Mobile Edge Computing

Honey Charnalia
Riu Global Services Pvt Ltd, H-401, Chintels Paradiso, Sector 109, Gurugram 122017, Haryana, India
honey.charnalia@riuglobal.com

Abstract-- **Mobile Edge Computing (MEC) is an emerging technology that enables computing capabilities and services to be deployed at the network edge, closer to mobile users. MEC offers a range of benefits, including lower latency, reduced network congestion, and increased security. This paper explores the concept of MEC and its usage in 5G networks, highlighting the technical specifications and standards set by 3GPP (3rd Generation Partnership Project). The paper also discusses the way forward for MEC deployment and the need for professional help in implementing this technology.**

Keywords: Mobile edge computing, 5G networks, 3GPP, Latency, Security,

I. INTRODUCTION

THE emergence of 5G networks has created a need for low-latency services that require computation and storage resources to be located closer to mobile users. Mobile Edge Computing (MEC) is a network architecture that meets this need by bringing computation and storage resources closer to mobile users. This paper explores the concept of MEC, its benefits, and its usage in 5G networks. The paper also highlights the technical specifications and standards set by 3GPP, and the need for professional help in implementing this technology.

II. WHAT IS MOBILE EDGE COMPUTING?

Mobile Edge Computing (MEC) is a network architecture that enables computation and storage resources to be located closer to mobile users. MEC is also known as Edge Computing or Fog Computing. MEC can be deployed at various points in the network, including base stations, small cells, and access points. MEC enables low-latency services, such as virtual reality, augmented reality, and autonomous vehicles, by reducing the time taken to transmit data between the mobile device and the cloud.

Figure 2. Benefits of Edge computing
(Courtesy: Intel & Moniem-Tech).

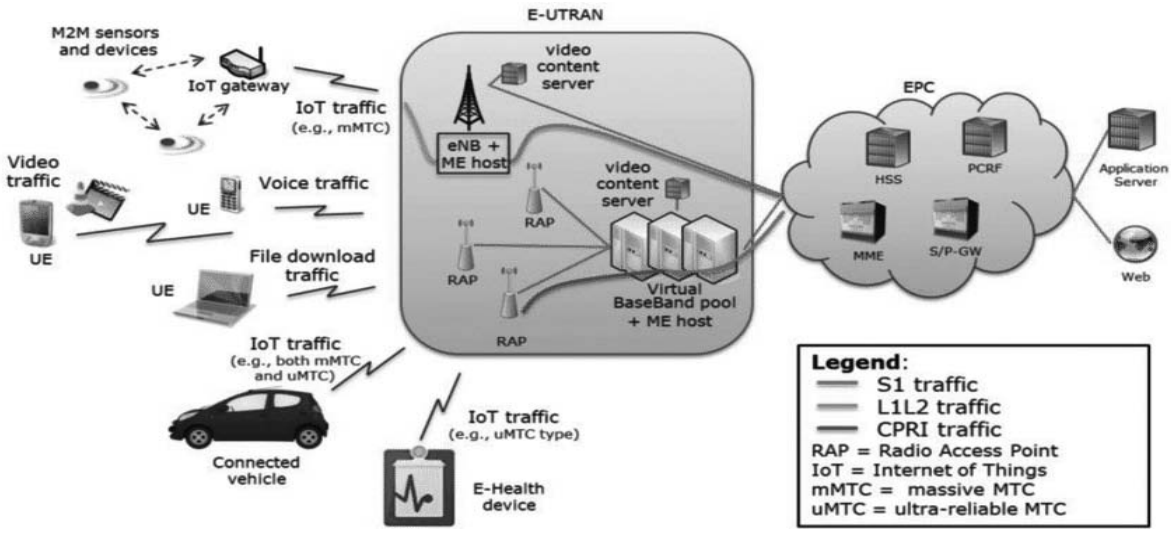

Figure 1. Introduction to Mobile Edge Computing (MEC).

III. MEC BENEFITS

MEC offers a range of benefits for 5G networks, including reduced latency, increased security, and improved network performance. The following are some of the key benefits of MEC:

**Reduced Latency*: MEC enables computation and storage resources to be located closer to mobile users, reducing the time taken to transmit data between the mobile device and the cloud. This reduces latency and improves the user experience for low-latency services such as virtual reality and augmented reality.

**Increased Security*: MEC enhances security by processing sensitive data closer to the source. This reduces the risk of data breaches during transmission and improves the overall security of the network.

**Improved Network Performance*: MEC improves network performance by reducing the load on the core network. This results in faster data transmission and reduced network congestion.

IV. MEC USAGE IN 5G NETWORKS

MEC is becoming increasingly important in the era of 5G networks. 5G networks require low-latency services such as virtual reality, augmented reality, and autonomous vehicles, which cannot be delivered efficiently using traditional cloud computing methods. MEC enables these services by reducing the time taken to transmit data between the mobile device and the cloud. MEC can also be used for other services such as video analytics, unified communication, and gaming.

