



5G Technology

The next generation of mobile networks

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Agenda

- 01** Overview
- 02** Core concepts
- 03** Applications
- 04** Challenges
- 05** Future



Image



OVERVIEW

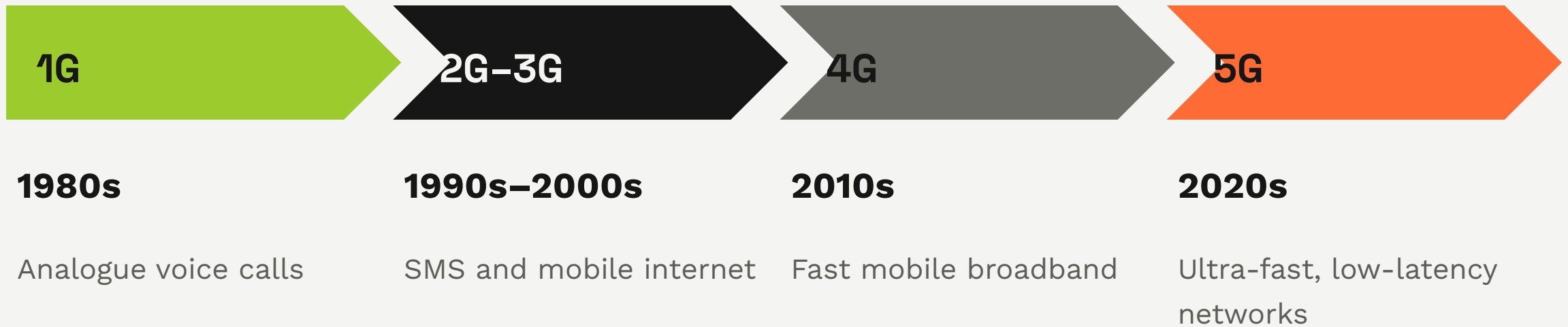
04

Introduction

- 5G is the fifth generation of cellular networks
- It offers far higher speeds and lower latency
- It connects many more devices per square kilometre
- It enables new services from smart factories to remote surgery



Evolution





CORE CONCEPTS

02

Key concepts

01

mmWave

High-frequency bands with huge capacity but short range.

02

Massive MIMO

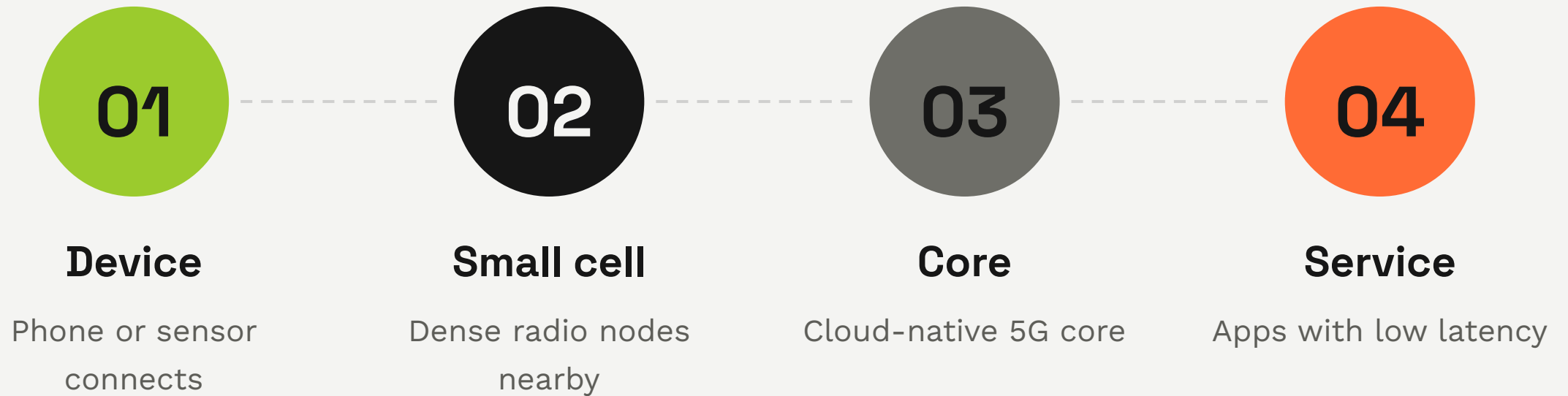
Many antennas serve many users at once.

03

Network slicing

Virtual networks tailored for each service.

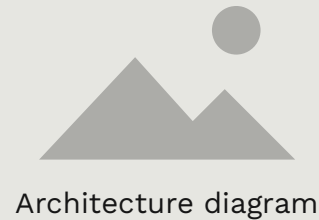
How it works



Architecture

A cloud-native core and dense small cells.

