
# Welcome

## The Architectures of private 5G Networks

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## 5G-Industrie Summit 2021



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The Architectures of private 5G Networks

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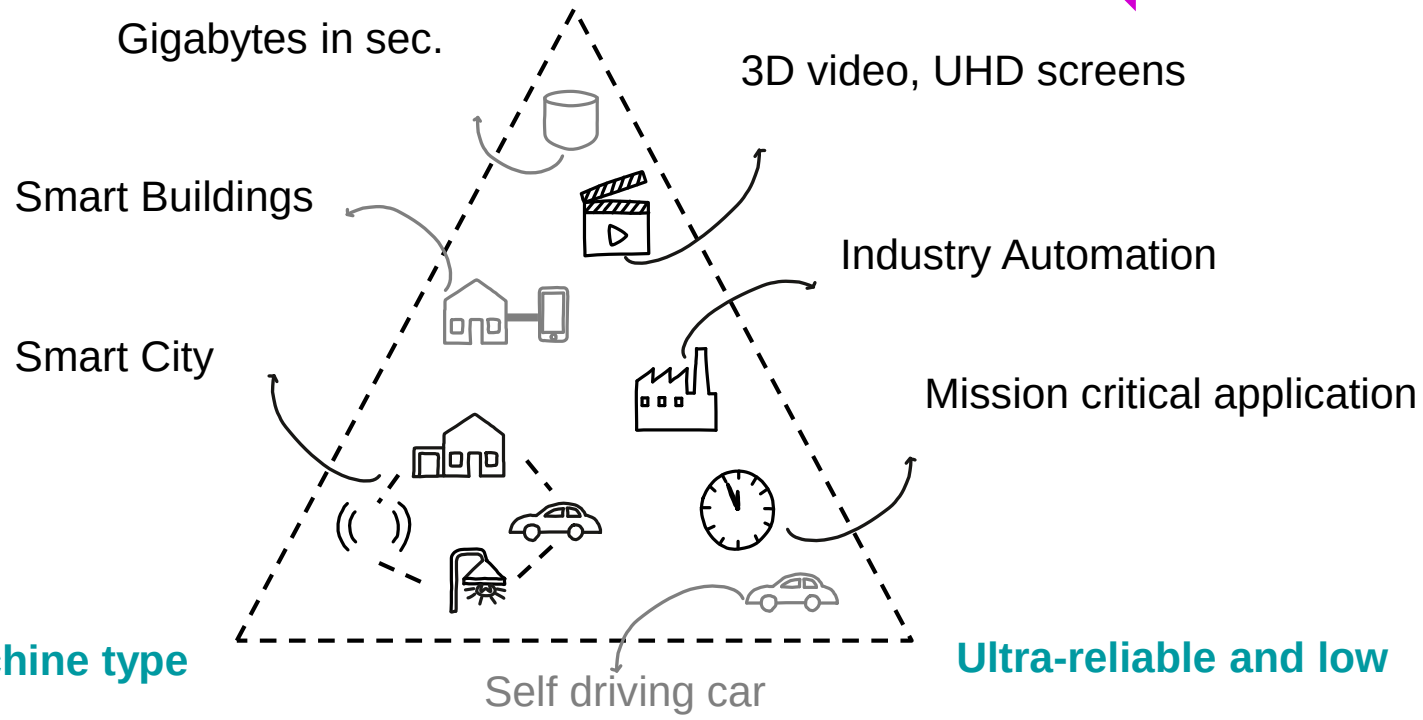
# 5G comes in steps