V. TECHNICAL SPECIFICATIONS AND STANDARDS

MEC deployment requires a range of technical specifications and standards to be set. 3GPP has played a significant role in developing these standards. 3GPP has defined the architecture for MEC in its Technical Specification TS 23.501. The specification defines the functional requirements, interfaces, and protocols for MEC, enabling interoperability between different vendors and operators.

The key components of the MEC architecture defined by 3GPP include:

MEC Platform: The MEC platform provides computation and storage resources at the edge of the network. The platform includes a MEC host, which provides an execution environment for MEC applications.

MEC Applications: MEC applications are software programs that run on the MEC platform. MEC applications can be developed by third-party developers and can be tailored to meet specific service requirements.

MEC Services: MEC services are the services provided by MEC applications. MEC services can be used by mobile users or other applications in the network.

MEC Platform manager/System Management:

MEC system management is responsible for managing the MEC platform, MEC applications, and MEC services. MEC system management includes tasks such as deployment, configuration, and monitoring.

VI. THE WAY FORWARD

MEC deployment is expected to grow rapidly in the coming years. According to a report by Markets and Markets, the global MEC market is expected to grow from $127.5 million in 2017 to $838.6 million by 2022. This growth is driven by the increasing demand for low-latency services and the need for efficient network management.

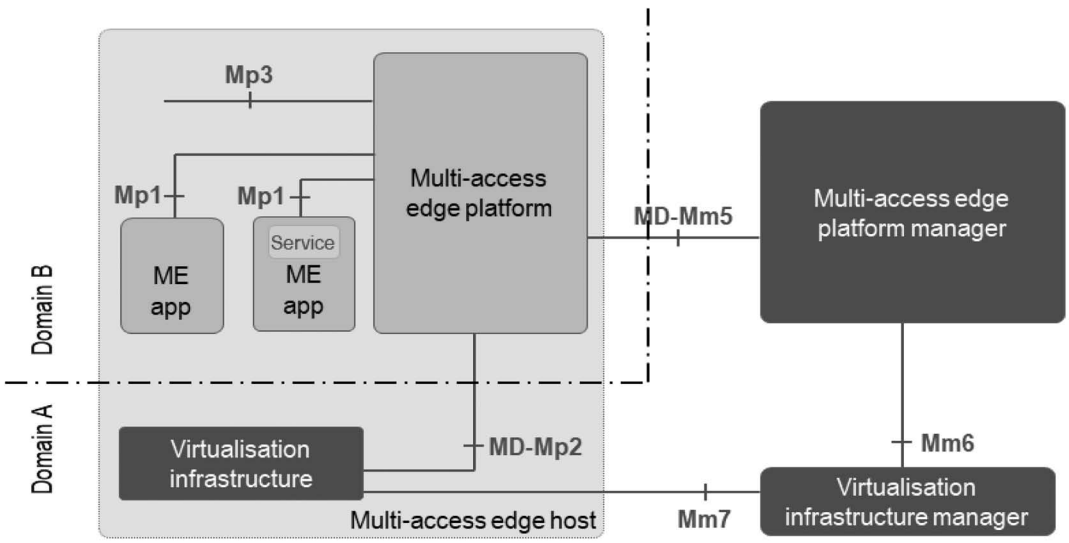

Figure 3. Architecture of MEC.

VII. PROFESSIONAL HELP

MEC deployment requires professional help to ensure that the technology is implemented correctly. This includes network planning, deployment, and management. Professional services can help operators to identify the best deployment models for MEC, considering factors such as network topology, user density, and service requirements.

VIII. CONCLUSION

MEC is an emerging technology that offers a range of benefits for 5G networks. MEC enables computation and storage resources to be located closer to mobile users, reducing latency and improving network performance. MEC deployment requires a range of technical specifications and standards, which have been defined by 3GPP. Professional help is required to ensure that MEC is deployed correctly and efficiently.

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Honey Charnalia is Senior 5GNR/LTE/VoLTE Expert (Multivendor : Nokia, ZTE, Huawei and Ericsson) with involvement in 5G(NR), LTE, VoLTE responsible for Optimization and Planning of LTE (FDD/TDD) networks, he has extensive LTE E2E testing including (PS core/Radio), RNO/RNP experience in technical analysis, Radio Access Network (RAN) Design, Dimensioning and optimization of Wireless Networks. Supported more than 10 large scale LTE Rollouts and 20+ LTE bid Trials (showcase Vendor capabilities). Have Excellent written, verbal, interpersonal, and leadership skills. Ability to asses, organizes, and prioritizes complex situations.

Possesses over 15 years of rich industry experience across Radio Network Planning and Optimization on 5G/VoLTE/LTE/UMTS/GSM technologies of Nokia and ZTE, Huawei systems. He demonstrated excellent communication and relationship management skills with the ability to lead and work in cross-functional teams in a cross-cultural environment.
He conducted training workshops for clients and in-house team members all across the globe of over 50 countries. Possesses major expertise on Nokia, ZTE and Huawei latest equipment.

Worked globally with Sprint USA, AT&T USA, Nokia Japan, Nokia USA, MTN Nigeria, Ooredoo Myanmar, Clario South America, MBNL UK, E-Value Serve Global, Airtel PAN India and many more.