

An Exploration of LTE Characterization for Handoff Process

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ABSTRACT:

LTE network is one of the foremost 4G technology applied for WLAN communication and for mobile communication. This model is effective to provide significant and uninterrupted communication in case of video and voice. The criticality of the network increases during the mobility. In this paper, an exploration to the LTE architecture is defined along with associated issues and challenges. The paper has presented the LTE characterization for handoff process. The paper has identified the strengths of the network along with property exploration so that the significant network communication can be applied.

KEYWORDS: LTE, Handoff, Characterization, Mobility, Architecture

INTRODUCTION:

LTE(Long Term Evolution) is the 4G technology defined to provide high speed communication for video and other highly adaptive features. This communication model is also defined under mobile and the telecommunication system so that the communication performance improvised. This network architecture is defined with the specification of packet data optimization and cost effective analysis with efficient air interfacing. The connectivity analysis is here obtained under to gain the switching between different communication networks. The voice connectivity is achieved by VoIP protocol for packet formation based communication. This communication model is also combined with different communication standards including the GSM and WCDMA.

This communication model provided uninterrupted and stable communication for static networks but as the mobility is included in the network. The network model is also defined under the technological specification so that the distinctive communication will be formed under the specification of connection services so that more reliable and accurate communication will be formed. Author defined the mobility driven communication is required that can provide seam less communication. LTE is able to provide the strength communication for mobility based nodes in Terrestrial radio network with specification of geographical areas. The deployment architecture and the features of LTE network is given in this section.

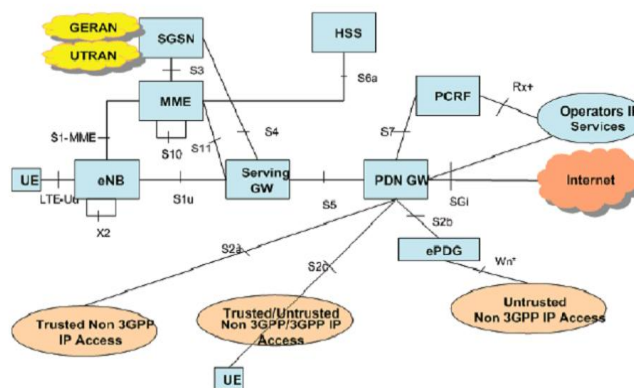


Figure 1: LTE Architecture

A) LTE DEPLOYMENT:

The LTE network deployment is applied in the network to obtain the maximum data usage. The data rate adaptive communication also reduces the communication delay and achieves the effective communication with radio spectrum specification. This kind of network model is defined with technological specification so that the network maintenance cost will be reduced. This network model also resolves associated network issues so that the traffic monitoring and the communication modeling will be achieved. This deployment model resolves the associated issues under price modeling and the market adoption to the network. The feature based legacy system setup under 3G technology is defined to explore the concept and features. The CDMA based system is defined with downlink modeling so that the spectral properties exploration and the bandwidth scalability is achieved. The network model is also able to reduce the PAPR on transmitter side and provide the complexity and power consumption based optimization under critical vector. The downlink optimization scheme is presented under spectral density analysis so that the optimized communication will be formed. LTE provides the paired communication on different bands so that the optimized communication is formed. Air interface based architectural specification is here adopted to achieve high communication rate and lower latency to optimize the communication. The network model also provided the seamless interoperability for legacy system. The basic architecture of the system is shown in figure 1. Figure is showing the high level architecture with specification of system component, network elements and interworking elements so that the radio service analysis can be formed. The communication modeling here includes the packet radio service based enhancement for terrestrial communication in the network.

In this paper, handoff in LTE network is explored. The paper has discussed the significance of LTE communication network under associated challenges. The paper also presented the characterization of handoff in this network form. In this section, an exploration to LTE network and mobile network is provided along with associated issues. The section also presented the communication and architectural specification of LTE network. In section II, the work defined by earlier researchers for handover processing in different networks is defined. In section III, the LTE characterization for handoff process is explored. In section IV, the conclusion obtained from the work is presented.

EXISTING WORK:

In this section, the work defined by earlier researchers on different kind of handover process is defined on different network. Author identified the various network issues along with the cluster switching model. The paper also identified the issues associated to optimize the communication. Some of the contributions of earlier researchers is discussed in this section. Wonjun Lee[1] presented a work on vertical handoff process applied for WLAN network. Author defined the work under WiMAX communication and provided the movement aware communication analysis applied to perform the mobile communication handover for WLAN system. The work is here defined to obtain the movement pattern analysis applied in an integrated form so that the communication performance will be improved. Author defined the irregularity analysis to optimize the handoff process. Malak Zareif Habeib[2] has presented a work WiMax and WLAN based communication system to perform the handover triggering under different technological specification. The battery status analysis and the communication access analysis is here applied to analyze the terminal capabilities. Once the capabilities are observed, the smooth handover is performed between the nodes. Jaeho Jo[3] presented a cross layer communication mechanism for WiMAX and 3G network. Author defined the cross layer optimization under communication vector so that the layered optimization will be achieved from the work. Author defined the handover switching between sub networks so that the performance optimization between the different network forms will be achieved. Author analyzed the throughput and communication loss as the optimization vectors.