**Enhanced mobile broadband (Rel. 15)**

**Available Today**




**Massive machine type communication (Rel. 16)**

**Ultra-reliable and low latency communications (Rel. 16 + 17)**





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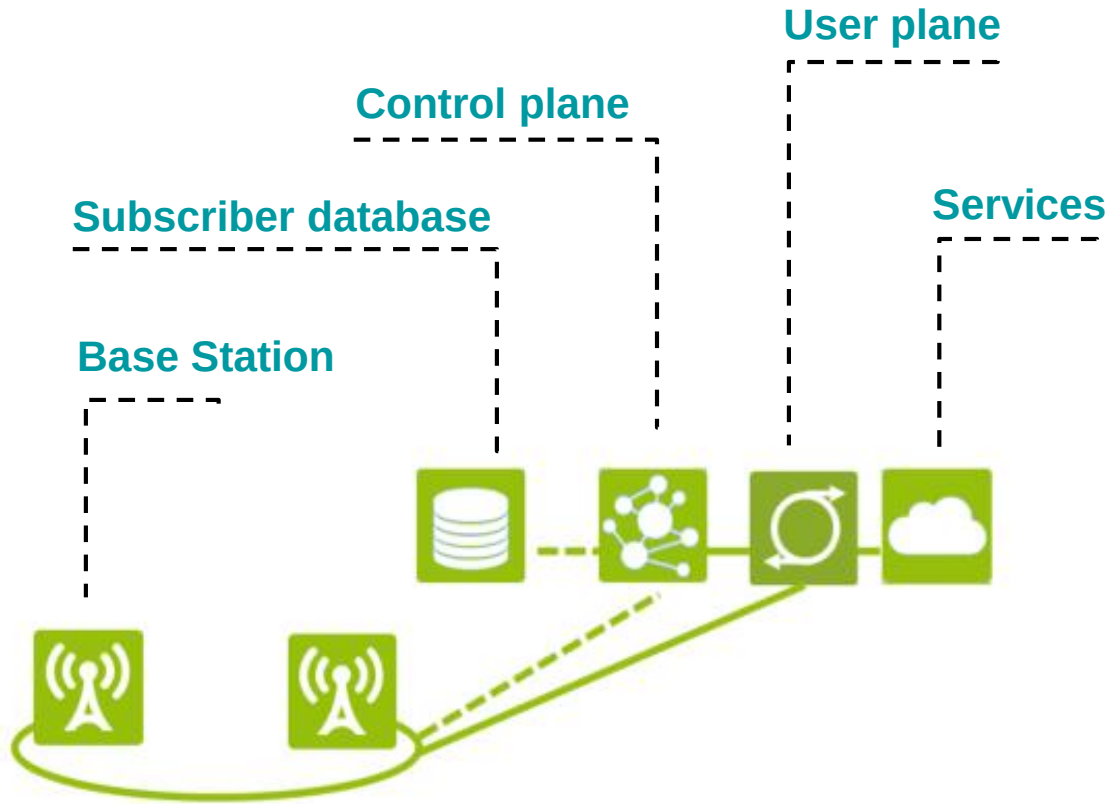
# Public 5G network






