

5G LAB: ACCELERATE YOUR DIGITAL TRANSFORMATION



Unleash the potential of 5G & Edge to face the needs of the Intelligent Industry

As the industrial world becomes more and more data-driven, companies face important decisions regarding whether the acceleration of connectivity, cloud computing, and private networks can best address and future-proof their fast-changing needs.

Companies need to engage these disruptive transformation paths by reflecting on various use case innovations, technology landscapes, and the business value generated. To support organizations in their 5G journey and in winning the innovation game, we at Capgemini help them strategize, build and monetize what 5G can bring to their business.

We harness this unique potential within our global network of 5G Labs. Here we tailor solutions to help our clients achieve their future business ambitions in a sustainable manner through 5G connectivity and related technologies. By leveraging our facilities together, we address the whole value chain in the Intelligent Industry with attention to both network technology innovation and industry-focused transformative solutions. We enable Network Equipment Providers (NEPs), Communication Services Providers (CSPs), enterprises, and industrial players to accelerate their deployment of next-generation services and solutions.

To help our clients face those new market needs, Capgemini complements our telco engineering portfolio with a strategic asset: the 5G Lab. This provides capabilities for prototyping, development, test and validation environments, innovative solutions and services for the new 5G ecosystems, supporting all steps of the client journey and accelerating time to market.

The new lab capabilities will enable CSPs to develop innovative solutions and services while also drawing on Capgemini's expertise in building frameworks and go-to-market accelerators for telcos, enterprises, and original equipment manufacturers (OEMs).



We at Capgemini help them strategize, build and monetize what 5G can bring to their business.

The lab features a dedicated private end-to-end 5G SA network including datacenter infrastructures, hardware, network components, software frameworks, service platforms, tools ecosystem, and client portals. These are all used to create flexible, scalable, multi-tenant and secure environments so that Capgemini can help its customers create solutions that can be developed, trialed and tested before rollout to ensure success.

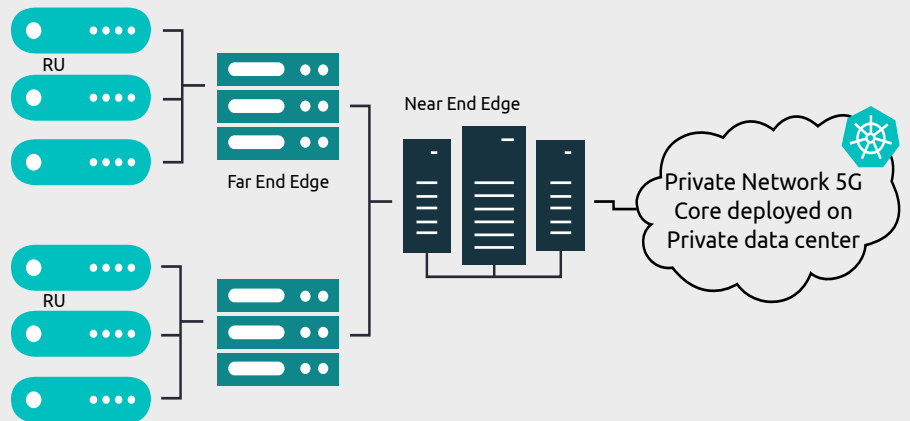
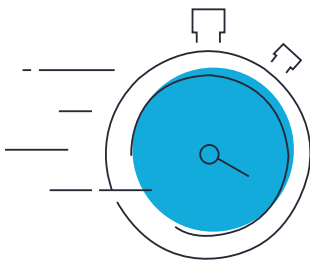


Figure 1: 5G SA Private Network Lab Implementation



The result is a rapid and cost-effective path to rolling out next-generation products and services

The Capgemini 5G Lab presents multiple benefits to support our clients and partners.

It enables us to demonstrate:

- How 5G can improve time-to-market for CSPs, OEMs and enterprises through ready to use, flexible development and testing environments
- Capgemini’s capabilities for enabling CSPs and NEPs to test interoperability in 5G ecosystems
- How Capgemini can serve as an innovation engine that provides early access to state of the lab infrastructure for testing end-to-end solutions
- Capgemini Software Frameworks (SFS) in different areas like 5G core, 5G RAN, RIC controller, AI/ML and Edge platform
- Platforms that simulate scenarios and showcase solutions for proofs of concept (PoC) and pilots

- 5G industry applications that provide dedicated environments for prototyping designs within a complete 5G ecosystem
- Capgemini’s testing and integration capabilities for enterprise solutions in an independent telco grade infrastructure
- How Capgemini can provide a customized environment for tests and trials for any user application, enabling CSPs to take advantage of Capgemini Engineering’s vertical market expertise, enterprise services, and enterprise applications

The result is a rapid and cost-effective path to rolling out next-generation products and services, and a major improvement in terms of cost profile for project and operational readiness.

