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Network 2030

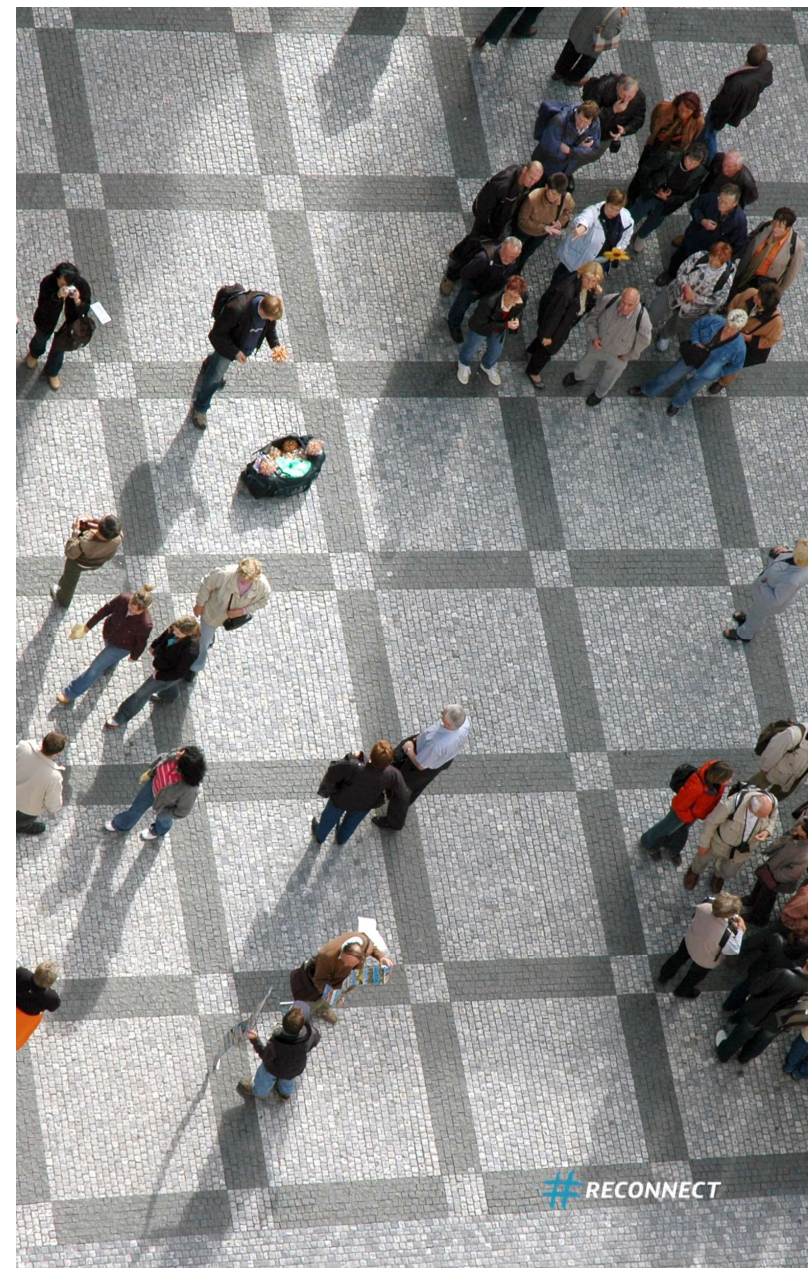## Implications of the new technologies for an operator