**Base station**: Where the radio network (RAN) begins

**Control plane**: Management of the devices

**Subscriber database**: Registration of the devices

**User plane**: Runs the data traffic

**Services**: E.g. voice, data, SMS, MMS, etc.

**NSA** = **n**on **s**tand **a**lone

5G

4G

**SA** = **s**tand **a**lone

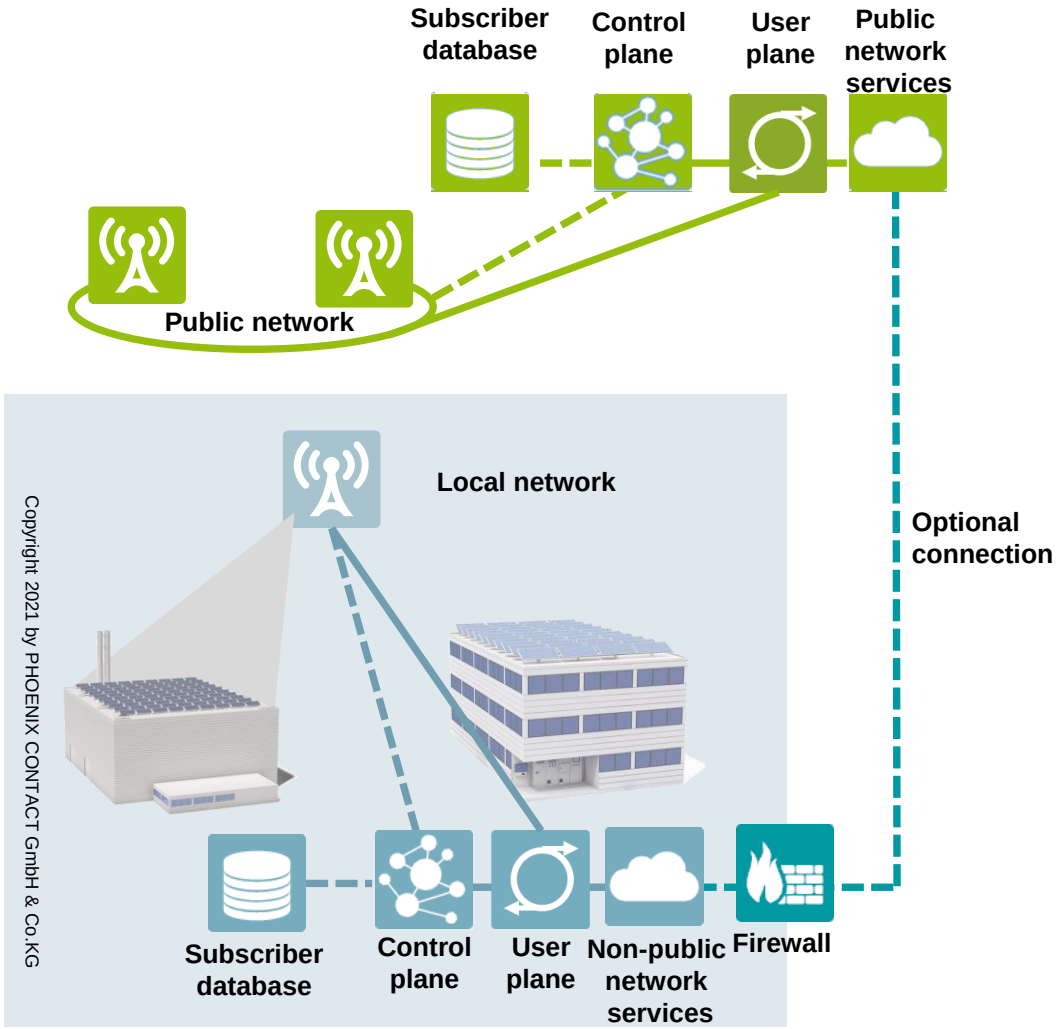
5G

**RAN** = **R**adio **A**ccess **N**etwork

**NPN** = **N**on **P**ublic **N**etwork

**PN** = **P**ublic **N**etwork

# Private 5G network, non-public-network (NPN), campus network



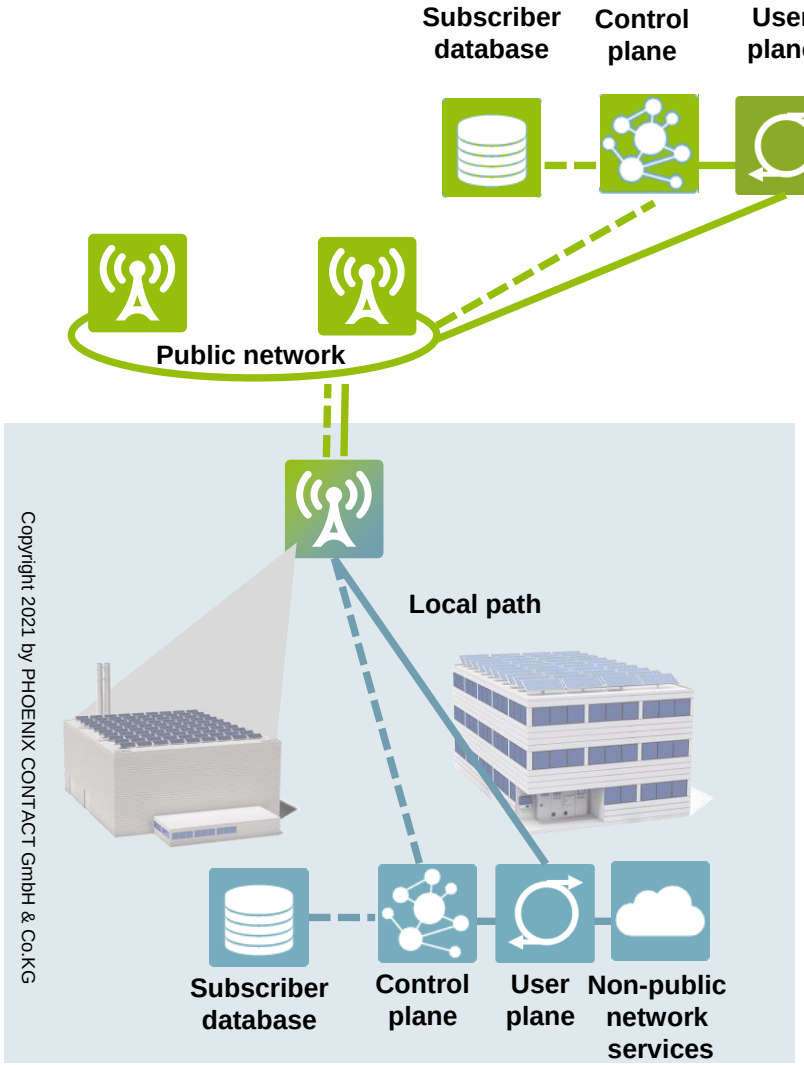

## Two physically isolated networks

- isolated deployment