5G Lab: to showcase our 5G end-to-end capabilities for enabling your secure digital transformation

5G Lab demonstrates Capgemini’s capabilities in the following areas:

- Capgemini Frameworks like 5G Core and Edge platform (ENSCONCE/E²CO)
- Development of 5G use cases/ applications with distributed deployments
- Orchestration for cloud infrastructure
- Systems integration
- Interoperability and device testing
- Telco cloud infrastructure, CNF, and VNF-based deployments

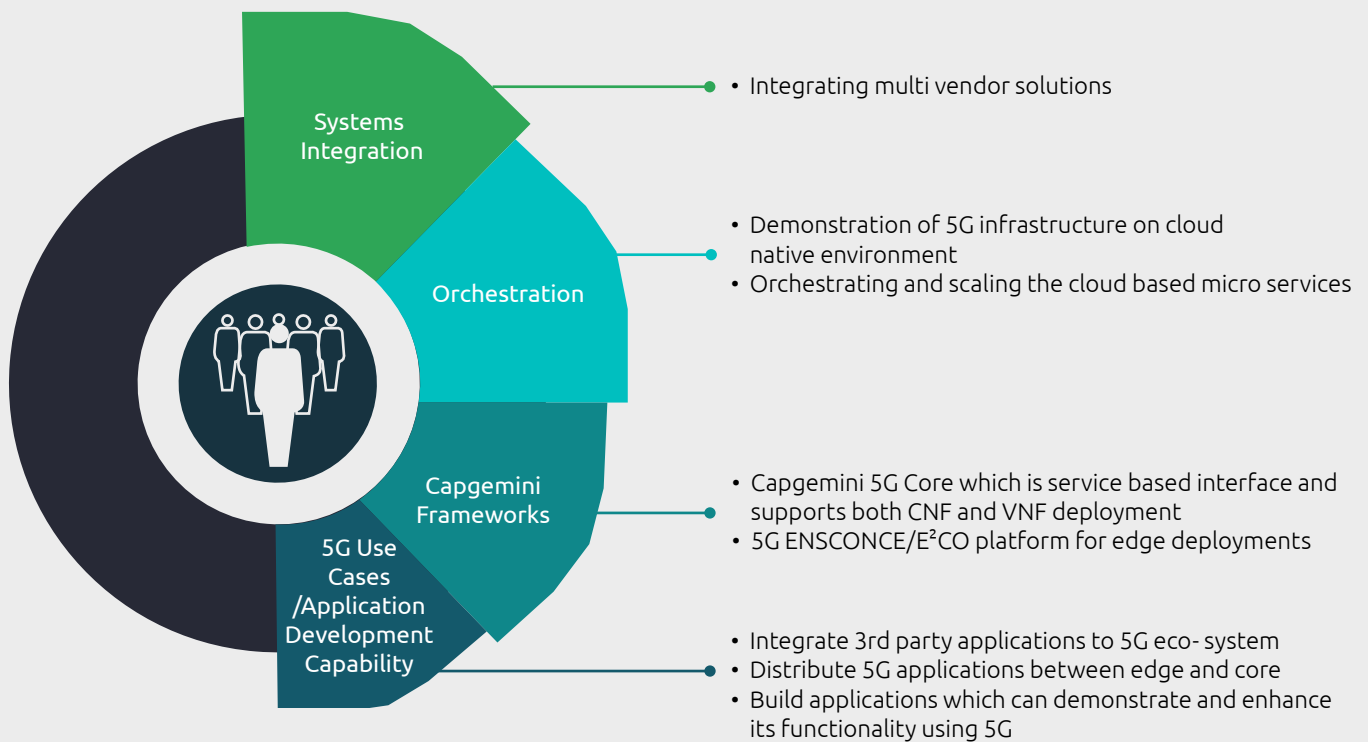
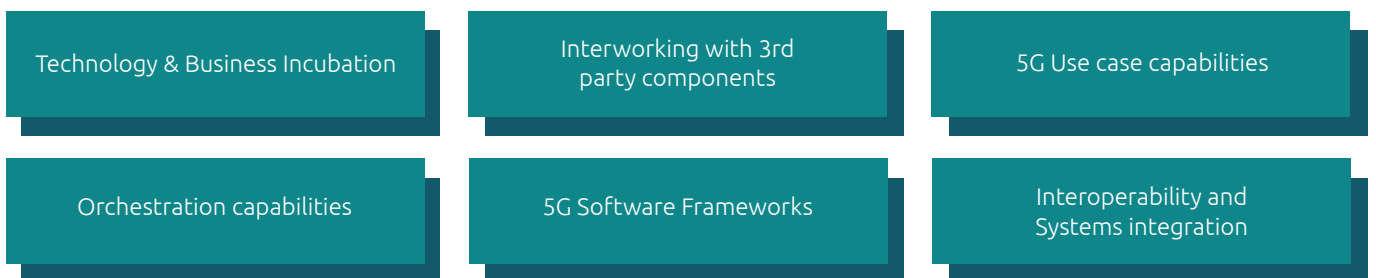