5G separates the radio from a software-defined core, so operators can create network slices with guaranteed speed and latency for different uses, from video to industrial control.



APPLICATIONS

03

Applications



Image 1

Smart factories

Wireless robots and sensors.



Image 2

Telemedicine

Remote consultations and monitoring.

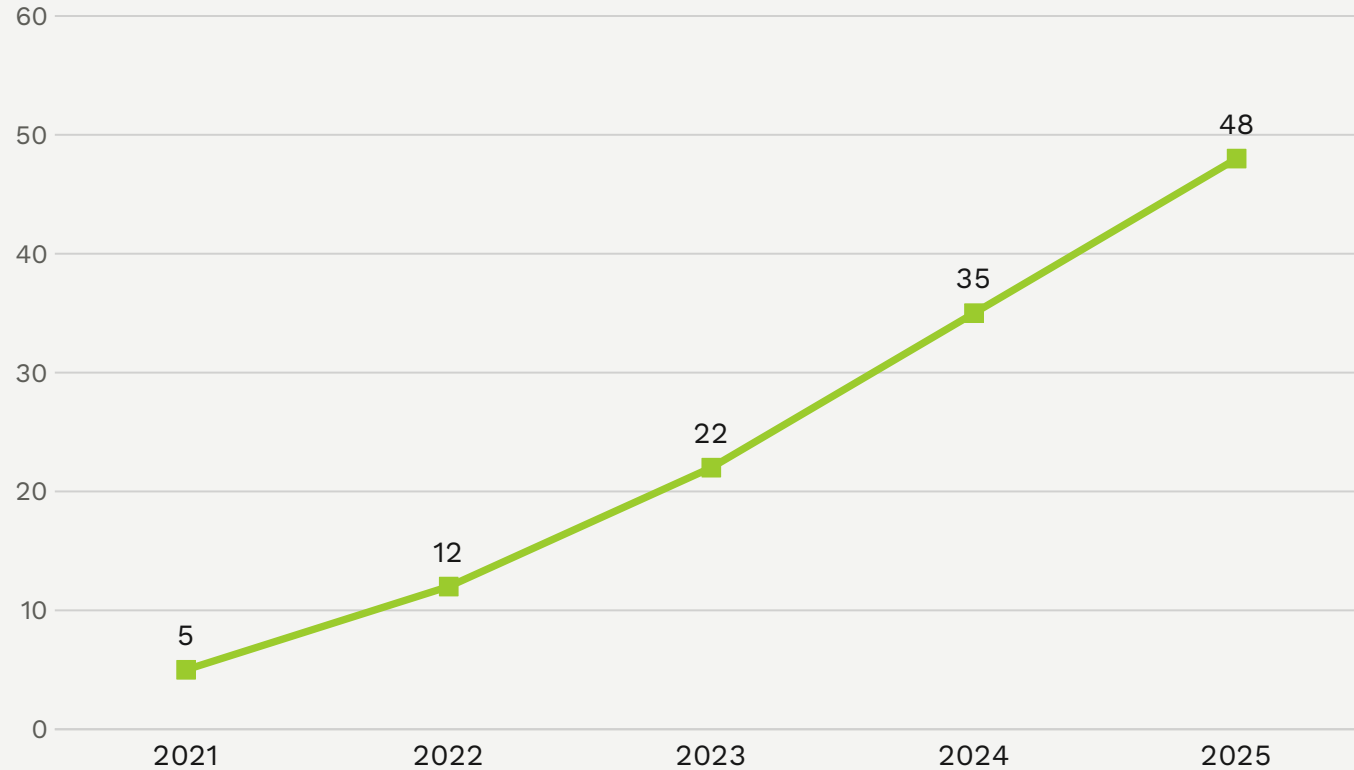


Image 3

Connected vehicles

Real-time traffic data.

Adoption trend



Share of mobile connections
on 5G (sample data).

Sample data for illustration — replace with your own figures.

Advantages and limitations

Advantages

- Very high speeds
- Latency of a few milliseconds
- Huge device capacity
- Flexible network slices

vs

Limitations

- Expensive rollout
- Short range at high bands
- Device costs
- Energy use of dense networks

Open challenges

01

Coverage

Dense cells needed in cities.

02

Cost

Spectrum and equipment investment.

03

Security

More connected devices to protect.

FUTURE

04



**5G-Advanced and 6G
research are already
under way.**

Looking ahead

Conclusion

- 5G is more than faster phones
- It unlocks industrial and civic use cases
- Coverage and cost remain the key challenges

References

- [1] Survey paper on the topic, IEEE Access, 2024.
- [2] Textbook chapter covering fundamentals, 2023.
- [3] Recent conference paper on applications, 2025.
- [4] Industry white paper (generic reference).

Questions?

Thank you for listening.