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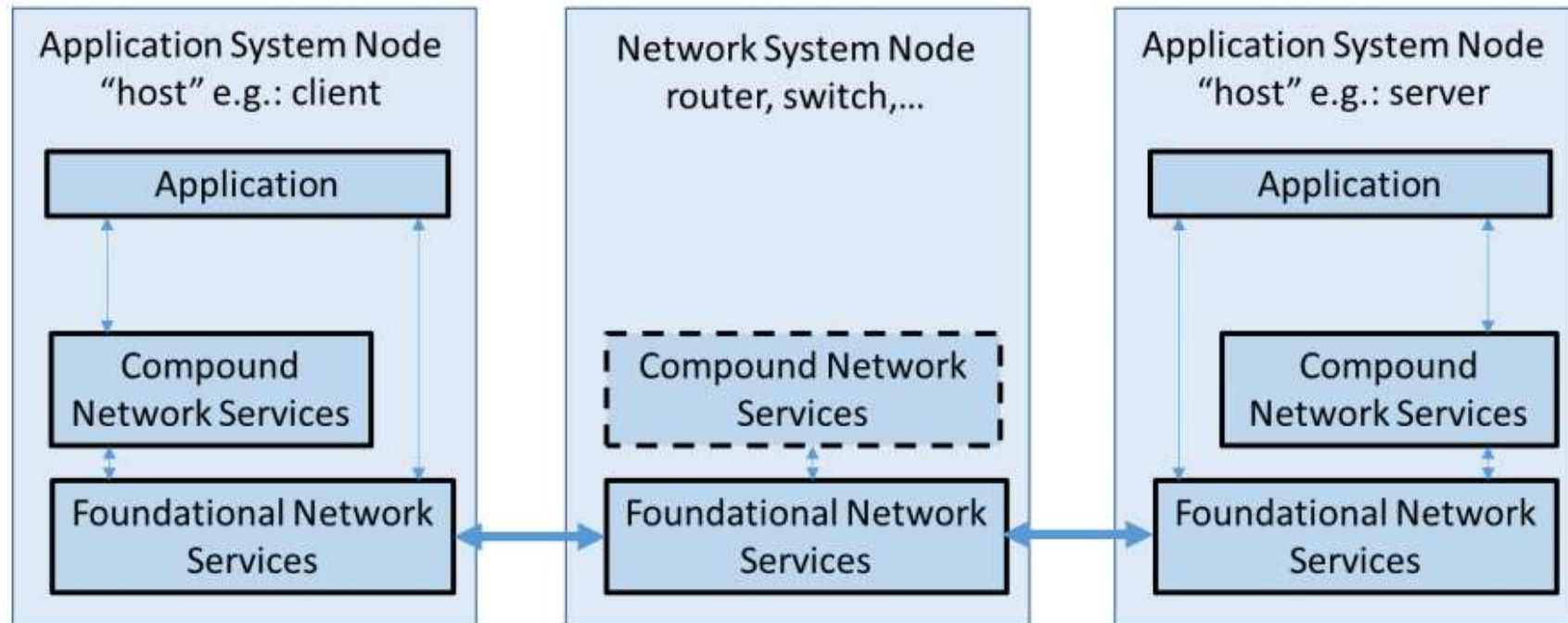
Lisbon, Portugal
13.01.2020

ITU **Sixth ITU Workshop on Network 2030**

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Starting point
# Foundational and Compound Network Services

New network-layer services on the data plane: High-Precision Communications (in-time, on-time), Qualitative communications, coordinated communications, etc.
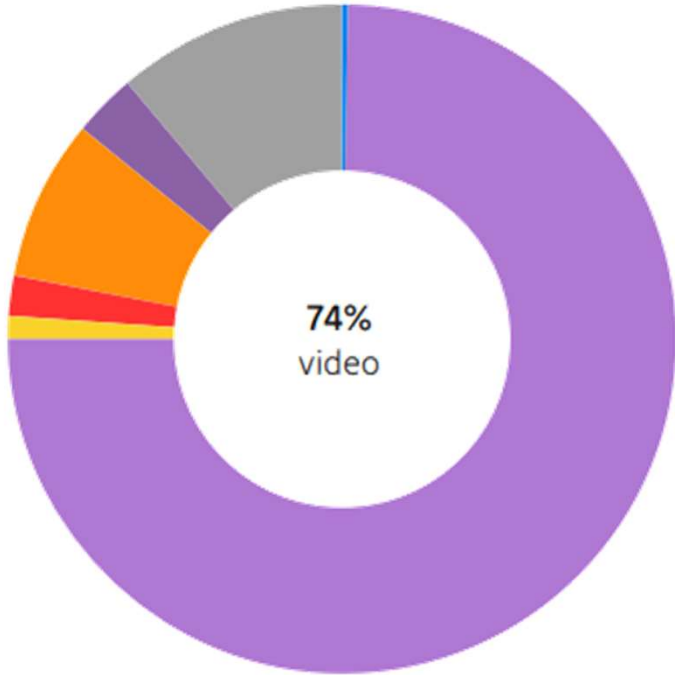
Mobile data traffic by application category per month (percent)

Legend: Video · Audio · Web browsing · Social networking · Software download and update · Other segments · P2P file sharing