Figure 2: Lab Target Offering - Overview

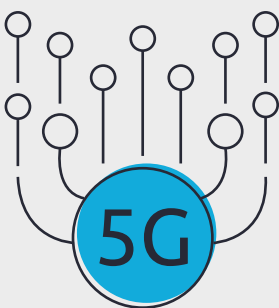
The 5G Lab will therefore enable the following key areas of services for 5G capabilities:





A complete value chain of solutions tailored to support key telco players

- **CSPs:** It offers a capability extension at an optimized cost. This includes a complete 5G portfolio including consultancy, frameworks, value-added feature developments, orchestration, managed services, upgrade features, system integration, application hosting possibilities, and guidance on how to achieve RoI from 5G infrastructure by offering 5G services to private networks.
- **Industries:** It offers dedicated environments to prototype, design and develop innovative connectivity services within a complete 5G ecosystem, and includes a complete portfolio of advisory and engineering services. It also demonstrates the testing and integration of enterprise solutions in an independent telco grade infrastructure.
- **NEPs:** It enables NEPs to accelerate the time-to-market of new products and solutions, supporting all steps of the journey within a complete 5G ecosystem. It provides a platform to demonstrate Capgemini Frameworks which can be used as a base to build custom solutions for various sectors. It also provides consultancy and capabilities to help customers build customized value adds to their solution and help customers with end-to-end testing.



Guidance on how to achieve RoI from 5G infrastructure by offering 5G services to private networks.

Multiple network slicing options available

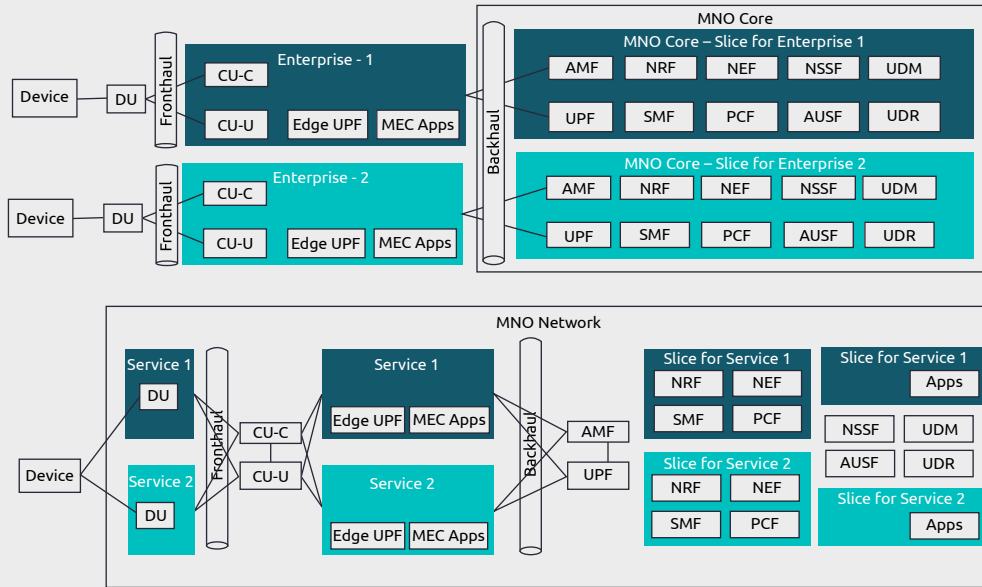


Figure 3: 5G Lab with Network Slicing

5G Lab demonstrates a typical private network deployment with network slicing, in which both service level and operator level slices can be created. For complete segregation, any network functions which can affect the sharing of resources are

segregated as different services, although they remain available on the same VM as different containers. This helps in vertical and horizontal scalability and, at the same time, takes care of security for operators.