- most likely diverged frequency bands (e.g. GER, UK, JP, …)
- different network ID‘s

## Pro‘s and Con‘s

- owner has full management control
- Physicaly Isolated network
- low latency possible
- High management effort

# More NPN‘s – Shared RAN



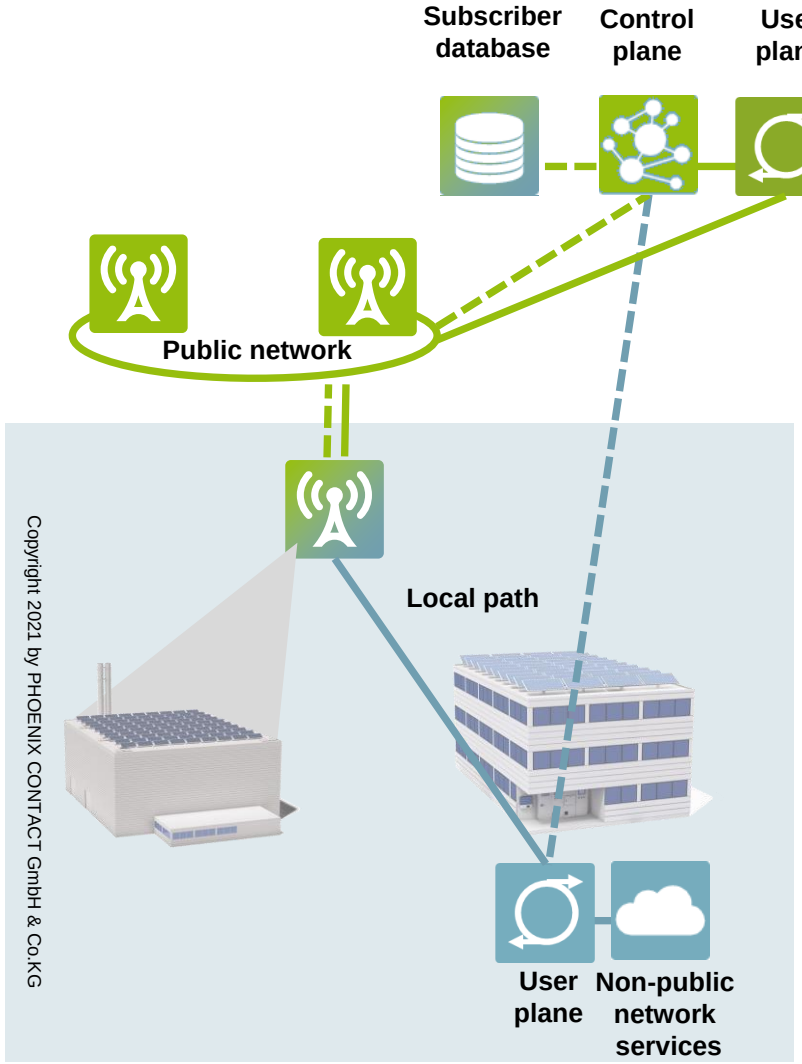

## Base station is part of both networks (private and public)

- Supports services, which are pure locally and services which are part of the public network (e.g. voice)

## Pro‘s and Con‘s

- full management control (except RAN sharing)
- Logical isolated network
- Public Network Services available
- High management effort