Similar trend is observed nowadays in (fixed and mobile) networks
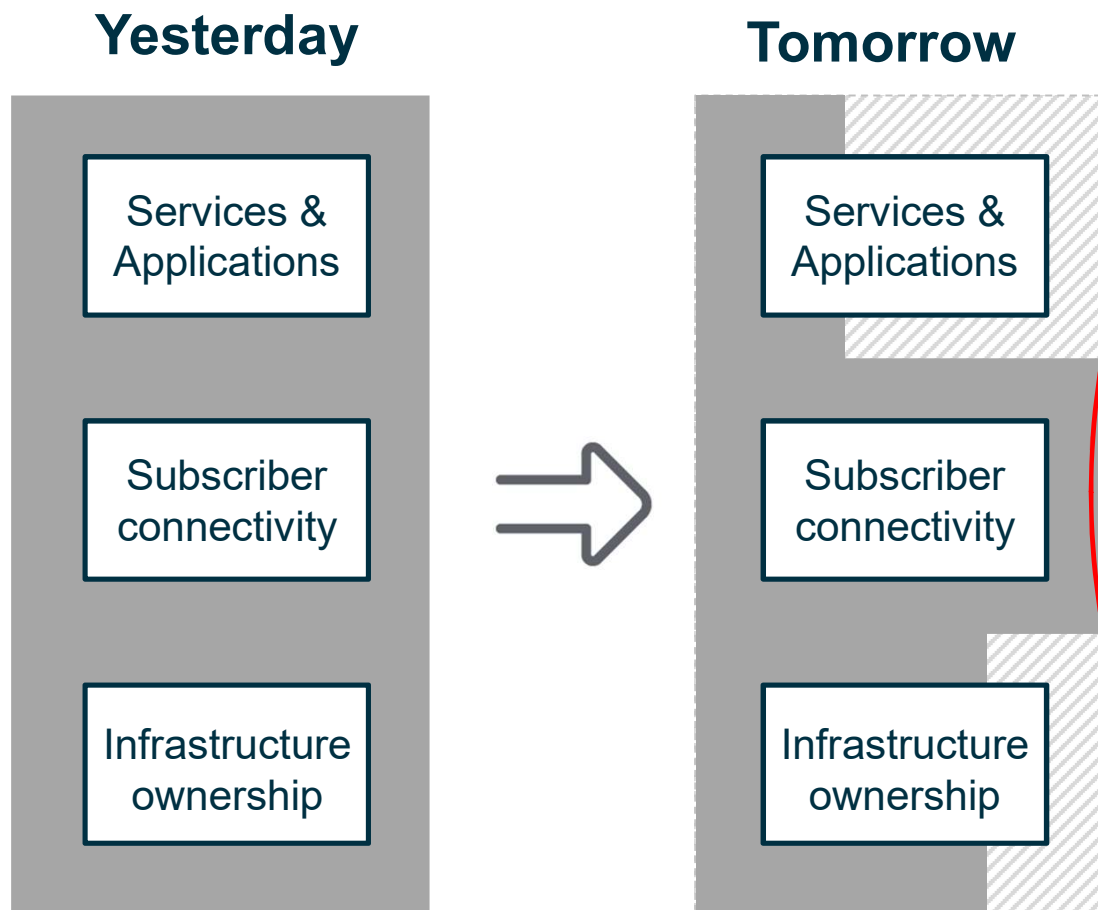
60% video
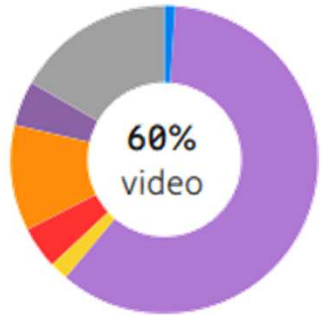
2018
28EB
per month

74% video

2024
131EB
per month

Main drivers for video traffic growth
— Video part of most online content (news, ads, social media, etc.)
— Growth of VoD services
— Video streaming services
— Changing user behavior — video being consumed anywhere, any time
— Increased segment penetration, not just early adopters
— Evolving devices with larger screens and higher resolutions
— Increased network performance through evolved 4G deployments
— Emerging immersive media formats and applications (HD/UHD, 360-degree video, AR, VR)

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3

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Source: Ericsson Mobility Report, June 2019.

Evolution towards Network 2030

Yesterday

Services & Applications

Subscriber connectivity

Infrastructure ownership

Tomorrow

Services & Applications

Subscriber connectivity

Infrastructure ownership

- Network 2030 services will be **richer** and **more immersive** and **interactive** than the ones existing today.

- This evolution means that both Services & Applications and Infrastructure are **not** completely **under control** of the Network operator.

