**A Literature Survey on Service-Based Architecture for 5G Core Networks**

A revolutionary age in communications is about to begin with the introduction of 5G technology, which promises previously unheard-of improvements in latency, speed, and connectivity. The 5G Core Network, a complex infrastructure that powers the upcoming generation of communication services, is at the centre of this dramatic change. The classic monolithic design of earlier generations is no longer able to meet the changing needs of 5G networks, as demand for improved capabilities and effective resource management increases.

The industry has focused on Service-Based Architecture (SBA) as a major paradigm shift in the deployment and design of 5G core networks as a response to this difficulty. With network capabilities enclosed as separate services, SBA offers a modular and flexible approach that facilitates easier scalability, interconnection, and adaptation of changing network conditions.

With an emphasis on 5G core networks, this literature review attempts to give a thorough overview of the rapidly changing field of SBA while shedding light on the fundamental ideas, difficulties, and new developments influencing the construction and functioning of these networks in different service-based domains.

* [Service-Based Architecture for 5G Core Networks](https://www.3g4g.co.uk/5G/5Gtech_6004_2017_11_Service-Based-Architecture-for-5G-Core-Networks_HR_Huawei.pdf)

Summary: A new 5G system architecture (5GS), comprising 5G New Radio (NR) access and a new 5G core network (5GC), is being developed by the 3GPP standards development organization to address the demands of new services with a wide range of demanding performance requirements across industries. The commercial viability of 5G depends on this new core since it will allow new service kinds and cloud economic benefits. The service-based architecture (SBA) being developed for 5GC is the main topic of this article, which also explains why it can be deployed on cloud infrastructure and fulfil future service requirements. The SBA and the more well-known point-to-point (P2P) architectures designed for mobile core networks are contrasted in the study. This diversity of services needs to be enabled at a fair cost via the new 5G system architecture and core network. Using a service-based architecture to provide both functional and service agility. Two representations of the 5GC architecture are identified in the document titled "System Architecture for the 5G System": a services-based representation and a point-to-point representation. This approach enables multi-vendor networks by connecting various network operations via standardized interfaces. This has been useful to mobile operators for many years and is widely understood both conceptually and practically.

* [NGMN Service Based Architecture in 5G](https://www.ngmn.org/wp-content/uploads/Publications/2018/180119_NGMN_Service_Based_Architecture_in_5G_v1.0.pdf)

Summary: The NGMN Board adopted the work item "Service-based architecture in 5G" in March 2017. This work group's primary goal is to evaluate high-level specifications, use cases, and guidelines for operators to effectively deploy and manage a service-based 5G network. Specifically, this work group aims to: - Determine high-level specifications or guidelines on service-based architecture design in 5G, including network function, interface/protocol, and API design principle; - Examine how operators can best utilize service-based architecture in 5G, such as customized network slicing and dynamic feature updating and management. Samples, potential strategies, and guidelines are anticipated. - Look into ways that the service-based architecture might facilitate network exposure, such as letting third parties access the network and its functionalities for value-added services. It requests industry collaboration on development, standardization, and development and promotion of the service-based 5G architecture.

* [Micro-Operator driven Local 5G Network Architecture for Industrial Internet](https://www.researchgate.net/publication/330599318_Micro-Operator_driven_Local_5G_Network_Architecture_for_Industrial_Internet)

Summary: Apart from the considerable adaptability and personalization needed by various industry sectors, 5G necessitates a network design that guarantees really fast and incredibly dependable communication channels. Micro-operator (uO) is a revolutionary idea that allows a diverse range of stakeholders to manage local 5G networks within their buildings with guaranteed quality and reliability, thereby complementing the offers of mobile network operators (MNOs). The descriptive architecture we present in this work offers location- and user-specific services in a geographically constrained context for developing 5G uOs. The architecture in a smart industrial setting that complies with Industry 4.0 standards is explained in terms of network functions and operational units, which include the core and radio access networks. Furthermore, we offer simulation results for the latency measurements of the suggested uO architecture with regard to an augmented reality use case in industrial internet in order to implement the conceptual design. Here, we go over the advantages of uO-driven local 5G networks for specific user needs versus sticking with the traditional strategy that allows MNOs to be the only ones able to install cellular networks.

* [Slicing on the Road: Enabling the Automotive Vertical through 5G Network Softwarization](https://www.researchgate.net/publication/329668641_Slicing_on_the_Road_Enabling_the_Automotive_Vertical_through_5G_Network_Softwarization)

Summary: Fifth generation (5G) systems face significant problems and opportunities because to the demanding needs of Vehicle-to-Everything (V2X) applications, which include ultra-low latency, large bandwidth, highly reliable connection, heavy compute, and near-realtime data processing. Network slicing presents itself as a leading option to provide V2X over forthcoming programmable and softwarized 5G systems in a business-agile manner by enabling an operator to flexibly deliver specialized logical networks with (virtualized)functionalities over a common physical infrastructure. In order to facilitate V2X applications by extensibly orchestrating multi-access and edge-dominated 5G network infrastructures, a network slicing architecture is proposed in this research along with pertinent building blocks and procedures, particularly with reference to roaming scenarios.Utilizing the Mininet emulator, proof of concept trials demonstrate the practicality and possible advantages of the suggested framework for cooperative driving scenarios.

In conclusion, this literature survey has navigated the expansive landscape of Service-Based Architecture (SBA) for 5G Core Networks, shedding light on the pivotal role it plays in ushering in a new era of communication. The introduction of 5G technology brings forth unprecedented improvements in latency, speed, and connectivity, necessitating a departure from the traditional monolithic architectures of yesteryears. The adoption of SBA emerges as a strategic response to the dynamic demands of 5G networks, offering a modular and flexible framework that promises scalability, interconnectivity, and adaptability to the evolving network landscape.

The survey delved into key resources, notably exploring a comprehensive overview of Huawei's insights on SBA implementation in 5G core networks. This resource highlighted the significance of SBA in enabling multi-vendor networks through standardized interfaces, emphasizing the importance of functional and service agility.

Furthermore, the examination of the NGMN's work on Service-Based Architecture in 5G elucidated the industry's collaborative efforts to establish high-level specifications and guidelines. This work group strives to empower operators with the knowledge to effectively deploy and manage service-based 5G networks, paving the way for customized network slicing and dynamic feature updating.

The survey extended its exploration to innovative applications, such as the Micro-Operator driven Local 5G Network Architecture for Industrial Internet. This resource introduced the concept of micro-operators managing local 5G networks, catering to specific user needs and challenging the traditional monopoly held by mobile network operators.

Lastly, the survey delved into the role of network slicing in enabling the automotive vertical through 5G network softwarization. The proposed architecture showcased the potential of network slicing to provide specialized logical networks for V2X applications, addressing the diverse requirements of ultra-low latency, large bandwidth, and highly reliable connections.

As we conclude this literature survey, it is evident that Service-Based Architecture stands at the forefront of shaping the future of 5G core networks. The collective insights from industry experts and innovative applications underscore the transformative potential of SBA, paving the way for a connected world that is not only faster and more reliable but also tailored to meet the specific needs of diverse industries and applications. The journey towards realizing the full potential of 5G continues, with SBA serving as a cornerstone for the architecture of tomorrow's communication networks.