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AN OVERVIEW OF MOBILE EDGE COMPUTING

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Abstract: Mobile Edge Computing (MEC) provides mobile and also cloud computing capabilities within the access network, this aims to unite the Telco and IT at the mobile network edge. The main feature of MEC is to push mobile computing, network control and storage to the network edges so as to enable computation- intensive and latency-critical application at the resource-limited mobile devices. MEC promises dramatic reduction in latency and mobile energy consumption and helping in tackling the key challenges for materializing 5G vision. As a profitable edge technology, it can be applied to mobile, wireless, and wire line scenarios, by using a software and hardware platforms, located at the network edge. Mobile Edge Computing provides seamless integration of multiple application service providers and vendors toward mobile subscribers, enterprises, and some other vertical segments. MEC is an important component in the 5G architecture which supports variety of innovative application and services where ultra low latency is required. The aim of this paper is to present a comprehensive survey of relevant research and technological developments in the region of MEC.

Keywords: Binary offloading, Autonomous mobile robots (AMRS), Dense Geographical Distribution, Augmented Reality and Virtual Reality (AR/VR), Ultra authentic low latency communication, Virtualization infrastructure Manager.

I. INTRODUCTION

Mobile Edge Computing (MEC) is emerging as very optimistic computation architecture by pushing computation and storage closer to end users with both strategically deployed and delicate processing and storage resources. Such mechanism is essentially divergent from the traditional cloud computing. MEC aims to enable millions of connected mobile devices to carry outthe real-time application directly at the network edge. The discriminate features of MEC are its closeness to end users, mobility support, and dense geographical deployment of the MEC servers.

MEC special issue aims at presenting the current state-of- the-art research and future trends on various outlooks of mobile edge computing techniques for cloud based IOT application and attempts to build highly adaptive smart environments that can automatically adapt behaviors to the amount of available resources. The main region covered by this special issue or main topics cover methodologies, modeling, analysis, and newly established applications.

II. MEC OVERVIEW

MEC is proposed to reduce the latency and power consumption of mobile devices, by allowing them to offload their computation-intensive tasks to servers in proximity. In MEC, there are two kinds of resources, namely the communication and computational resources. The communication resources in MEC are same as those in traditional wireless communication systems, and can be classified by space, time, and frequency domains. The computational system performance, a joint allocation of communication and computational resources is often needed. Some of the existing works on MEC consider remote computing only i.e., all users discharge their computing tasks to the MEC server. Others also insert the option of local processing.

There exist two kinds of such schemes:1) Binary offloading 2) partial offloading. Gaming request work in a near way. The riot of cloud based gaming and its related hardware has circulate video games apart from the traditional comfort experience: local hardware, local software. Gamers can now access their special games together with data heavy alluring adventure, on narrow clients with little to no intermission. Autonomous vehicles and robots: beginning technologies like self- driving cars and autonomous mobile robots (AMRs) require powerful machine learning to make conclusion rapidly. If those conclusions occur in a distant data processing center, seconds could be the distinction between escape potential accident or barrier and spiral disaster. With conclusion occurrence physically close by in real time, a car can associate people, animals, and traffic in its path and cross around them. Likewise, AMRs can still complete their tasks in spite of environmental or employee disturbance, helping minimize downtime and maintain fertility.

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The occurring deployment of 5G networks: As the next causing of a global wireless standard, 5G and the revolution that stock from it will depend on MEC to connect machines, objects, devices, and people all over. One of the primary dispose points of extensive 5G networks is as its high bandwidth, ultra authentic low latency communication (URLLC), making MEC a virtually indivisible part of the discussion. The applications for 5G are as differing as MEC by definition, efficient of not only customer facing technology like video games and enjoyment, but also assignment critical operations in education, agriculture, carrying logistics, and healthcare—areas where break second action is the varied between success and failure, or even life and death.

The attractiveness of 5G connectivity expands to country regions and other inappropriate areas, where internet access is not always strong or accessible. Manufacturing high speed internet access a reliable, agreeing reality in these parts of world can create better chances for health care and education. Slightly than driving hours for even basic care, people can use the internet to get the treatment they require, whether that's primary supervision or mental health assets. With 5G, students also pay access to learning materials they require to excel in the classroom, as was the case during the widespread when classrooms convey to at home learning. Mobile Edge Computing can be categorized by the Successive properties:

1) Proximity:

In Mobile Edge Computing, edge network is accessed by the mobile devices using Radio Access Network (RAN). Mobile or portable devices can also connect to the nearby devices through device-to- device (D2D) communication and concurrently mobile devices can access edge server located at the mobile base station. Since, edge server is nearby to devices; it can extract device information and analyze user's behavior to improve services.

2) Dense Geographical Distribution:

Mobile Edge Computing host IT and cloud computing services at the edge network which sits at numerous locations. Dense geographical dispersed infrastructure contributes in many ways. Services can be provided based on user mobility without traversing the entire Wide Area Network (WAN).

3) Low Latency:

One of the goals of Mobile Edge Computing is to reduce latency when accessing the core cloud. In Mobile Edge Computing, programs are hosted on the Mobile Edge sever or cloud positioned at the threshold network. Since, the available bandwidth within the edge network is high when compare to the core network, average network latency is reduced.

Edge computing can faster, more solid services at a lower cost. For users, edge computing means a faster, more agreeing experience. For endeavor and service providers, edge means low- latency, highly available apps with real-time monitoring.

- Edge computing can reduce network costs, avoid bandwidth constraints, reduce passing on delays, limit service defeat, and provide better control over the movement of sensitive data. Load times are cut and online services locate closer to users enable both dynamic and static caching capabilities.
- Applications that benefit from lower response time, such as increase reality and virtual reality applications, satisfaction from computing at the edge.
- Other benefits of edge computing insert ability to conduct on-site big data analytics and collection, which is Allows for near real-time conclusion making. Edge computing further reduces the risk of reveal sensitive data by keeping that entire computing power local, and then allowing companies to implement security practices or meet managing policies.
- Enterprise customers benefit from the flexibility and costs related with edge computing. By keeping computing power local, regional sites can continue to operate independently from a core site, even if something ideal the basic site to stop operating. The cost of paying for band width to take data back that compute Processing power closer to its source.

An edge platform can help supply consistency of operations and app development. It should support interaction toaccount for a greater mix of hardware and software environments, as against to a computing centre's. A virtual edge plan allows products from multiple traders to work together in an open ecosystem.

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III. CONCLUSION

In this paper, we present a framework which leverages MEC to support diverse applications in smart city scenarios. To always ensure high QoE, the "follow me edge" concept is introduced. According to this concept, services move across edge servers as per the movement of its respective users. The proposed framework is validated using a real-life test bed. Edge mobility was tested using different storage types, different container sizes and different edge resources. Interesting results were obtained suggesting the migration latency depends on different used techniques. The obtained results also demonstrate that short migration latency does not necessarily guarantee high QoE. It becomes apparent that the complexity of the system arises as a tradeoff between short migration latency at the cost of possible data loss. Based on the obtained results, it can be concluded that a mechanism to select the right combination of techniques to be used for efficiently migrating a service is of vital importance. This defines one of the author's future research directions in this area.

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