- Integrating and controlling both for satisfying the requirements of Network 2030 services has **several implications** (see next slides)

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Network operator footprint

4

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Infrastructure ownership

- **ManyNets:** different levels of interaction with multiple infrastructures at international, regional, national and local levels (~ *fractal* scenario). Several schemas with different governance and operational models, such as sharing, alliance, full federation, etc.

- **Capillarity:** need to complement the coverage either temporary or permanently.

- **Abstraction:** normalized mechanisms for acting on heterogeneous resources and devices.

- **Information exposure:** way of interchanging information of resources, capabilities or even services (e.g., by means of catalogues and APIs).

- **Private Networks:** vertical industries deploying and operating their own infrastructures but requiring additional external services.

- **Disaggregation:** separation of SW and HW at all levels.

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Services and applications

- **Applications and Network integration:** both cannot longer exist without a tight coordination; collaboration mechanisms have to be developed.

- **Introduction of new protocols:** new protocols will require to evolve existing equipment for supporting advance functionalities just after a cycle of investment for supporting 5G services.

- **Orchestration and programmability:** tailored treatment of resources () and flexible placement of service functions.

- **Service segregation:** extension of the idea of slicing for segregating services from distinct applications, incorporating mechanisms in new protocols.

- **Planning:** smart planning and adaptation (in-operation network planning).

- **Testing:** need for experimenting services and applications on different execution environments, usually involving multiple actors and Network conditions.
  - Example in next slide and NET-I-120 contribution

