

5G NETWORK SLICING

Scenarios for operational situations, 16.04.2024
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We belong to one of the largest telecommunications companies in the world: Telefónica S.A.

 **345 million**

Customers worldwide

 **41 billion**

Euro turnover in 2023

 **113.000**

Employees worldwide

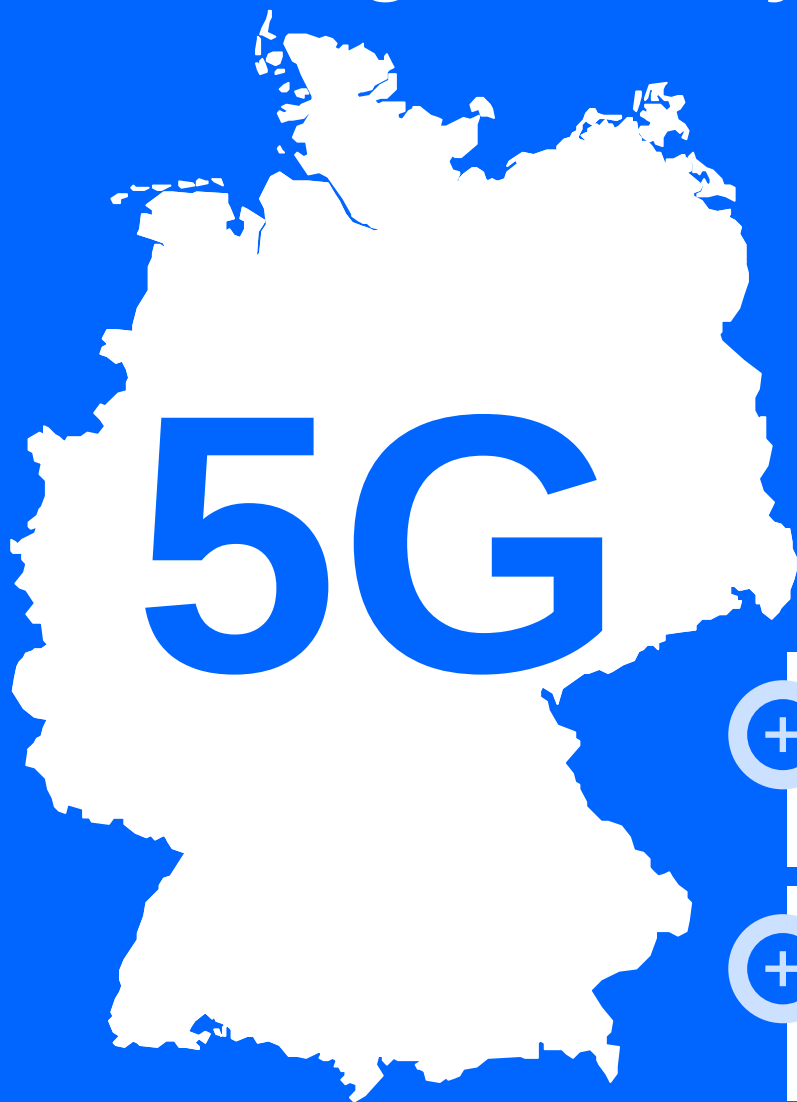


One of the **10** largest telecommunications companies of the world



Business activities in **12** countries

5G is significantly better performing than 4G/LTE



perspective downloads
with up to

20 GBit/s



up to
100x
faster than 4G



up to
1 million
devices/km² connectable



up to
90 %
higher power efficiency



Latency times of only
1 millisecond

Network slicing is the technology building block of 5G for providing a customized network



