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Gateway Relocation and Admission Control In 4g+

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Abstract: 4G, short for the fourth generation, which is the current technology is going to lead the mobile telecommunications technology. A 4G system is used to define the service which leads to minimize the packet loss and handover delay. A Base Station(BS) that covers 100Meters of distance, then the handoff will occur normally after 90Meters. In this case, the Mobile Station (MS) will receive the poor signal & hence there are possibilities of Data packet loss. In our proposed system, we are introducing the handoff before 75M instead of 90M, and hence reducing the packet loss thereby maintaining the signal strength stable during the handoff.

I. INTRODUCTION

Mobile computing is taking a computer and all necessary files and software out into the field. Mobile computing is any type of computing, which use the internet or intranet and respective communications links, as WAN, LAN, WLAN, etc. mobile computers may form a wireless personal network or a piconet. It is a human-computer interaction by which a computer is expected to be transported during normal usage.

The Fourth generation mobile network is a promising network for upcoming days. It will suitable for both voice over communication and internet access.Different base stations deployed for serving the network. When nodes entered new BS previous BS will hand over the data to current BS Continuously handoff scheme will happen while mobile station is moving. But In handoff there is a chance to lose some amount of packet, when handover one BS to different BS this is a drawback .So we propose a better hand off scheme in 4G. In our proposed method STAs will choose the BS based on the signal strength of the BS and the velocity of the node movement. Each BSs propagates its coverage range, initially we set one threshold value for better hand off. When the node crosses the threshold value, it will scan the best BS for hand off. Threshold value generated by signal strength of the BSs. After select the BS, it will hand off to the corresponding BS. Here we also considered the speed of the nodes, base station selection will be consider by both signal strength and moving speed of the nodes. Base stations are stable and mobile stations are not stable. Base stations send and receive the packets in terms of signals.

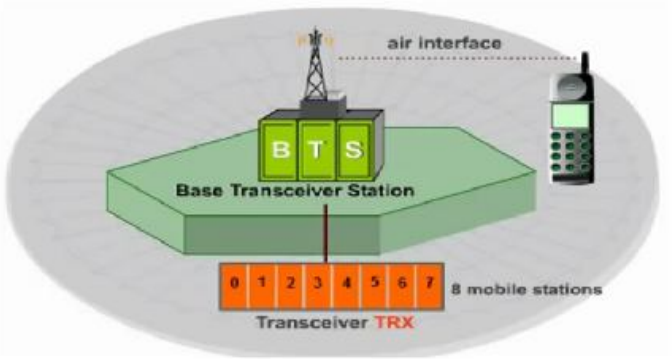


Figure1:Mobile Communication Over Air Traffic

In this figure we having eight different mobile stations (0 to 7) mobile signals are travelling on air interface from Base Transceiver Station (BTS. Initially mobile signals are travels from Gateway to the Base Station(BS) And Base Station(BS) to Mobile Station(MS).

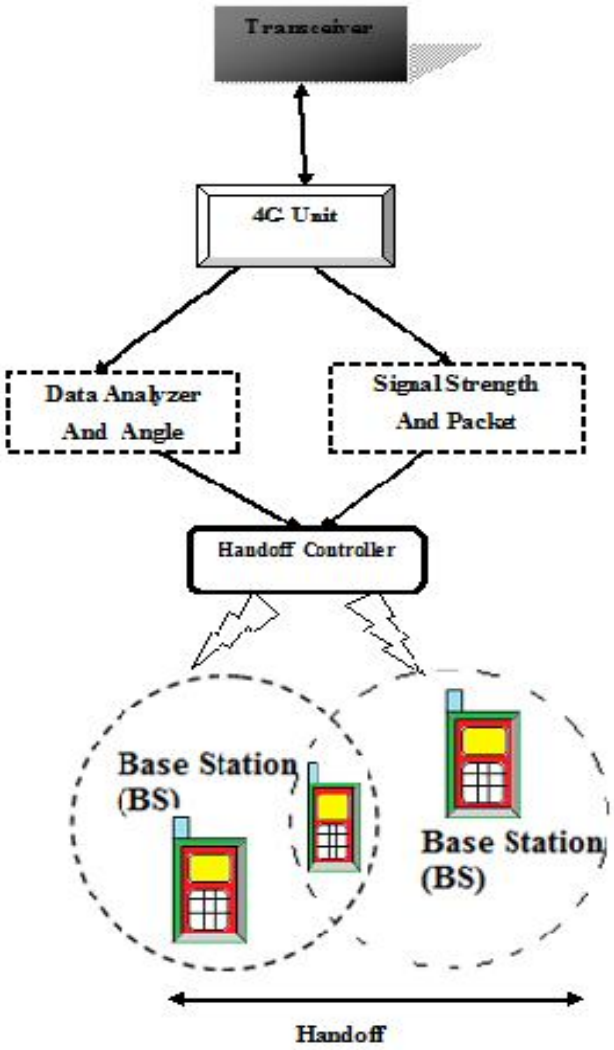
II. SYSTEM ORGANIZATION

Main scope of this paper is solving the handoff problem in 4G. Handoff packet loss is the major issue in mobile communication. Our