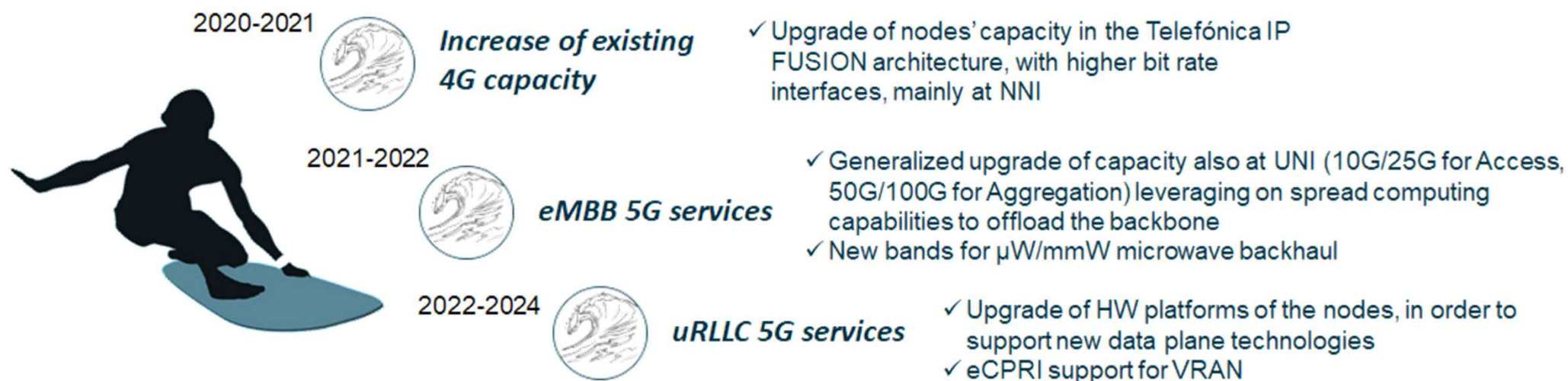# Interworking of multi-site experimental infrastructures (e.g., 5G-EVE)
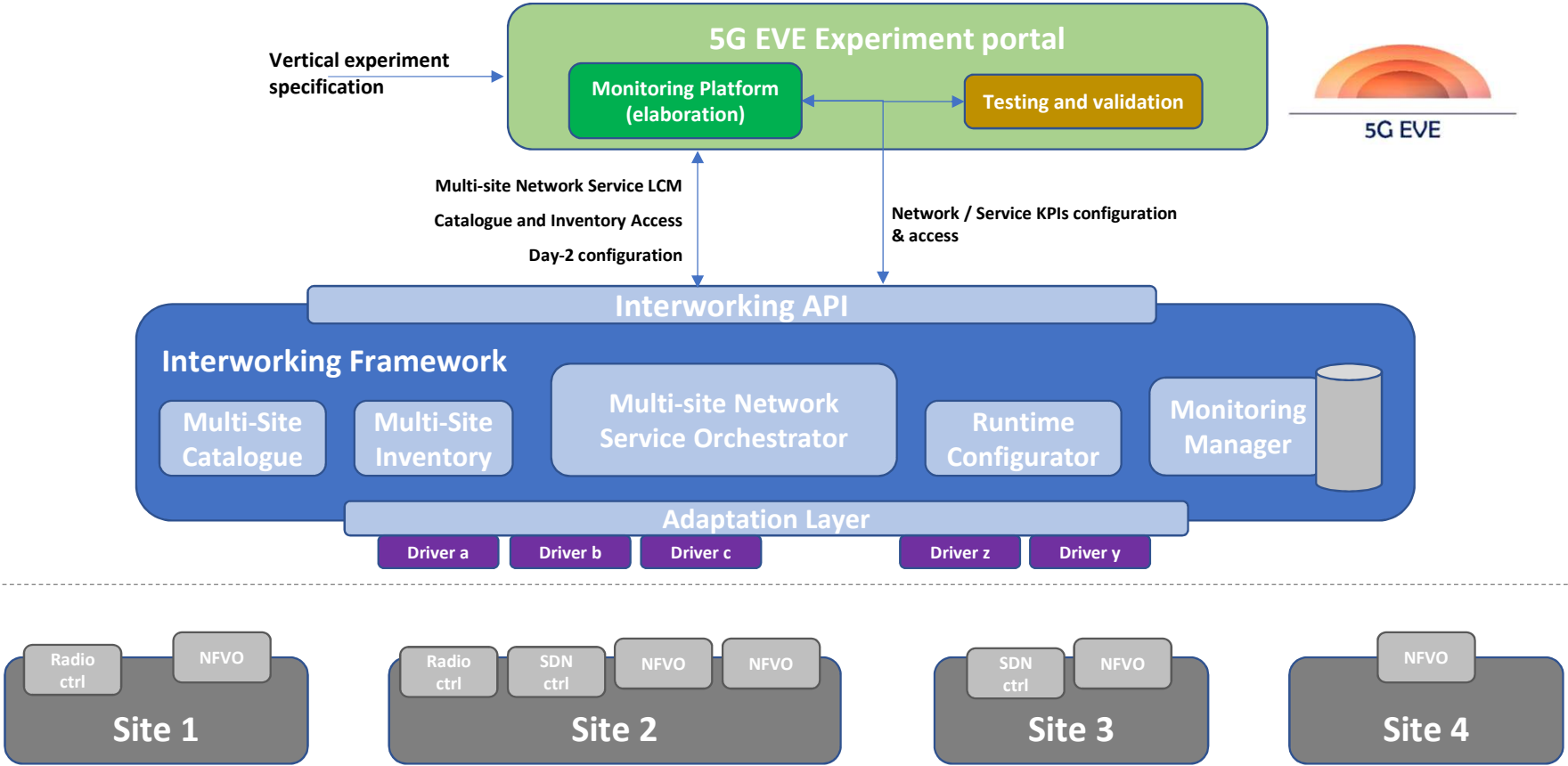
Transversal

- **Security:** heterogeneous environments require trustworthy operation.
- **Accounting:** different time scales in the usage of resources and functions as well as novel billing strategies (pay-as-x).
- **Monitoring and visibility:** essential for feeding decision systems and assessing the compliance of negotiated SLAs for Network 2030 services with so much stringent requirements.
- **Resiliency and availability:** trade-offs in terms of service characteristics and network infrastructure for satisfying targeted objectives for both requirements.

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What is the forthcoming investment cycle

- Multi-annual investment plans, typically for 3 – 5 years, for network simplification and rationalization

2020-2021 — *Increase of existing 4G capacity*

✓ Upgrade of nodes' capacity in the Telefónica IP FUSION architecture, with higher bit rate interfaces, mainly at NNI

2021-2022 — *eMBB 5G services*

✓ Generalized upgrade of capacity also at UNI (10G/25G for Access, 50G/100G for Aggregation) leveraging on spread computing capabilities to offload the backbone
✓ New bands for µW/mmW microwave backhaul

2022-2024 — *uRLLC 5G services*

✓ Upgrade of HW platforms of the nodes, in order to support new data plane technologies
✓ eCPRI support for VRAN

- Network 2030 will probably force (again) the change of HW platforms, together with the need of consolidating standard abstraction models
- Pre-2030 solutions could start being incorporated in the second cycles from now, according to market development

