



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

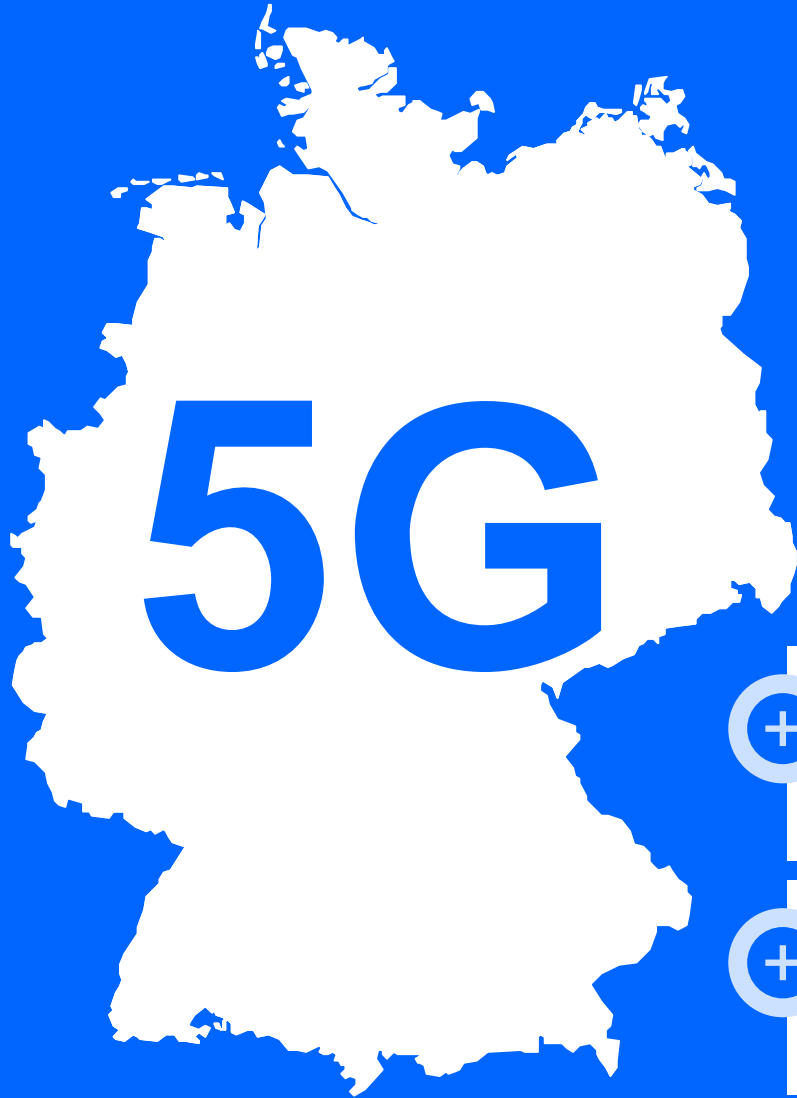


One of the **10** largest telecommunications companies of the world



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**

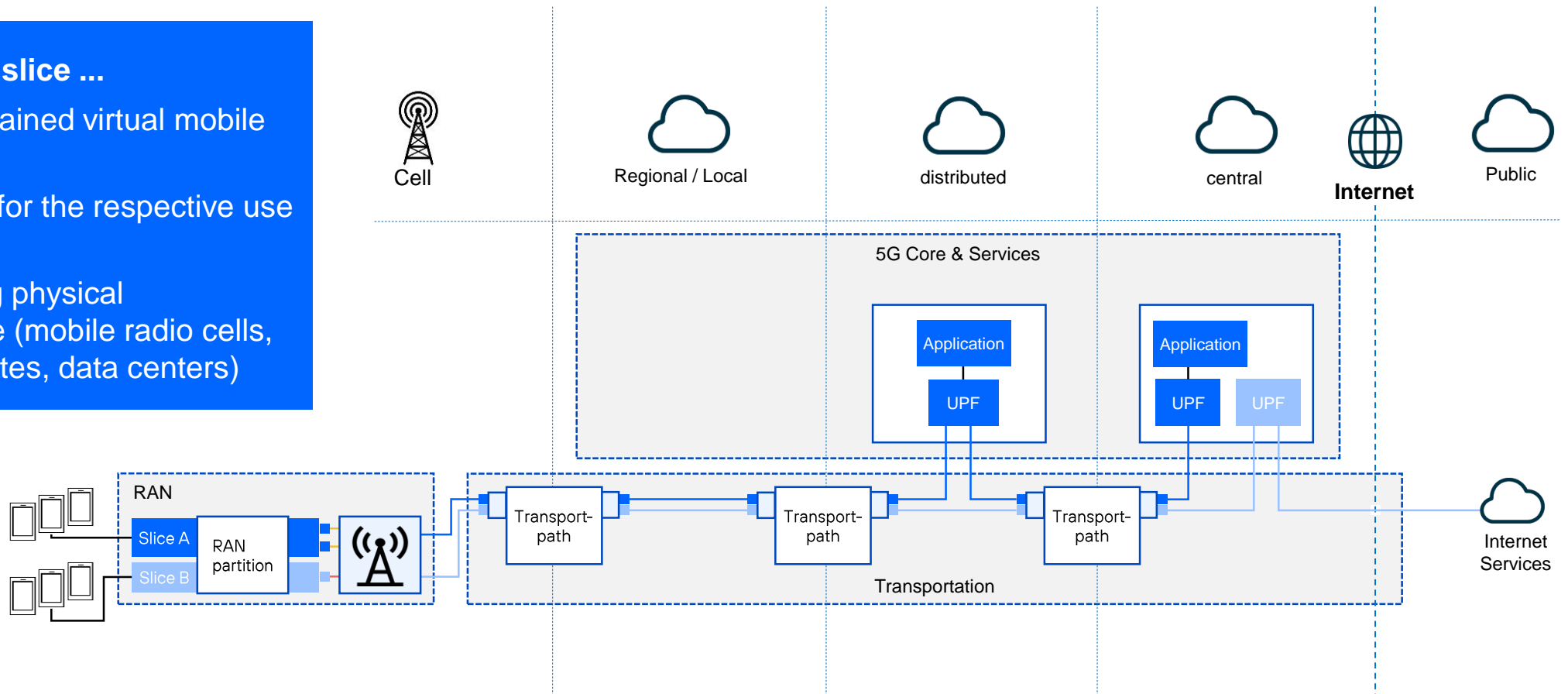


