5G Network Slicing: A Security Overview   
by

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**Abstract**

The research paper by Olimid and Nencioni, is about the fast growing 5G cellular network Slicing technology which are soon getting commercialised by the manufacturers. There is demanding need to cover the security aspect of 5G network slicing. This article highlights possible security threats and recommendations at each stage life-cycle, intra-slice and inter-slice security of the 5G network slicing. Rapid growth in technology research has ever rising demand of having faster better and performance reliable network service. This has brought up the slicing feature which is explained briefly with architecture details that provides differentiated services as per the service application.

The 3GPP i.e. Third Generation Partnership Project established the fundamentals of 5G network slicing. The Network slicing is in category of virtualisation networking paradigm that deals with logical partitioning of the network just like SDN and NFV. The Network slicing enables flexible and efficient creation of logical networks on top of shared network infrastructure. Each logical network serves different type of service with different heterogenous requirements to facilitate vertical industry. 5G slicing is characterized as – enhanced mobile broadband, ultra-reliable low latency communication, massive machine type communication. Above concepts explained on page 3 of the article gives a detailed Architecture to understand the slice layers in 5G Network. You can find details at 3.A in the article where the author have briefly described Architecture related functions and its importance. It also explains more of the Slice Life Cycle in part 3.B.

Furthermore, the authors have identified the key security threats for each lifecycle phases, intra-slice and inter-slice of the 5G Sliced Network. The key findings of this paper, is the necessity of having a good, secured network with advancement of 5G slicing, its threats and mitigation strategies. Since 5G is an evolving field and yet to be applied to full-fledged utilization we need to have robust security and mitigation plan to avoid any serious attacks.

To Conclude on the security threats and plans to mitigate the same while considering the 5G network slicing we need to have additional considerations on facts and figures which should be more robust and optimized way to tackle the security threats to avoid any possible security breach in the network

**Shortcomings of research article**

5G network is evolving technology and has disruptive potential which will be transforming the mobile technology than previous generation shifts(2). Hence, the article with in-depth security overview is premature.

As the research article is quite confined to the structure of 5G Slice and its security threats with recommendations, it is not focusing on various other streams of emerging technologies like Millimetre waves, small cells, massive MIMO, Beam formation, MIMO, full duplex and network virtualization(3). The Author did not consider beyond the current basic application to research more on the plausible challenges faced on security front.

The article does not highlight the benefits of slicing mentioned in the reference page – (4) where it states that 5G network slicing is more resilient to threats due to segmentation of application based layers and even if compromised it will be within the slice unaffected to other slices. Every slice can be customised based on access policies, firewall configuration and packet inspection. All configurations are dynamic in nature applicable to each slice.

Although all these research do consider the best applications and innovations they also need to consider the amount of data flow and privacy breach that could possibly happen in the process. Unless an effective and thoughtful approach is implemented within each slice we cannot guarantee the data privacy as it will be biggest concern for 5G networks.

Going beyond each slice security, for inter slice communications there are there are many security concerns which are of prime importance to be considered(5). The author has mentioned about inter-slice security threats at a higher level but could be more investigated on ground level to 5G networks. Multiplicity of stakeholders and authorities in case of network slicing raises serious challenges(6).

The more we explore more on the user end and areas of vulnerabilities, the more we’d discover. The research article is quite confined to what is already given and the basis of which the things are derived and noted. Instead there should be more practical approach to tackle the current Security challenges directly by consulting the customers. Otherwise it is advisable to have more deep research on threats with the current system and finding out all the flaws in rules and regulations set for 5G network Slicing. Since it is quite new there are a lot more possible flaws in the model and needs to be improved. This initial research will help for long term and larger part of the network community in coming years to avoid any huge losses in case of compromised system. The current research article can be evolving, 5G Network Slicing is taking time to evolve and adapt in incoming network changes, it is necessary to consider all aspects and its outreach in security threats.

**Conclusion**

The article rightly cover up the Architecture and Network slicing layers the way they are communicating between themselves and how it would affect the upcoming challenges in the field of 5G network utilization. There are innumerable threats which are opened up with the introduction of new technologies. And one must consider all aspects of these threats to overcome and plan accordingly to avoid them. However, the paper – ‘5G Network Slicing: A security Overview’ does not cover the various aspects and all areas that the authors should have covered as a part of this research. There are various inter-slice security concerns raised and need to be addressed as we advance in the field of 5G networks. This will give immense regularity precursor to build a threat free network slicing for the future.

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