

An M-CORD architecture for Multi-Access Edge Computing: A review

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Abstract-- The advent of newer generations of mobile wireless standards allow for the network providers to offer better, faster and more reliable connections. The roll-out of 4G boasted five times faster data transmission than the existing 3G technology, and consequently, the 5G would allow for at least three times the transmission speed that is offered by 4G. M-CORD built on the pillars of SDN, NFV and cloud technologies [1] is an open source solution which makes use of open source software, disaggregation, and virtualization of RAN and core functions of the mobile wireless networks. M-CORD provides a state-of-the-art platform for rapid innovation and community participation which allows for the realization of the 5G technology. The experience that a user has on a 5G network would be unparalleled to any previous technology. 5G boasts of a minimum connection speed of 10Gbps with a maximum delay of 1 millisecond round trip delay. The near-perpetual availability and broader coverage would also aid the user.

Keywords: M-CORD, 5G.

I. INTRODUCTION

The earlier technologies heavily relied on data centers [2] which had to perform all the processor intensive tasks along with its core functionalities. The maintenance of several data centers across the globe is a costly affair. Further, this not only inhibits the functionalities that the companies can provide to its customers but also compromises on the QoE that the user has. The latency between the actual transmission of data and the receipt is more than what can be ignored [3]. The QoS provided hence could be revamped by the upcoming 5G technology, which would have a central office instead of several data centers. Figure 1 shows

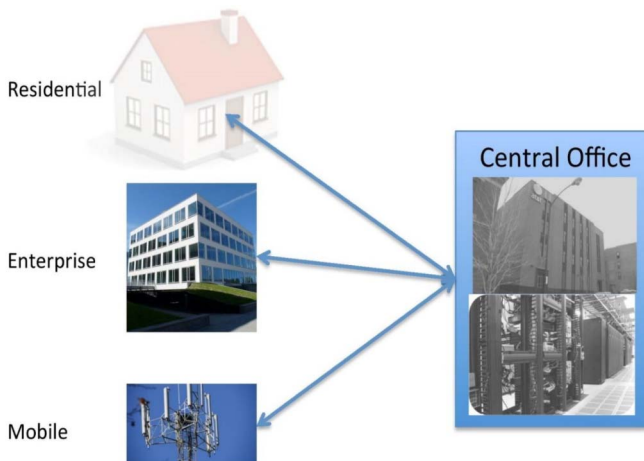


Fig 1. Central Office and its association with subscribers.

how the central office would be associated with the different class of subscribers and would enable the telecom companies to provide a solution from a single point of presence. The central office would have all the core network functionalities.

II. ARCHITECTURE

The way that M-CORD helps is to allow for testing as well as development in a coordinated manner. Mobile infrastructure needs restructuring to enable 5G which is a resource-intensive task, hence M-CORD comes to the rescue in this regard and allows for resource utilization, especially spectrum. It would enable the service providers to offer customized service which in turn would lead to better QoE to the customers. Figure 2 provides the architecture for the M-CORD [4].

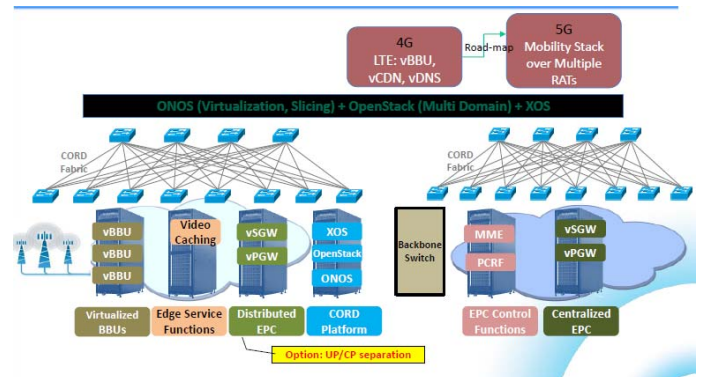


Fig 2. The M-CORD architecture

It is agile and is a cost-efficient deployment process which significantly reduces the capital expenditure (CAPEX), which can be a significant roadblock in the development of new technology. Reduction of capital and operational expenditure allows the network providers to provide more services at the same cost which in turn enhances QoE. Figure 3 shows the basic overview of M-CORD [5].