# More NPN‘s – Shared RAN and control plane






## Base station is mainly part of public network

- Physical communication into public network for control & management
- Connection of base station into company network for process data
- Virtual „private Network“ e.g. by means of network slicing

## Pro‘s and Con‘s

- Process data stays local
- Less device management effort
- Latency and Availability depends on public network service level agreement
- No physical isolation from the public network

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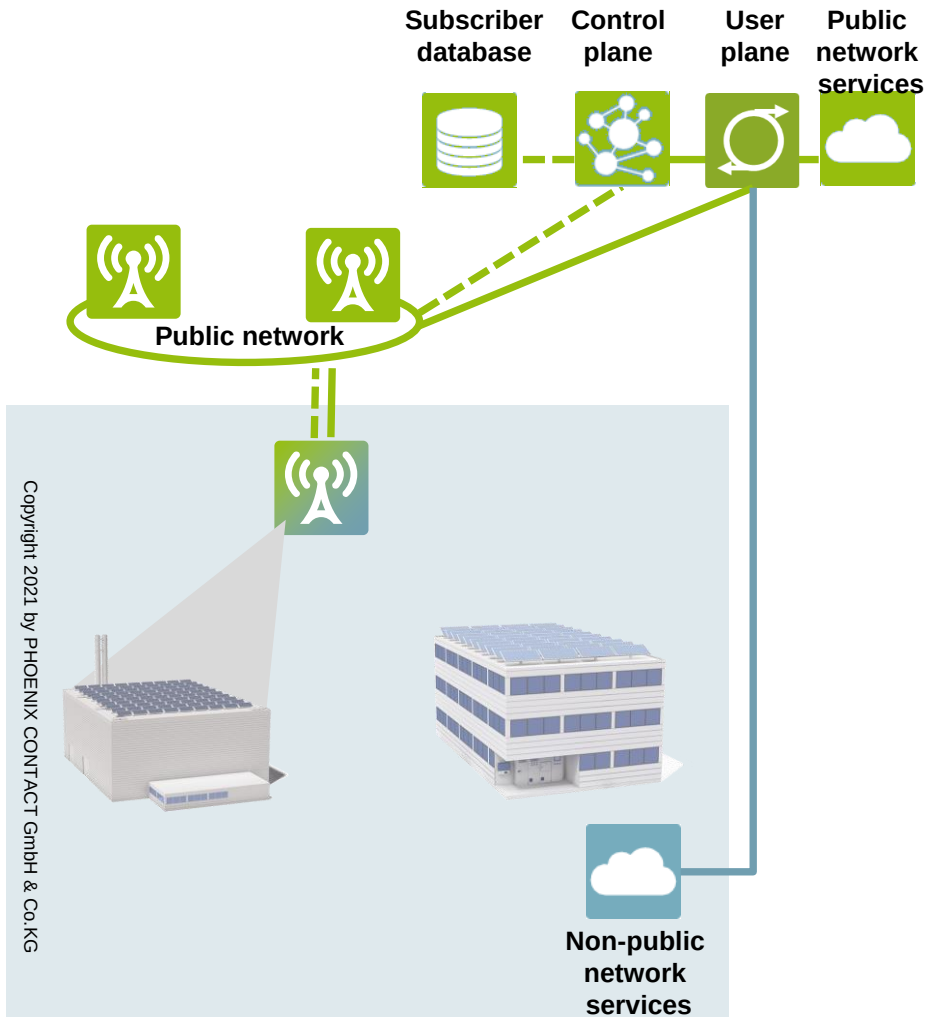
# NPN deployed in public network




## Base station is totally integrated into public network

- Physical communication into public network
- Not only control but also process data runs through public network
- Virtual „private Network sources“ e.g. by means of network slicing

## Pro‘s and Con‘s

- No device management effort
- Private services available via public network
- Latency and Availability depends on public network service level agreement
- No physical isolation from the public network



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# Which architecture suits my needs?

- What latency do I need for my use cases 1ms, 10ms, or 100ms?
- Importance of Availability and Service Level Agreement?
- Do I need public network functions?
- Is my IT-department able to manage / maintain a full private network?
- How important is independency from network providers?
- What is possible in my country?
- How much investment / running cost am I willing to spend?


# Thank you

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