Virtual private network with secure end-to-end communication and data services



Automated and locally limited **on-demand provision** possible



Utilization of **existing physical infrastructure** in the public network



Slices configurable for **individual use case requirements**



Separate network instances with **guaranteed resources**

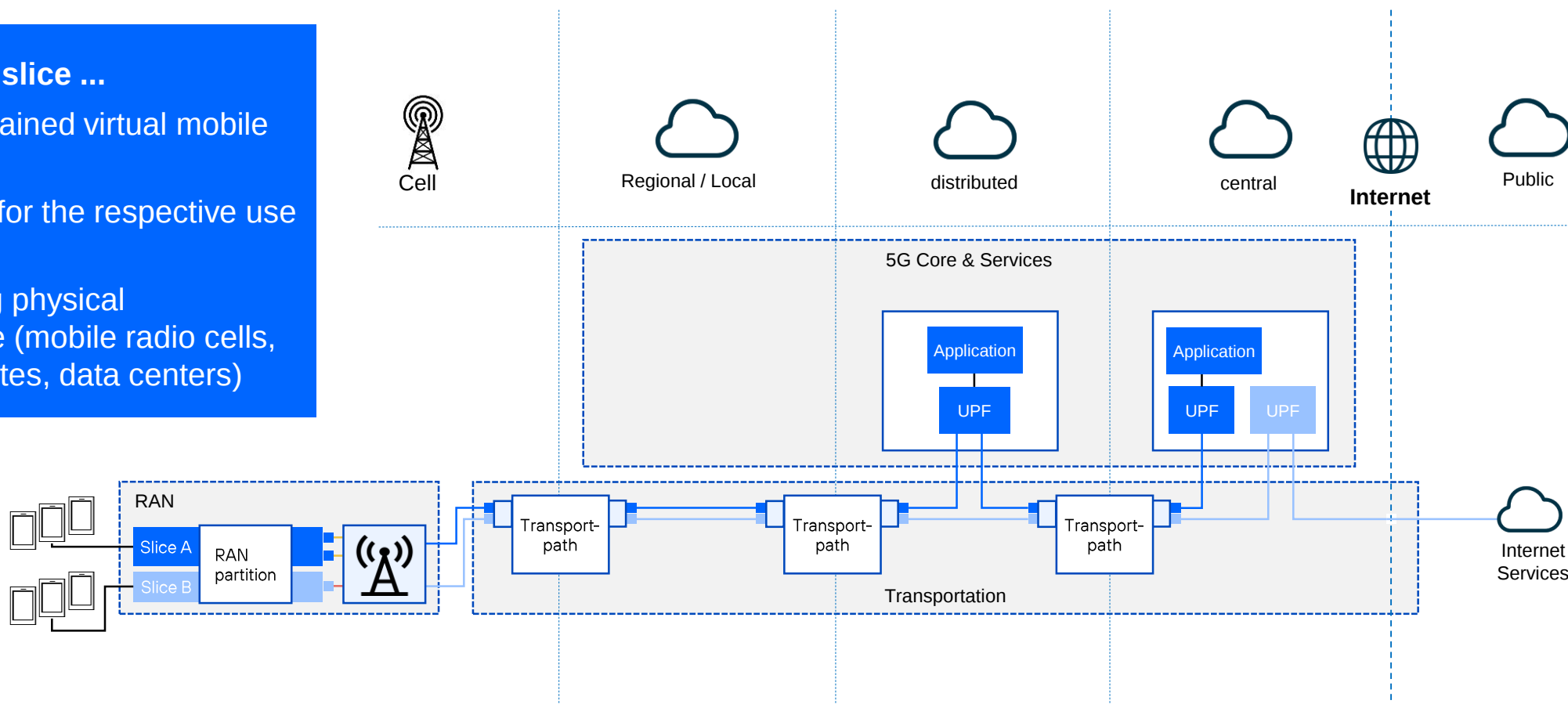


Multi-access edge computing for use cases with very low latency requirements

5G network slicing enables virtual private 5G networks based on the Telefónica infrastructure

A 5G network slice ...