ultimate aim is solving gateway relocation in 4G.The Handoff schemes should be seamless then only we can serve better service. Here we are going to solve the problems in closely-spaced 4G. The major causes in 4G is wide area networks are so many users trying to use same access point, interferences from nearby 4G. The better hand off scheme algorithm based on signal strength of the nodes. It resolves the interference problems between 4G.

Transceivers are used to send or to receive the signals from sender to receiver or from receiver to sender. It transmits the signals in the terms of the new generation 4G. this 4 generations are transmit and receive the signals by analysing the two things, one is distance and another one is signal strength. These things are analysed by using distance analyser and signal strength analyser. Finally this base transceiver stations are used to control the handoff to the corresponding mobility stations.

Threshold values are set by the user to create the handoff. The main goal to creating the handoff is to reduce the packet losing and to increase the speed of the network. Signal strength is analysed for both network and acceptability of the mobility node. Base stations are used to cover the mobile station within a particular region of its signal. Each and every base station will covers a particular space region depends on the signal strength of every base station.



III. BASE TRANSCEIVER STATION

It is a wireless communication between user equipment and network. User equipments are devices like mobile phones, computer with wireless internet connectivity. Though the term BTS can be applicable to any of the wireless communication standards, it is generally

associated with mobile communication technology like GSM and CDMA. In this regard, a BTS forms part of the base station subsystem development for system management. It may also have equipment for encrypting and decrypting communications.

IV. BASE STATION

Base station is a GPS receiver at an accurately-known fixed location which is used to derive correction information for nearby portable GPS receivers. This correction on data allows propagation. Finally it gives greatly increased location precision and accuracy over the results obtained by uncorrected GPS receivers.

V. MOBILE STATION

A mobile station (MS) comprises all user equipment and software needed for communication with a mobile network. The term refers to the global system connected to the mobile network, i.e. a mobile phone or mobile computer connected using a mobile broadband adapter. This is the terminology of 2G systems like GSM. In 4G systems, a mobile station (MS) is now referred to as user equipment (UE).

A. In GSM, a mobile station consists of four main components

1) *Mobile termination (MT)* - offers common functions of a such as: radio Transmission and handover, speech encoding and decoding, Error detection and correction, signaling and access to the SIM. The IMEI code is attached to the MT. It is equivalent to the network termination of an ISDN access.
2) *Terminal equipment (TE)* - is any device connected to the MS offering services to the user. It does not contain any functions specific to GSM.
3) *Terminal adapter (TA)* - Provides access to the MT as if it was an ISDN network termination with extended capabilities. Communication between the TE and MT over the TA takes place using AT commands.
4) *Subscriber identity module (SIM)* - is a removable card that contains subscriber identification token storing the IMSI. It is unique key shared with the mobile network operator and other data.

VI. HANDOFF / HANDOVER

In cellular telecommunications, the term handover or handoff refers to the process of transferring an ongoing call or data session from one channel connected to the core network to another channel. In satellite communications it is the process of transferring satellite control responsibility from one earth station to another without loss or interruption of service.

A hard handover is one in which the channel in the source cell is released and only then the channel in the target cell is engaged. Thus the connection to the source is broken before or as' the connection to the target is made—for this reason such handovers are also known as break-before-make. Hard handovers are intended to be instantaneous in order to minimize the disruption to the call. A hard handover is done explicitly by network engineers as a separate process during the call. It requires the least processing by the network providing service. When the mobile is between base stations, then the mobile can switch with any of the base stations, so the base stations bounce the link with the mobile back and forth. This is called ping-ponging.