Multi-access edge computing for use cases with very low latency requirements

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

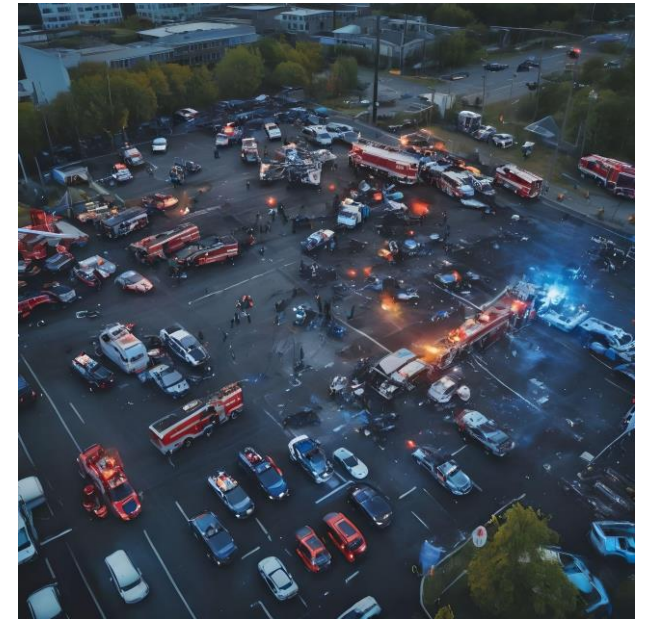


Image source: generative AI



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