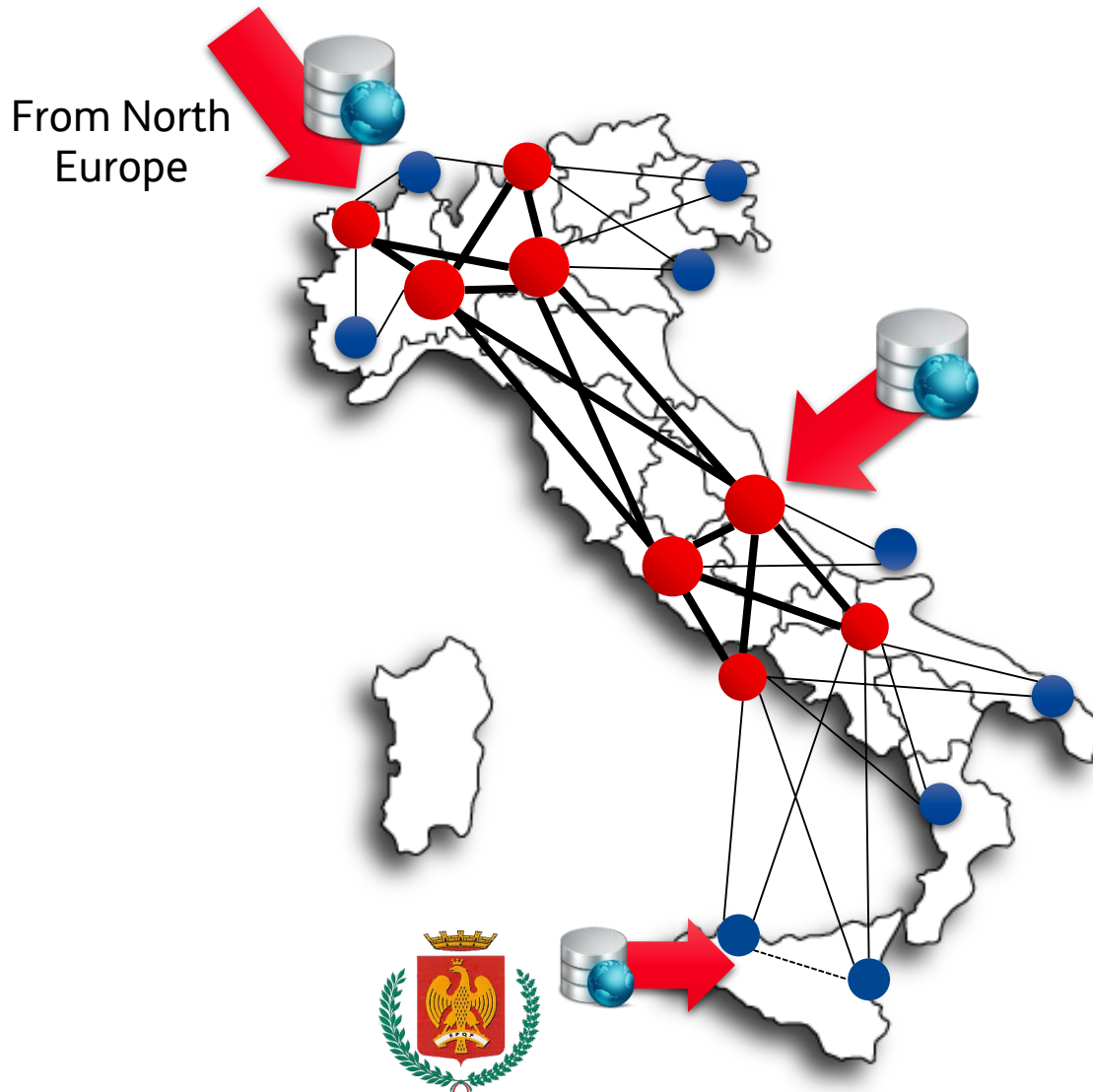


Stricter requirements of new services require better network performance



The amount of traffic generated by new services (and also Quality needed) requires deep dive analysis of an interconnection which serves Central and South Italy, starting from Rome

Architectural evolution and Interconnection opportunities (II)



The new Core IP NGCN network is symmetric and barycentric compared to RM and MI



Sicily is one of the regions most sensitive to network parameters for geographic reasons



Infrastructures already in Sicily could be used to optimize local traffic (to be technically studied)

Key Take-aways ...

- **Customers want to have access to new digital services**, seamless experience from all channels of fruition, personalization, self service, ... And they want it now
- **TIM's goal is to guarantee always the best experience in new services accesses**: the spread of fixed and mobile ultra broadband is a necessary precondition
- **The transformation of the networks made possible by SDN and NFV** will enable greater levels of automation by laying the foundations for a widespread operational efficiency and a higher agility in the business
- **Ultra BB and digital services spread** makes more relevant in e2e logic the role of core and transport network platforms
- **The architecture of IP and optical transport network and how to access contents**, will represent differentiating elements from customer prospective. It is necessary to deepen the analysis of peering solutions that will enhance the QoE