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VIRTUALIZED NEXT GENERATION 5G CORE

White label ready solutions that help reduce time to market and risks

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A comprehensive suite of products and services for the Virtualized Next Generation Core (ViNGC)

The 5G system architecture is known to support data connectivity and services, enabling deployments to use techniques such as Network Function Virtualization (NVF) and Software Defined Networking (SDN).

The fundamental principles and concepts of the 5G system architecture are:

- Separation of control plane and user plane, enabling flexible deployments e.g., central and distributed

- Support stateless network functions

- Minimize dependencies between Core network and Access network

- Service-based interactions enabling reuse wherever possible

- Enable network function to interact with other network functions directly

There will be diverse requirements for the 5G network. For instance, in a few cases, very high bandwidth communication is needed; in a few applications, there is a need for ultra-low latency, and in a few others, there are requirements for low data rate communications such as machine to machine and IoT applications. In some other cases, there will be normal voice communications, internet surfing, and all the other applications that we presently are used to. Thus, 5G core networks will provide new capabilities to evolve existing services and create new services.

Capgemini Engineering ViNGC: Enabling OEMs/NEPs to keep up with the pace of fast evolution of 3GPP

Capgemini Engineering ViNGC is a white label ready solution that can be used in various deployment models such as private and public networks, IoT/M2M, and public safety. It enables OEMs/NEPs to reduce time to market and keep up with the pace of evolution of 3GPP. It is highly scalable and can be used as a hosted model on the cloud by customers as well.

There are many value-added features available in core networks, which are over and above the compliance specification. ViNGC can be deployed both as a collapsed core or as a distributed core based on the deployment requirements. The 5G core network functions can run as containerized applications in the public or private cloud and cloud native environments such as Kubernetes and OpenShift, thereby reducing the total cost of ownership.

Following are primary industries our core network solution can be used for:

- Enhanced mobile broadband for private and public networks

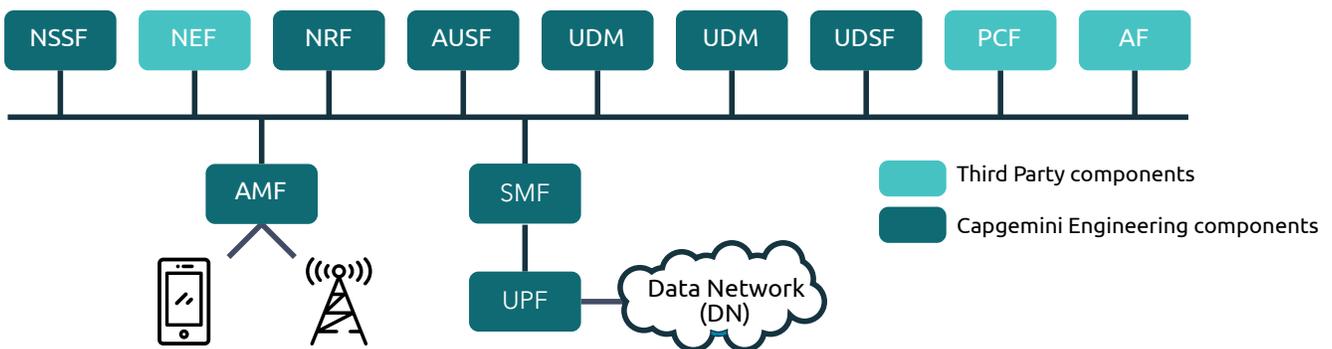- Rural and enterprise networks

- Massive IoT/M2M networks

- Public safety

- Fixed wireless access

- MVNO deployments

- CBRS deployments

- Local offloading

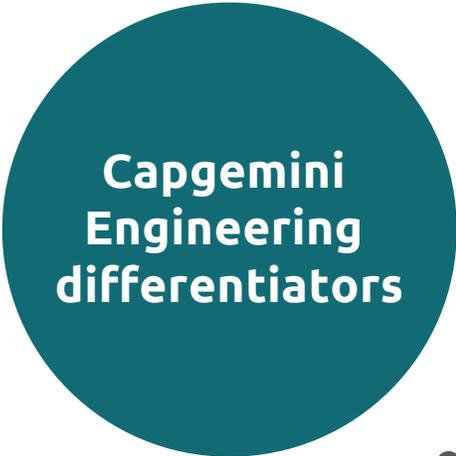- Niche deployments such as ad hoc networks, mining solutions, etc.

Key features

Capgemini Engineering ViNGC is an optimized virtualized core network for 5G standalone deployments. It delivers high levels of orchestration and automation for operational efficiency, only enabled by a microservices architecture. It consists of network functions including AMF, SMF, UPF, UDM, AUSF, UDR, UDSF, NSSF, and NRF. The core follows a Service-Based Architecture (SBA) where network elements advertise themselves and provide services, which can be consumed by other network elements in the core via APIs. This allows for the adoption of web scale technologies and software into telecom networks.

Key features of Capgemini Engineering ViNGC are:

- Microservices based architecture. There are custom microservices in addition to the ones specified by 3GPP for optimal performance

- Compliant to service-based architecture

- Stateless architecture complying to cloud native principles

- Complying to CUPS architecture with scalable data plane for higher throughput

- Ability to run on Kubernetes, VMs, and standard COTS server

- Representational State Transfer (REST) based configuration, provisioning, and monitoring. A dedicated microservice exposing REST APIs for configuration and monitoring, thus having a single O&M interface for configuration and monitoring of all network functions

- Highly scalable with auto-scale capabilities in environments such as Kubernetes

- Integrated with Jenkins for continuous integration and development

- Integrated with ELK/EFK for logs and metrics

- Software updates with zero downtime through rolling updates

NSSF   NEF   NRF   AUSF   UDM   UDM   UDSF   PCF   AF

AMF   SMF   UPF   Data Network (DN)

Third Party components

Capgemini Engineering components

Why Capgemini Engineering?

Capgemini Engineering differentiators

- Interoperated with 5G gNB and real 5G SA UE
- White label ready solution
- Cloud ready: available on docker containers, VM platform, and COTS servers
- CUPS architecture and DPDK based optimized data plane
- Easily customizable
- Source code solution available
- Deep expertise in the wireless domain in product development and services including 2.5G, 3G, and 4G

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About Capgemini Engineering

Capgemini Engineering combines, under one brand, a unique set of strengths from across the Capgemini Group: the world leading engineering and R&D services of Altran – acquired by Capgemini in 2020 – and Capgemini's digital manufacturing expertise. With broad industry knowledge and cutting-edge technologies in digital and software, Capgemini Engineering supports the convergence of the physical and digital worlds. Combined with the capabilities of the rest of the Group, it helps clients to accelerate their journey towards Intelligent Industry. Capgemini Engineering has more than 52,000 engineer and scientist team members in over 30 countries across sectors including aeronautics, automotive, railways, communications, energy, life sciences, semiconductors, software & internet, space & defence, and consumer products.

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