- is a self-contained virtual mobile network
- is optimized for the respective use case
- uses existing physical infrastructure (mobile radio cells, transport routes, data centers)



Example 1: *Mission critical communications* containing multimedia content in rural areas



Image source: Wikipedia

- Extremadura, Spain
- one of 17 autonomous communities
- 42,000 km² (~ Netherlands, Switzerland)
- 1 million inhabitants = 25 inhabitants/km²
- 57% of the population in municipalities with <10,000 inhabitants

5G Network Slice from Telefónica S.A.:

- **10% of 5G network capacity** reserved for police / emergency services
- in the **700 MHz band** (long range around each cell)
- Enables **~150 parallel PTT¹⁾ voice calls (HD)** with good network coverage, ~60 with normal network coverage
- enables **video transmission (SD / HD)**

¹⁾ PTT: Push to talk

Example 2: *Video transmission of the overall situation at busy locations*



Image source: Telefónica S.A.

5G Network Slice from Telefónica S.A.:

- **3 venues:** Bernabéu Stadium, Cívitas Metropolitano, WiZink Center (Madrid)
- **30% of 5G network capacity** reserved
- in the **3.5 GHz band** (high bandwidth for video transmission)
- Enables **80 Mbit/s video transmission** (1x 20 Mbit/s drone feed + 8x 7.5 Mbit/s by emergency services)
- Use: Transmission of **drone video streams** of the overall situation to the control center and emergency services on site



Outlook: 5G network slicing on demand

State of the art:

- **Technology available**
(network technology, end devices for BOS)
- **Proven practical benefits** and applicability for BOS
- Setting up network slices requires **lead time**, so can only be used for planned operations (events, rallies, etc.)

Perspective:

- **Automation** of the network slice setup process
- **Provision "on demand"** - request via interface, mobile app, web portal
- Set up **within a very short timeframe**
- Expansion of usability for **emergency situations** (crime scenes / accident sites, disasters)

Target scenario: ad-hoc provision of 5G broadband communication for emergency situations

- **24/7 request** via mobile app / web portal
- **Broadband communication** for voice (PPT / telephony), image and video transmission (e.g. for drones)
- **Integration** of central control centers and decision-making bodies possible, e.g. for dedicated applications
- **Interfaces to public networks** (telephony, Internet) possible