A soft handover is one in which the channel in the source cell is retained and used for a while in parallel with the channel in the target cell. In this case the connection to the target is established before the connection to the source is broken, hence this handover is called make-before-break. The interval, during which the two connections are used in parallel, may be brief or substantial. For this reason the soft handover is perceived by network engineers as a state of the call, rather than a brief event. Soft handover may involve using connections to more than two cells: connections to three, four or more cells can be maintained by one phone at the same time. When a call is in a state of soft handover, the signal of the best of all used channels can be used for the call at a given moment or all the signals can be combined to produce a clearer copy of the signal. The latter is more advantageous, and when such combining is performed both in the downlink (forward link) and the uplink (reverse link) the handover is termed as softer. Softer handovers are possible when the cells involved in the handovers have a single cell site.

VII. NETWORK CREATION

In network creation, if nodes want to access the network, it will send request message to Base Station. Which one is near to the

particular access point, it will send response message to node. Creating mobile nodes and different Base station. Nodes will placed within the range of Base station.

The mobile equipment can able to send request message to the nearer base station and that corresponding base station will send the request message to that particular mobile node. Here we use UDP protocols so we does not have any acknowledgement but while using TCP it sends message to the destination and also get an acknowledgement from thdestination. This is the main different between UDP and TCP.

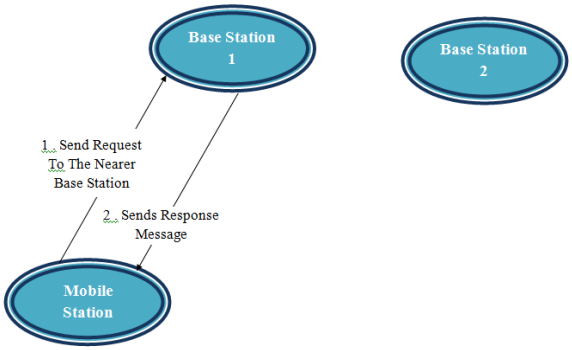


Figure2: Network Creation

VIII. BASE STATION SELECTION

Network will be select by coverage area of the Base Station. Base Station will serve the node. All the nodes are mobile nodes, nodes can roaming the network freely.

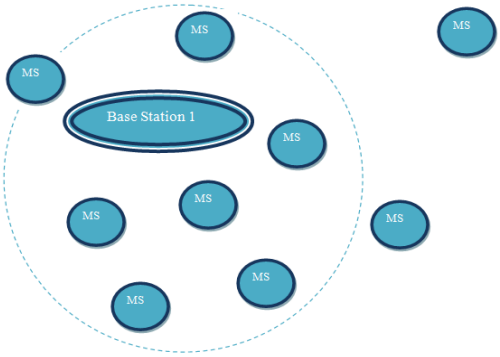


Figure3: Base Station Selection

IX. HANDOFF SCHEME

When nodes enter different BASE STATIONs area, previous BASE STATION will hand over the node to current BASE STATIONs. In this scheme BASE STATION will handoff when the node cross the certain range of coverage.

The range will set based on the signal strength of the base stations. So it can provide less data loss in handoff scheme. The 4G signals are transmit or to receive the signals from the mobile node through the Base Station . It check the mobile nodes current position and checks the signal strength of the network to create a handoff using threshold value.

X. PERFORMANCE MEASURE

In First generation network we use signal in analogy format and we also have the component to covert the signal from analogy to digital signal conversion. It take some time to convert the signal from both sender and receiver side, so it also consider as a delay. In second generation network we use only a digital signals, but it also have some of the packet loss and time delay, so we moves to the

third generation networks. In a third generation network we speed up our mobile network, but it is able to convert the data's in terms of KBs only i.e. maximum 1 MB per second and it also have packet losses so we moves into the fourth generation technique. In a fourth generation network it able to transceiver up to 1TB of packets within one second, but it also have some possibility to loss the packets.

In our proposed system we are going to reduce the packet losses and reduce the network signal delay's. Here I produce two graph for normal fourth generation and developed projects graph. The graph named packet delivery factor and packet drop.

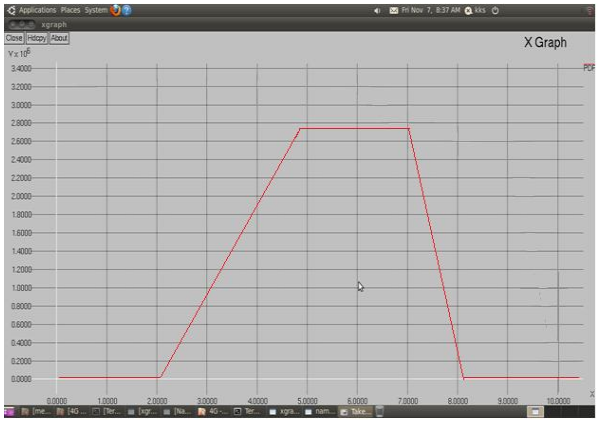


Fig 4 PDF graph for 4G

In a previous packet delivery factor graph, X axis denotes as time and Y axis denote the number of packets. In a graph, from starting time to 2 minutes of time the mobility station does not have the signal, while performing handoff. After two it slow up its signal and it will get the stable signal at the point of 5 and maintain that signal until it reaches the time eight, in between this the mobility station will send or receive the packets it shows in a PDF graph. After eight it does not have any signal to transceiver the packets. But here we set ten as a terminate time; signals are terminated at the time of eight.

