

ANALYSIS OF 5G NETWORK SLICING

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ABSTRACT

Network slicing is a smart application idea for the Internet of Things that is becoming more popular. There are a variety of factors that affect network slicing, including resource levels and physical infrastructures, critical enablers, and security. 5G network slicing is made possible by the use of Software-Defined Networking, network service virtualization, and cloud computing technologies. Using slicing, the process is made more controllable and efficient as a result of its overall effectiveness. Customer service is crucial to a company's long-term existence and profitability after it has completed product development and distribution.

Keywords: Network Slicing, Customer Service, Profitability, Distribution.

I. INTRODUCTION

As a guide for communication among members of a development team, the software architecture acts as a model. The software industry is expanding at a rapid speed, which means that testing and maintenance may begin almost immediately after a program is built and launched.

Several publications, including Understanding Software Architecture and Dependency Analysis, Software Architecture Slicing, and Dynamic Software Architecture Slicing, provide in-depth coverage of this subject. This system featured a restricted amount of capacity, poor voice quality, inconsistent handoff, and no security protection.

Quality of service (QoS) has transferred from the level of the equipment to the level of the network throughout time, and this trend will continue in the future generation of networks. Prioritizing traffic, particularly, video and VoIP traffic will aid in the management of traffic congestion.

Using slicing, the process is made more controllable and efficient as a result of its overall effectiveness. Customer service is crucial to a company's long-term existence and profitability after it has completed product development and distribution.

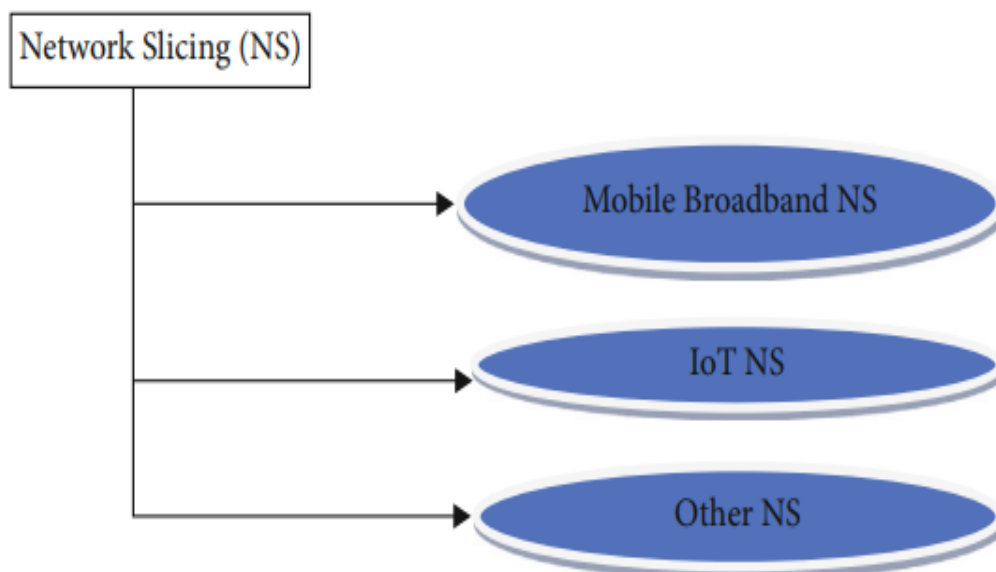


Fig 1: Network slicing in 5G network functionality.

	4G	5G
Architecture and Flexibility	4G networks have limited network connection capacity compared to 5G.	5G networks are primarily designed to enable network slicing.
Slicing Customization	While 4G networks can accommodate some customization, the level of detail and customization options are much more limited than 5G.	5G network slicing has more flexibility. Service providers can create plans with precise configuration, resource allocation, and quality of service (QoS) features to meet the characteristics of various applications and use cases.
Network Efficiency and Resource Allocation	In 4G networks, the allocation of resources to network slices may not work well and 5G is fine-tuned.	5G networks are carefully designed to optimize the allocation of network resources to achieve better services and better performance.
End-to-end network slicing	In 4G networks, network slicing is usually limited to the radio access network (RAN) and core network.	5G enables end-to-end network slicing covering the entire network infrastructure, from the RAN to the core and transport network.
Slice Isolation and Security	Although the network slice in 4G can be isolated to some extent, it will be more difficult to achieve complete isolation due to design constraints.	5G network slicing provides strong separation of slices, allowing each slice to operate independently with minimal interference or interference from other slices. Improved security mechanisms in 5G contribute to better isolation and overall network security.

