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A STATE OF THE ART REVIEW ON 5G NETWORKS

Chethan G S
Faculty of Engineering and Technology
Jain (Deemed-to-be University) Ramnagar District, Karnataka – 562112
Email Id- gs.chethana@jainuniversity.ac.in

Abstract

As an enhancement of cellular networks, the future-generation 5G network can be considered an ultra-high-speed technology. The proposed 5G network might include all types of advanced dominant technologies to provide remarkable services. Consequently, new architectures and service management schemes for different applications of the emerging technologies need to be recommended to solve issues related to data traffic capacity, high data rate, and reliability for ensuring QoS. Cloud computing, Internet of things (IoT), and software-defined networking (SDN) have become some of the core technologies for the 5G network. Cloud-based services provide flexible and efficient solutions for information and communications technology by reducing the cost of investing in and managing information technology infrastructure. In terms of functionality, SDN is a promising architecture that decouples control planes and data planes to support programmability, adaptability, and flexibility in ever-changing network architectures.

Keywords: *Long-Term Evolution (LTE), 5G, Software-Defined Networking (SDN), Internet of things (IoT), Quality of Service (QoS).*

I. INTRODUCTION

During the last decade, mobile networking and cellular networks have progressed phenomenally. The creation of 3G and 4G wireless networks has been encouraged by the ever-increasing demand for resources, especially for multimedia data, with high quality of service (QoS) requirements [1]. Nevertheless, the successes of technological progress do not satisfy the right degree of satisfaction. The notion of 5G networks serving networks beyond 4G has therefore become the need of the hour [2].

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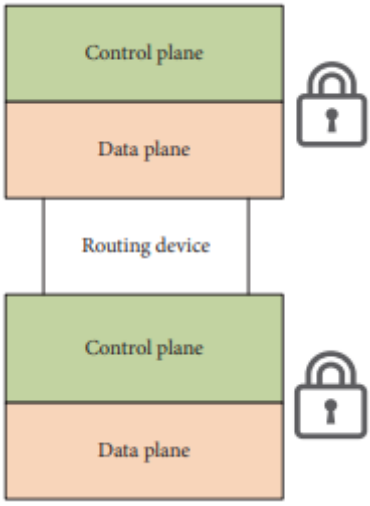

Fig. 1 Shows the traditional hardware-based network

The concept of next generation networks tends to be the preparation for future network architecture (NGN). NGN, a big concern for the Internet Protocol-based (IP-) future of mobile network technology, is seen as a cost-cutting integration of communication networks and provides centralized services across a core backbone network [3][3]. Three distinct advantages of different networking systems are inherited, namely, layered structure, common interfaces and various services, and functions that can be implemented in multiple layers spanning from MAC to application. NGN has become a moving pattern for implementation with the rise in the number of Internet users and QoS specifications [4]. The convergence of user access and integrated communication network services with IP technology has been created. The conventional hardware-based network is shown in figure 1. Comparison of Figure 2 between SDN. Figure 3 displays SDN layers, planes, and functionality, and the Open Flow model is shown in Figure 4.