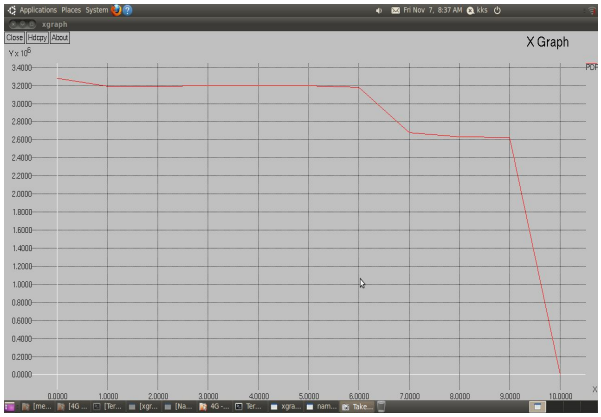


Fig 4. PDF graph for gateway relocation and admission control in 4G

In this packet delivery graph, we get the uplink signal at the time of starting and it terminates only at the time of termination. Here I fix its termination time as ten, it terminates at the time of ten only. From starting to sixth minute of time my signal strength is stable after six it drop some packets and get slow till the signal reaches the time of nine. After this my signal strength will get week and get slower, after crossing ninth my signal will get quit.

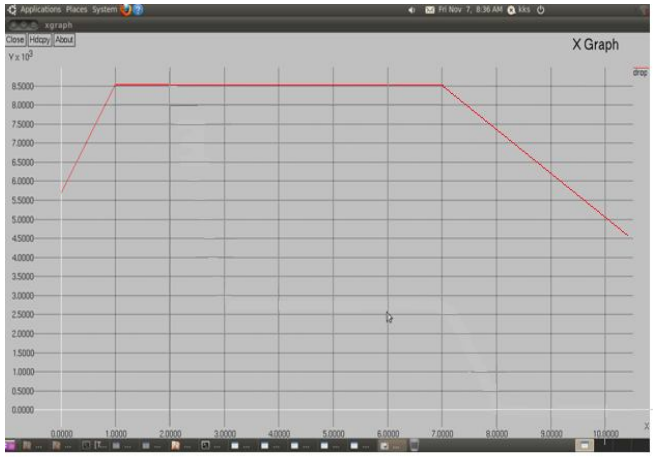


Fig 5. Packet Drop graph for 4G

In this packet drop graph, X axis is considered as a time and Y axis as consider as a number of packets will be dropped. From initial position we do not have any drops after that from one to seven minutes we have packet losses. After seven to ten we can see the packet drop, this packets drop is reduced.

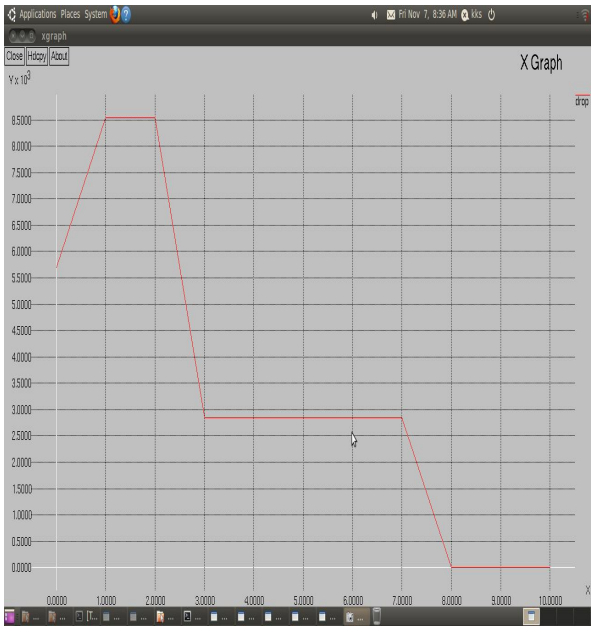


Fig 6. Packet Drop graph for gateway relocation and admission control in 4G

XI. CONCLUSION

In this work, we propose a better hand off scheme in 4G. In our proposed method STAs will choose the BS based on the signal strength of the BS and velocity of the node movement. Each BSs propagates its coverage range, initially we set one threshold value for better hand off. When the node crosses the threshold value, it will scan the best BS for hand off. Threshold value generated by signal strength of the BSs. After select the BS, it will hand off to the corresponding BS. Base station selection will be considered by both signal strength and moving speed of the nodes. Here we are going to create a handoff before the hand off region. By creating a handoff we can able to get constant signal strength, due to this the data rate will be increase and the packet transition time will be increase.