II. METHODOLOGY

Dynamic spectrum slicing is important for slicing networks as a result of the increasing demands of consumers. There will be underutilization or overutilization of the spectrum in the fixed spectrum slicing scenario. When we speak about security mechanisms, adaptive security mechanisms are a kind of security mechanism that will change based on the circumstances.

In particular, network slicing raises significant and difficult security challenges, especially for systems that run at many infrastructures layer levels at the same time. A few of the security concerns that must be taken care of are as follows: security based multidomain, security-based interslice, and security-based intra slice. If you use a traditional machine learning-enabled network, there might be an issue of having your information lost.

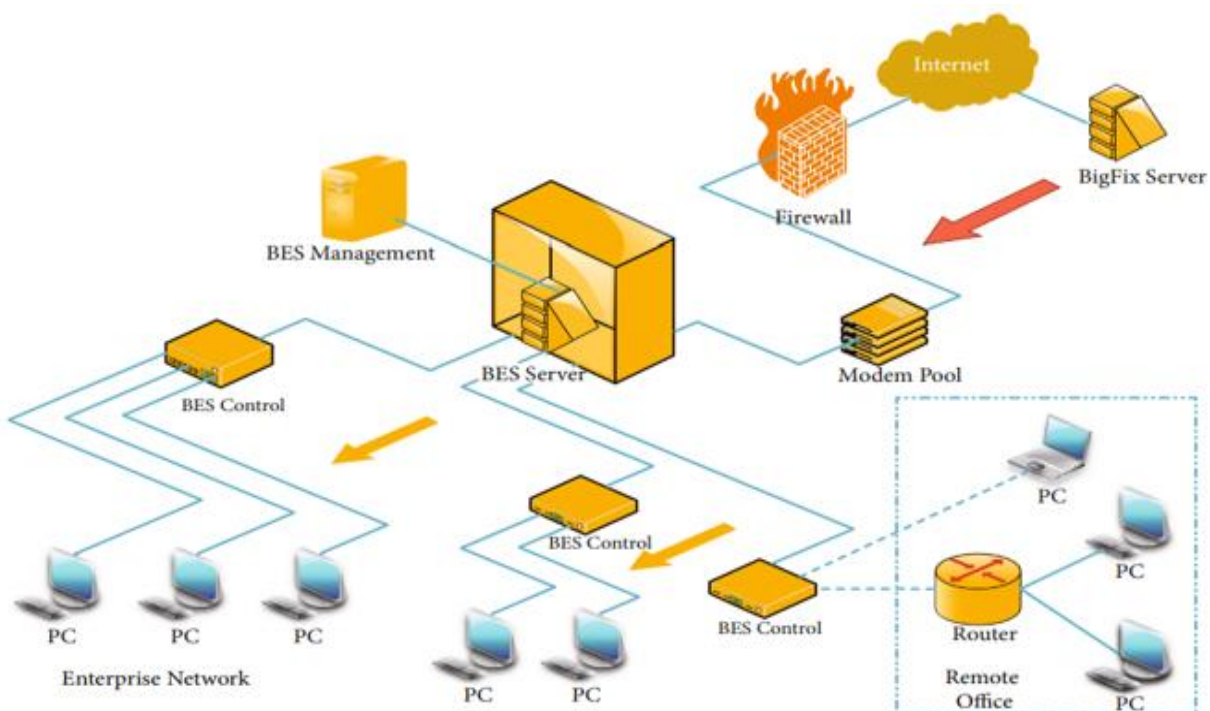


Fig 2: Methodology Of Proposed Work

III. WORKING PROCESS

Network slicing layer isolation is the physical, language based, or virtual-machine-based. Network slicing is to produce separate slices of a network based on various qualities like low latency, high bandwidth (network capacity), and mobile broadband. 5G network slicing will be having various concerns. For example, in 5G networks, radio-access networks must integrate network slicing and advanced network architectures.