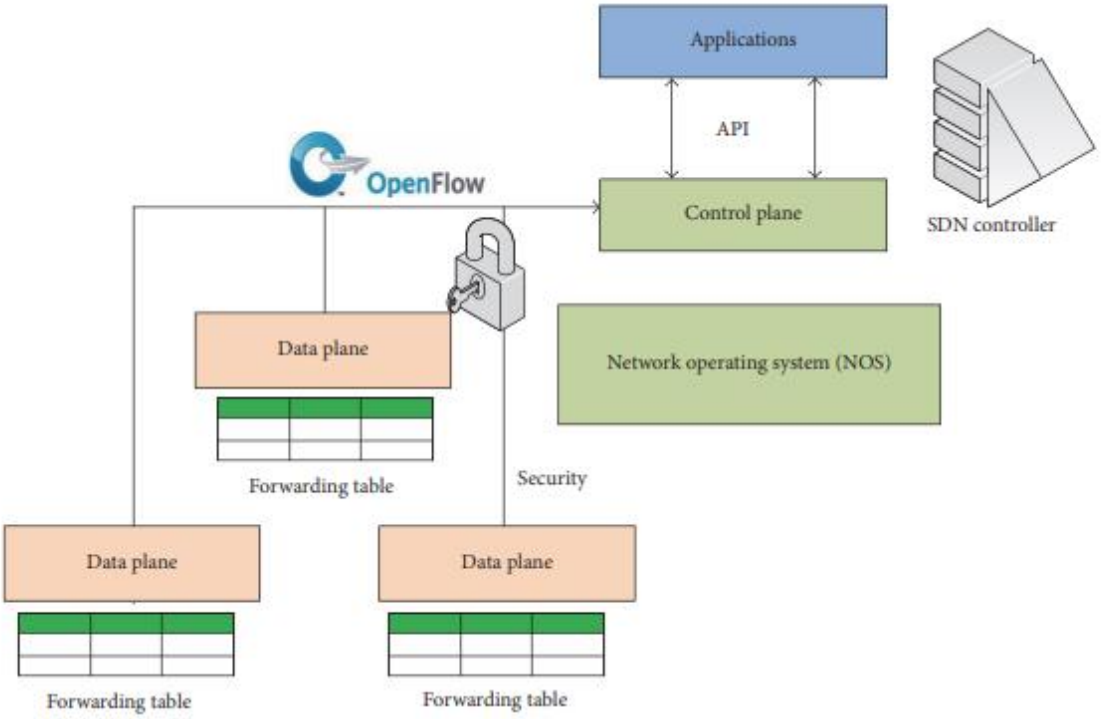

Fig. 2:Comparison between SDN [5].

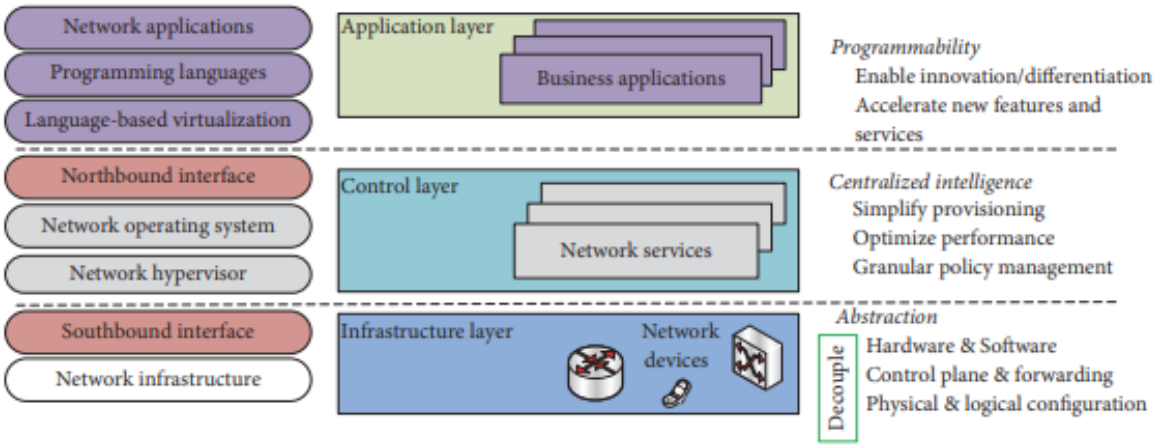

Fig. 3 SDN layers, planes, and functionalities

II. LITERATURE REVIEW

A survey was performed on 5G networks by Zhang et al. The 5G framework aims to deliver higher speed, lower latency, and vast connectivity to different devices by incorporating the advancement of 4G with the incorporation of advanced radio technologies, service-based architecture, and cloud infrastructure to serve numerous new usage cases from vertical industries in addition to enhanced mobile broadband networking services. The implementation of emerging technology, new use cases and the growing concern of people about privacy issues

presents new challenges for 5G to provide security and protection of privacy. This paper makes an extensive review of the state of the art towards ensuring 5G security and privacy.

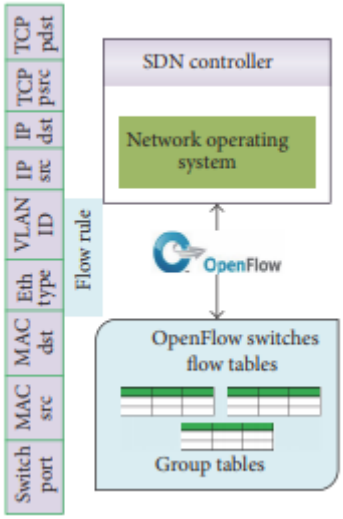

Fig. 4 Open Flow model

III. DISCUSSION AND CONCLUSION

The next decade's expectation of a future mobile device or wireless network needs high-speed access without time and location constraints. As a consequence, high data rate, real-time data handling, minimal latency for centralised views of the entire network, higher security, less data loss, and lower error rate must be addressed by the NGN. For universal network infrastructures, the implementation of high data traffic and high QoS technologies depends on the integration of new technologies or services with the existing network infrastructure. In this report, we discussed the architecture of the network, the service system, and topologies that will play an important role in meeting the needs of the future network infrastructure of the 5 G network. The criteria for 5 G will be massive IoT networking, immersive experience and media, and real-time communication. The 5G architecture would also be such that the flexibility and scalability of the future network is maximised. The potential network will also rely on the combination of emerging technologies such as cloud computing, SDN, NFV, and E2E networking infrastructure.

IV. REFERENCES

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