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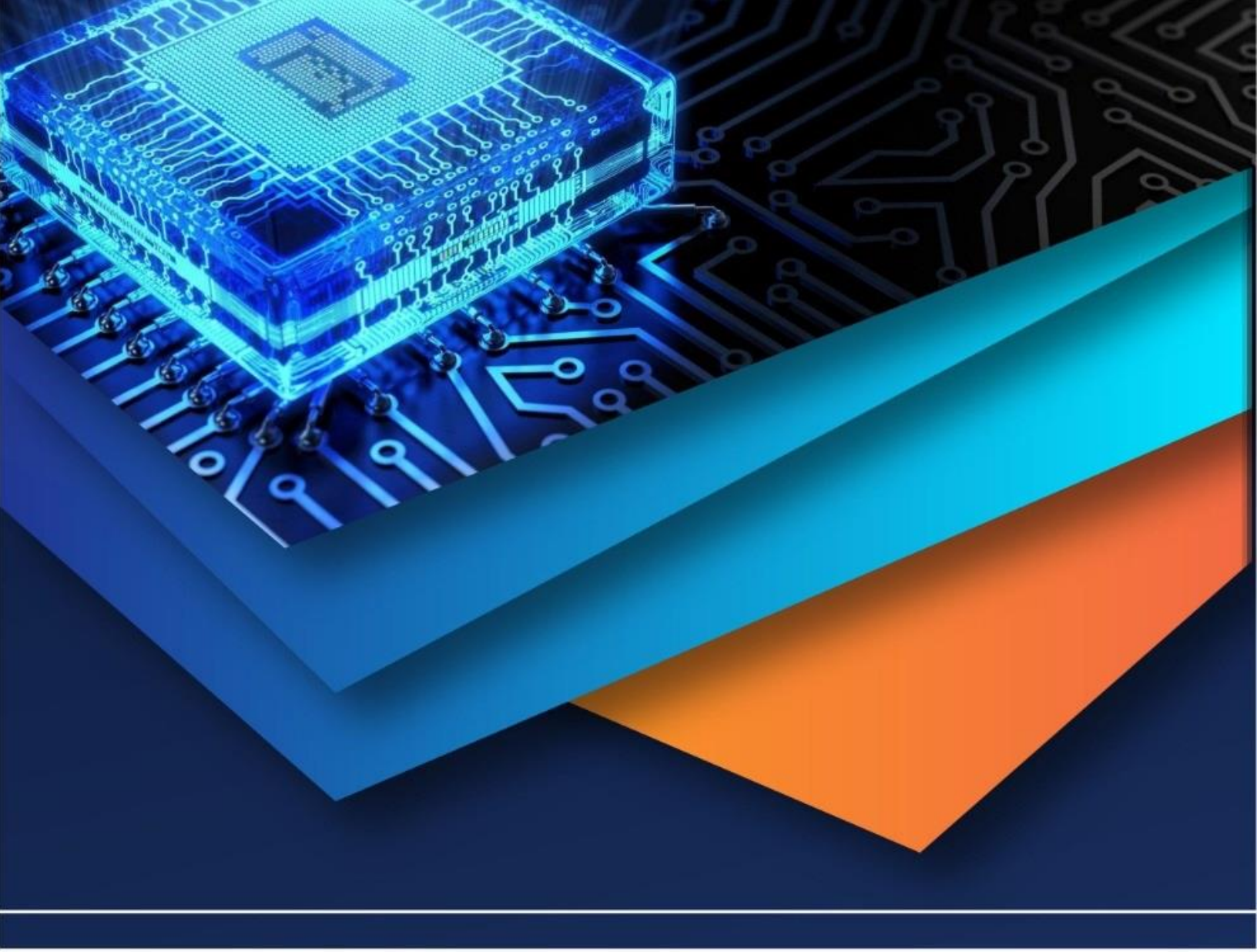

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