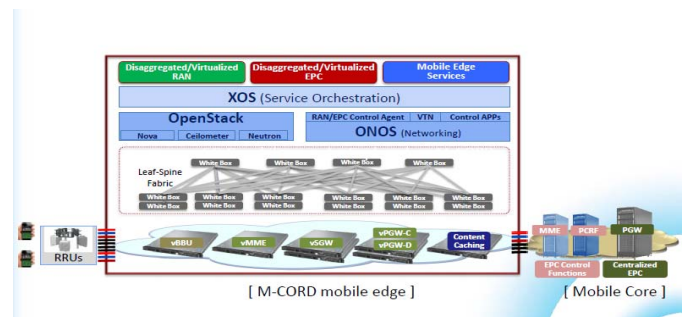


Fig 3. The M-CORD overview

It provides many open network solutions such as Monitoring as a service(MAAS) and the CORD Controller (XOS).

III. USES

The upcoming 5G technology would also incorporate Safety as a service (SaaS), which would be crucial in bypassing credit checks and providing maximum bandwidth irrespective of the user's affiliation to a network provider. It is also expected to go beyond the voice calls which would support sharing location details and video calls [6]. M-CORD aims to provide enhanced resource utilization by providing real-time resource management, monitoring the framework and exploiting the use of multiple Radio Access Technologies (RATs). The model provided a virtualised and disaggregated RAN and EPC use commodity hardware and open source software resulting in a low cost and an efficient deployment. CORD architecture combines open-source projects like OpenStack, Docker, XOS and ONOS to create an integrated platform to provide a service delivery platform. ONOS refers to the Open Network Operation System which uses the leaf-spine topology by controlling the underlying white box switch fabric. Assembling and composition services are the functions performed by XOS operating system. OpenStack and Docker are used to perform the cloud datacenter management and to interconnect services inside the software containers. The technology is aimed not only at mobile users but also to a host of devices that are expected to be connected to IoT by the end of this year. The bandwidth requirements would grow manifold after the devices get connected and would also require a network which would make use of less power. The upcoming 5G technology would enable low-power devices to run for up to 10 years without needing another charge. It would also have a significantly low latency which would enable us to circumvent the primary roadblock of network delay in the realization of self-driving cars. Furthermore, the lower latency would enable surgeons to perform surgery with injected Nanoparticles in real-time. Also, this could revamp the healthcare industry and would prove to be a boon for innumerable users. Figure 5 shows the uses of 5G.

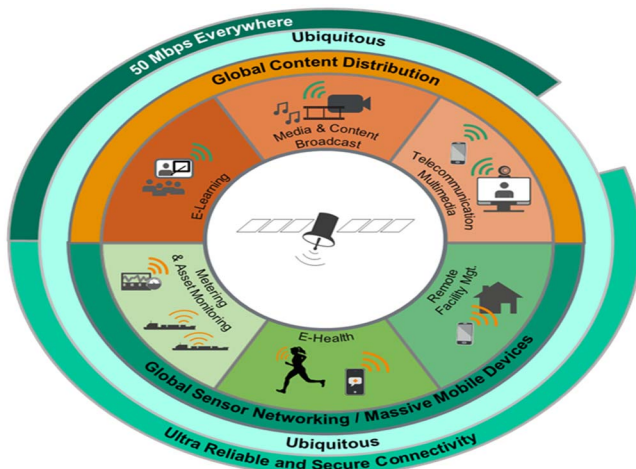


Fig 5. Uses of 5G in various streams

IV. CONCLUSION

The need for faster and a better connection is rising by the day. Given their current infrastructure, the sheer number of devices that are connected to the internet already is proving to be a cause of concern to the network providers and the number is only rising. The need for a technology that would facilitate the same without requiring a significant investment is what would benefit not only the network providers but also help save a lot of resources that could be used otherwise. The M-CORD platform not only facilitates that but also goes beyond that by allowing for collaborative development and leverages merchant silicon. The platform relies heavily on open source solutions and hence drives down the cost further. The ease of use coupled with a robust and an economic environment makes M-CORD very attractive to the developers. Although the technology has a lot to offer, there are certain concerns that need to be addressed, such as, the need for rapid development in the field also requires us to develop the platform fast. Also, platform downtime and build issues need to be addressed. Many companies have already invested in this project and are supporting the development of 5G employing M-CORD. 5G would truly make our world connected and aid technologies that haven't been realized yet because of the current limitations.

V. REFERENCES

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