Economic context

Western European Telecommunications market 2018-2023

Legend: Fixed Data, Fixed Voice, Mobile Data, Mobile Voice, ARPU

Source: IDC
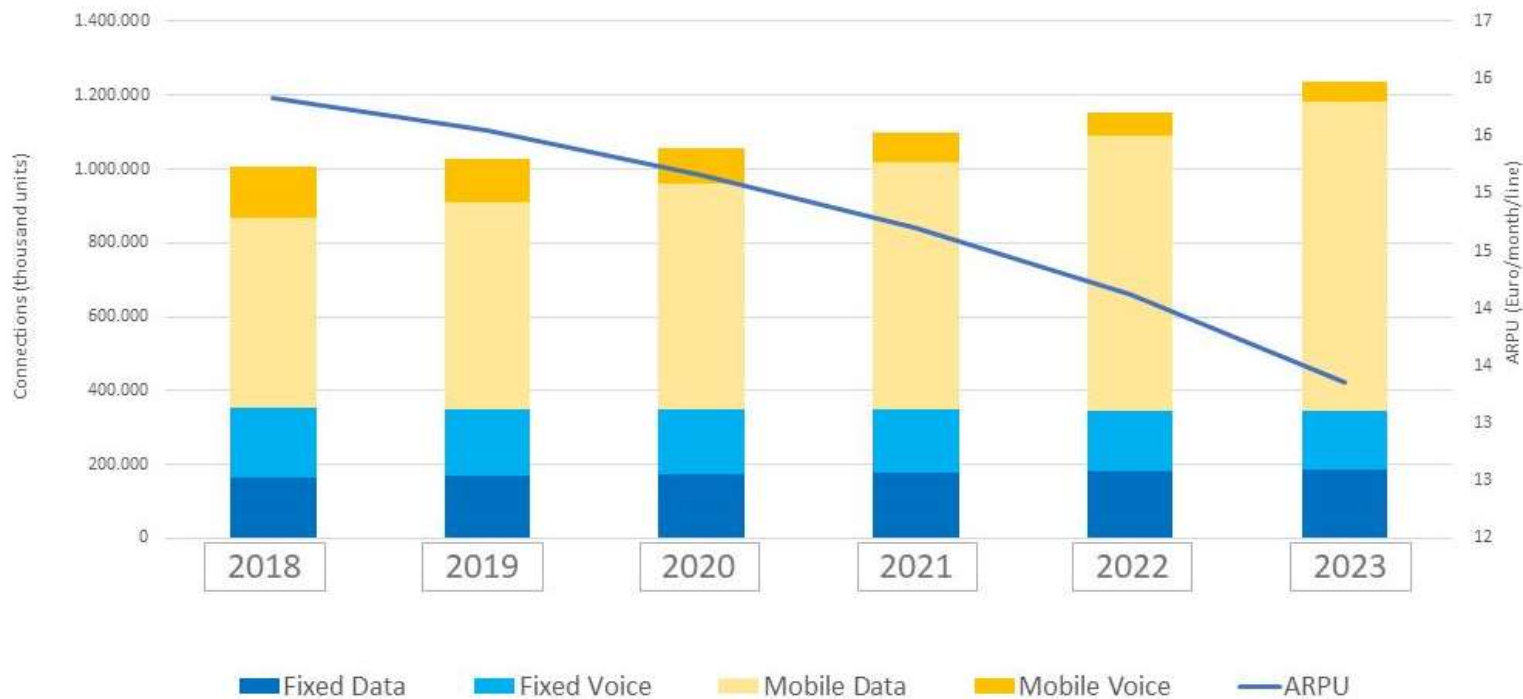
- From 2018 to 2023 the **ARPU** will **decrease** at a **rate of 3%,** despite the growth of the number of connections.
- The evolution of the **ecosystem** is becoming complex, **constantly changing** and with **new actors** appearing.
- New **monetization** schemas should be defined in order to make the situation sustainable, **otherwise investments** can **slow down** and delay the evolution of the Networks in the pace to Network 2030.

Conclusions

- The trend in the new telecommunications ecosystems is the interaction and integration with third parties for services, applications and infrastructures

  – Several technical implications can be identified in advance that should be solved for making Network 2030 services to have success

- Network 2030 services will imply (most probably) the evolution of the Network operator assets.

  – Investment cycles will be stressed by the need of renewing the Networks to support 5G in an scenario of decreasing ARPU

- Technical advances should come accompanied by new schemas for sustainability

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