CSPs can choose from a selection of roaming support between private networks and CSP networks using any of the following methods and Capgemini network architecture:

Option 1: Using MOCN Gateway

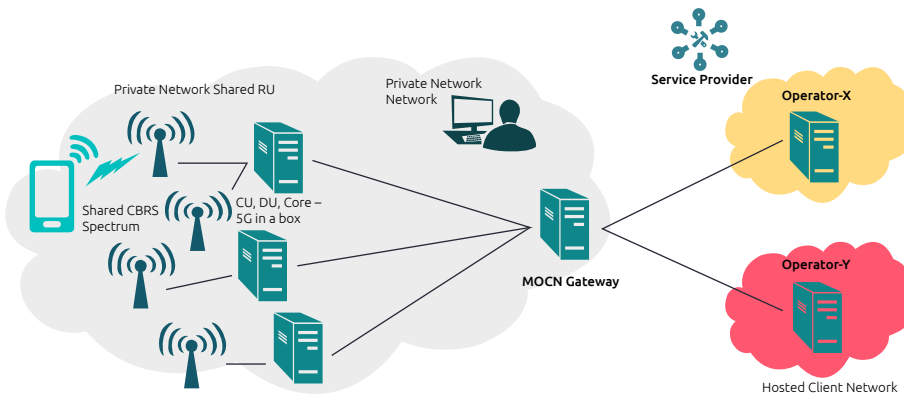


Figure 4: Connectivity with MNO using MOCN Gateway

Key points for connection with this option:

- MOCN Gateway can help optimize the connections to MNO
- All local handovers are locally served
- Optimizes number of connections towards MNO
- Routes traffic to multi-operator core

Option 2: Connecting to MNO using roaming interfaces with Local Breakout

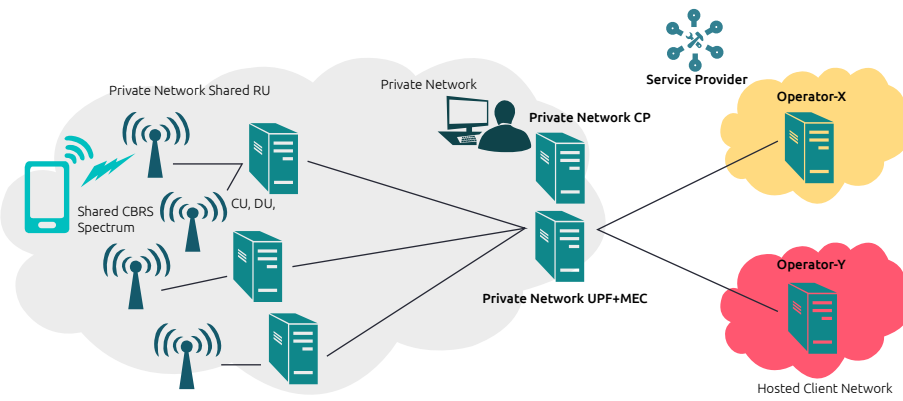


Figure 5: Connectivity with MNO using Local Break out (LBO)

Key points for connection with this option:

- Private Network Core shall behave as a roaming partner for MNO
- Shall be allowed to interface with MNO core for authenticating subscribers
- Slices are locally handled within a private network
- Charging for the subscriber data is locally handled by the private network