1. Selecting the Network Area: the network slicing process the first task is to identify and select the network area where the virtual network slice will be deployed.

2. Find Scope and Requirements: After determining the network area need to outline the scope of the network slice. This step involves specifying service requirements, performance goals and quality of service (QoS) parameters for the slice.

3. Create Network Slice: Once that have defined the scope and requirements it's time to bring our virtual network slice into existence.

4. Use Technology and Orchestration: Network slicing in 5G heavily relies on advanced technologies and orchestration mechanisms to efficiently manage and control the virtual slices.

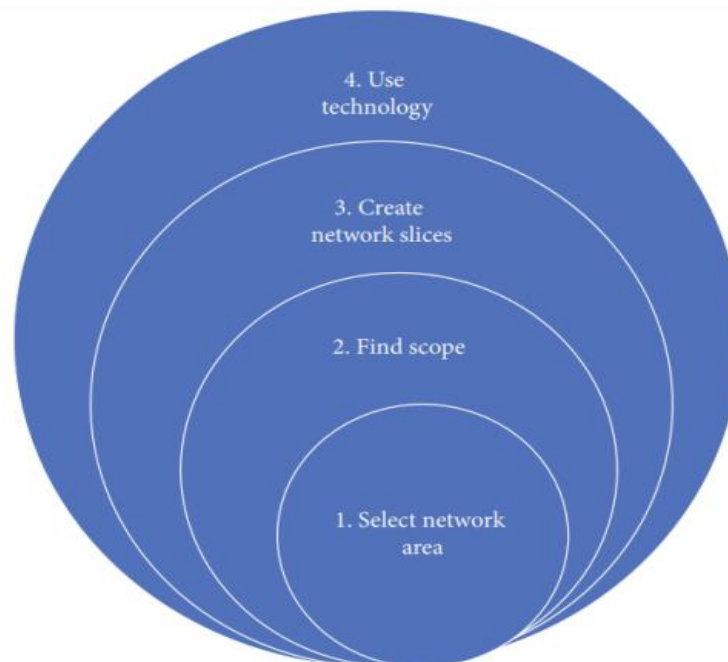


Fig 3: Processing steps

IV. RESULTS AND DISCUSSION

(i) Chaining of intelligent service functions(also known as service function chaining). The fundamental need of implementing intelligent service function chaining is to be able to operate on a variety of network services on a single node or across numerous nodes by making use of virtual machines running on different types of nodes.

(ii)Slicing when we consider, resource allocation in smart applications, network slicing is one of the most challenging problems to solve. There are also a range of challenges to deal due to very high density of 5G networks as well as the handovers for different access networks.

5G Challenges to 6G Opportunities

6G network slicing aims to solve the problems faced by 5G network slicing and strengthen the virtual network segmentation capability. In 5G, scalability and flexibility became a concern as mobile phones continued to grow, leading to legal issues. 6G tries to overcome this by using advanced technologies such as terahertz frequency and large MIMO to support more devices , network connections as well as flexibility.

Adoption of the protocol in 6G will facilitate collaboration between slices of different service provider and address the concerns of vendors, especially in 5G.

V. CONCLUSION

The latest technology industry indicate that network slicing will be a important aspect of 5G networks in the near future. Network slicing techniques cannot work proficiently unless the underlying network architecture is virtualized, and the right software is installed. In order to make the architecture still more flexible and dynamic, SDN (Software-Defined Network) ideas were included in 5G network technology. This allows for a more range of applications to be constructed in today's modern environment. Network slicing is also a new technology that is allowing the strategy to change old cities into new smart ecosystem cities while also considerably improving the quality of life for the common people.

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