Yu-Chang Chen[4] has provided a work on vertical handoff architecture under hybrid communication analysis with heterogeneous features that guarantees the QoS. Author applied the architecture specific communication under the QoS strength analysis so that the communication mechanism can be improved under bandwidth browsing and QoS mapping. Author provided the vertical handoff adaptive communication

with protocol specification so that the communication goals will be achieved from the work. Z. Dai[5] has provided a work on vertical handoff under MAC protocol specification for hybrid network. Author defined the connection driven triggering to optimize the communication and improving the QoS. Author provided the technological specification based analysis to optimize the network communication and improving the communication strength for network. Zhiwei Yan[6] has defined a work on multiple criteria specification model under vertical communication analysis and framework adaptive communication modeling. Author provided the handoff triggering so that adaptive communication will be formed.

Pravin Pawar[7] has presented a context driven communication architecture to optimize the vertical handover. Author provided the multi homed nomadic mobile communication mechanism under vertical handover so that the hosted communication will be formed over the network. Author defined the feature adaptive network model to optimize the communication under delay optimization model and provided the QoS optimization so that the effective network estimation will be done. Tae-sub Kim[8] has provided a work on hybrid vertical communication model for LTE and WLAN methods to optimize the resource management under generic link layer optimization. Author generated the communication model under vertical handover and provided the seamless communication. Johann Márquez-Barja[8] has provided the context analysis criteria for selection of the base station under the network condition analysis. Author defined the optimization model of 802.21 and provided the context driven analysis applied to optimize the communication. Zhiwei Yan[9] has provided a dual threshold based vertical handover model for handover optimization with authentication mechanism. Author provided the media specific handover so that the fast handoff process will be obtained with node verification. Seyed Vahid Azhari[10] provided a problem analysis model for WLAN communication optimization under vertical handoff. Author achieved the bandwidth reservation modeling along with the specification of communication architecture to optimize the communication and decreased the node blockage.

R. Good[11] has presented a work on multi layered communication architecture to optimize the handover under 802.11. Author defined a study on routing protocol, mobility analysis and the session formation modeling. Author defined the architectural constraints so that the evaluation with the communication ability will be improved. Gracieth Valenzuela[12] has provided a work on quality analysis to provided the traffic load based communication so that the overall network optimization will be achieved. Author defined the evaluation model for communication quality analysis so that the optimized communication will be formed. Author defined media adaptive handover to optimize the communication traffic.

HANDOFF CHARACTERIZATION FOR LTE:

LTE network as discussed earlier is one of the significant network form applied in limited area network such as WLAN or mobile network communication to achieve high speed communication. This network form is responsible to provide the effective and reliable communication in terms of interrupted communication form. This communication form optimization is also required during the handoff process. The handoff is one of the critical communication challenge occur when a mobile node comes outside its coverage range. As the coverage range of the network is changed, the multiple base stations or the service providers can take the control of the node. In such case, there is requirement to elect the most effective base station for the node. The mobile station in such network is required to adapt the new links without disrupting the earlier communication. According to this the handoff can be hard handoff or soft handoff. In case of hard handoff, at first the existing communication link break and then a new communication link is established. While performing the video communication such kind of handoff is not required. In second handoff form, at first the new communication link is generated and then the existing link breaks. This handoff form is provided by LTE network to maintain the video communication during the handoff process. The seam less handoff is achieved by the communication architecture. The handoff process is applied in three main stages shown in figure 2.

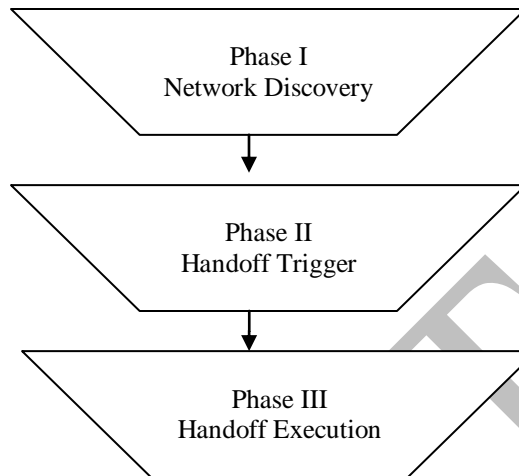


Figure 2 : LTE Handoff Model

A).PHASE I

As the network is established through multiple infrastructure devices defined as the LTE controller. Each mobile node is controlled by the specific controller device. As the node moves outside the coverage of its current controller, the node search for the network for the neighboring or the accepted nodes in the same sensing range. To obtain the list of available controllers, the service request is broadcasted. The controllers that accept this request are considered as the possible controller available in the same range. This process of locating the node itself or to identify the list of available service providers is called network discovery model. During this phase, the features of the various controllers are also captured by the mobile node.

B)Phase II

As the identification of the possible controllers in the range is done, the next work is to perform handoff triggering. This decision is parameter based and the target network specification based parameter analysis is done. Different controllers are analyzed in terms of different parameters including the static and dynamic parameters. The parameter detail is captured in this stage so that the triggering can be done. The decision parameter includes bandwidth, load, transmission rate etc. Once the parameter values is obtained, the comparative analysis is performed to provide the adaptive handoff. The destination controller is obtained based on this prior analysis.

C)Phase III

In final phase of this model, the actual handoff process is performed. This handoff requires ending the last communication session with current controller and starting the new session with new controller node. The information also need to transfer such as the routing information, contextual information etc. The route updation is required to keep maintaining the last information or communication uninterruptedly. Once all the parameters are defined, the handoff is performed.

CONCLUSION:

In this paper, an exploration is provided for the handoff process in LTE network. The paper has identified the significance of LTE network to optimize the WLAN communication. This paper also identified the associated network challenges and explored the handoff process for the network formation.

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