Option 3: Using roaming interface with MNO, with home routed cases

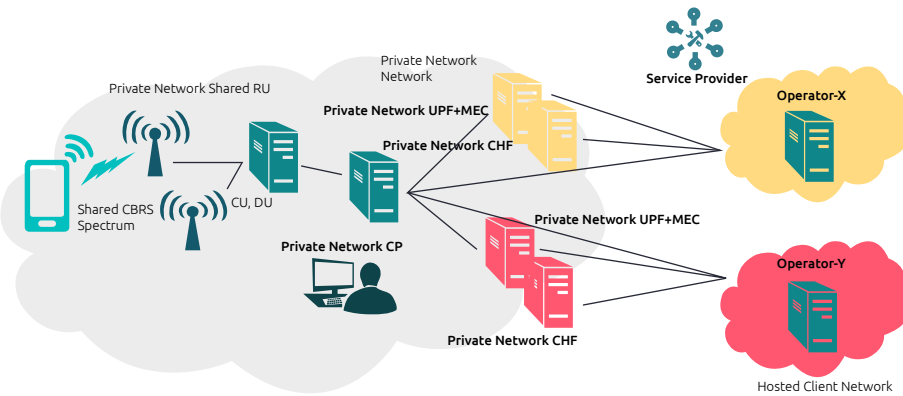


Figure 6: Using roaming interfaces with MNO with home routed cases

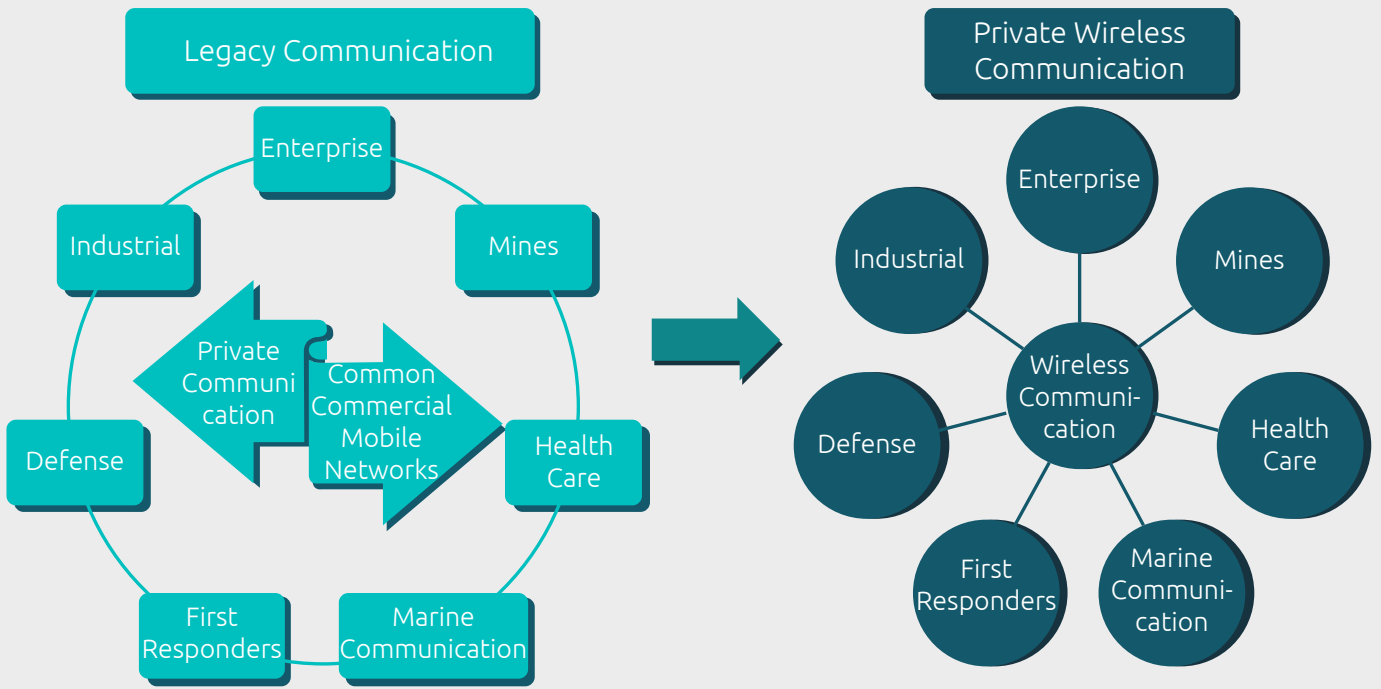
Key points for connection with this option:

- Private Network Core shall behave as a roaming partner for MNO
- Shall be allowed to interface with MNO core for authenticating subscribers
- Charging is locally handled, but in coordination with the home network

Faster transition to 5G

The full potential of 5G technology will be unlocked if businesses and telcos continue to evolve together toward a more symbiotic relationship, and experiment in joint 5G initiatives. These initiatives are primarily focused on developing and deploying initial use cases and services.

When testing the maturity and level of interest among several industries in innovative 5G services, the next urgent question to address is around the industrializing of the design and deployment of 5G services/use cases along with the continuous engineering of networking solutions from connectivity to application layers. In this case, the 5G Lab offers a unique platform to demonstrate Capgemini's end-to-end 5G capabilities and how customers can use Capgemini services for their end-to-end journey.



5G

The 5G Lab offers a unique platform to demonstrate Capgemini's end-to-end 5G capabilities

Why Capgemini

We offer a unique combination of technology expertise, multi-industry knowledge and innovative mindset.





About Capgemini

Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided everyday by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of over 340,000 team members in more than 50 countries. With its strong 55-year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fueled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering and platforms. The Group reported in 2021 global revenues of €18 billion.

Get The Future You Want | www.capgemini.com