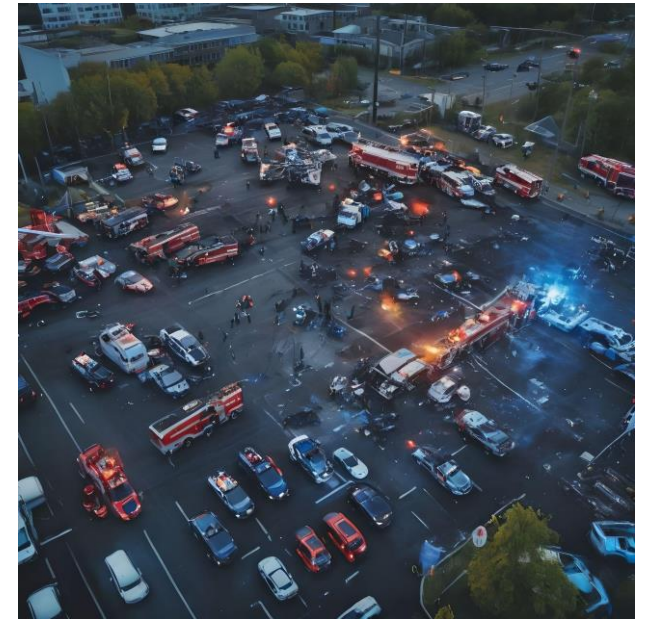
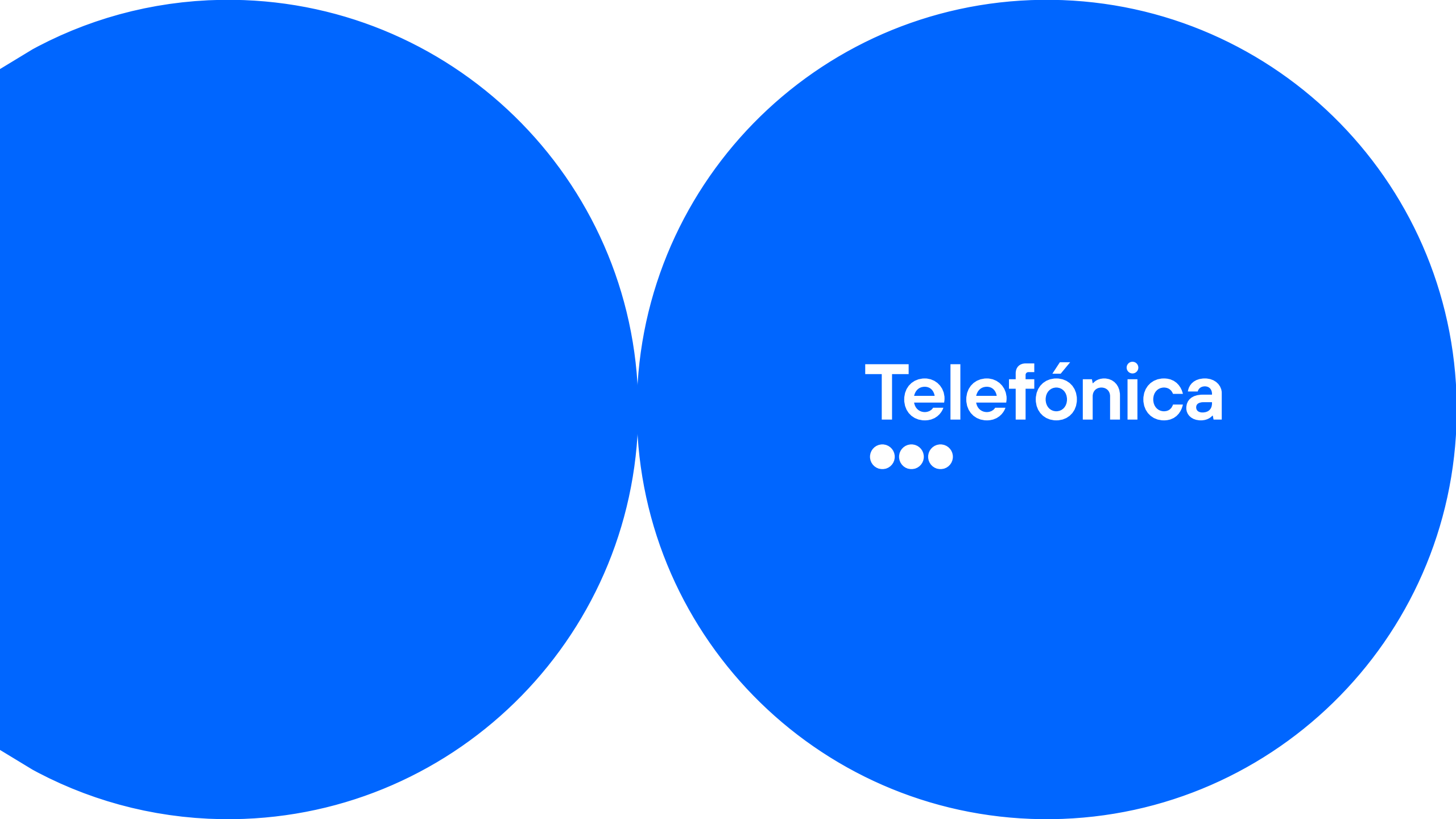


Image source: generative AI

The image features two large, solid blue circles that overlap in the center. The circle on the right contains the Telefónica logo in white. The logo consists of the word "Telefónica" in a sans-serif font, with three small white dots positioned directly below it.

Telefónica
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