# Enhanced Handovers and Secured Authentication Systems

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**Abstract:** Wireless communication is a medium to transfer data from one place to another without any physical medium. Due to heavy network traffic handover should take place but fast handovers are taking place. Also there is a lot of chance for unauthorized users to access the data and connection which lack in security. Security is one of the major problems faced in day-to-day lives. There are many hosting stations in that we are generating a routing (i.e., source and destination). We will reach the destination from the source by finding the shortest path of the station. If the attack takes place the transmission and the processing will not occur. So we ensure maximum security that only authorized users can access the connection and the data.To provide more security in the wireless communication platform, cryptographic technique is followed.

**Keywords:** Traffic, handovers, security.

## 1. Introduction

### 1.1Domain Introduction:

Wireless communication is a communication in which ,transmitting information is done using without any connections like wires, cables or any physical medium from one point to another. It propagates the signal through space. Since, space only allows for signal transmission without any guidance, the medium used in Wireless Communication is called Unguided Medium.

In wireless communication, the transmission and reception of signals is accomplished with Antennas.Antennas are electrical devices that transform the electrical signals to radio signals in the form of Electromagnetic (EM) Waves and vice versa. These Electromagnetic Waves propagates through space. Hence, both transmitter and receiver consist of an antenna.

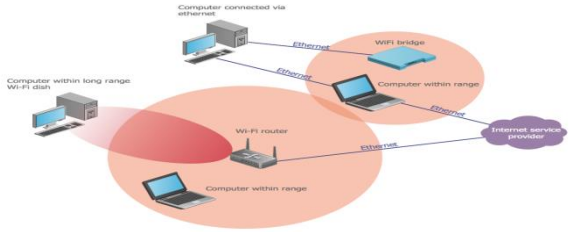


**Fig. 1 Wireless Communications**

### 1.2 Domain Architecture:

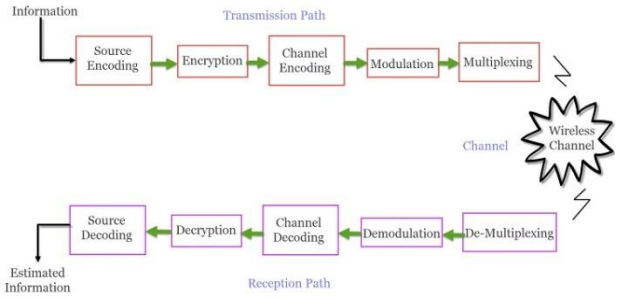

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**Fig.2 Block Diagram of Wireless Communication**

## 2. Related Works:

Recently, we have seen a boom attempts to improve the operation of networking protocols using machine learning (ML) techniques. The proposed reinforcement learning (RL) based control solutions very often overtake traditionally designed ones in terms of performance and efficiency. This paper presents the ns3-gym — the first framework for RL research in networking. It is based on OpenAI Gym, a toolkit for RL research and ns-3 network simulator. Specifically, it allows representing an ns-3 simulation as an environment in Gym framework and exposing state and control knobs of entities from the simulation for the agent's learning purposes.

Our frame-work is generic and can be used in various networking problems .Here, we present an illustrative example from the cognitive radio area, where a wireless node learns the channel access pattern of a periodic interferer in order to avoid collisions with it. The toolkit is provided to the community as open source under a GPL license.

Mobility in WiFi has traditionally pursued fast handover, but we argue that this is the wrong goal to begin with. Instead, we propose that mobile clients should connect to all the access points they see, and split traffic over them with the newly deployed MPTCP protocol. We let a mobile connect to multiple APs on the same channel, or on different channels, and show via detailed experiments and simulation that this solution greatly enhances capacity and reliability of TCP connections straight away for certain flavors of WiFi a/b/g. We also find there are situations where connecting to multiple APs severely decreases throughput, and propose a series of client-side changes that make this solution robust across a wide range of scenarios.

The rapid increase in the usage of the mobile internet has led to a great expansion of cellular data networks in order to provide better quality of service. The findings presented in this paper reveal that mobility prediction coupled with the multipath protocol can improve the QoS for mobile devices. These results will contribute to a better understanding of how the network service provider can offload traffic to the WiFi network without experiencing performance degradation.

Optimizing the balance between different handover parameters for network selection is one of the challenging tasks for seamless communication in heterogeneous networks. We compare our proposed scheme with existing schemes in context of energy consumption for scanning, frequent and failed handovers, packet loss ratio, and handover delay. The proposed scheme shows superior performance and it outperforms existing schemes used for similar purpose. Moreover, simulation results show the accuracy and performance of the proposed scheme.

Today's mobile devices mostly contain more than one wireless interface for Internet connection. In this paper, we propose a device-centric system that performs cost-effective network connectivity to the mobile device by selectively activating Wi-Fi communication according to the device mobility and corresponding history of Wi-Fi usage. By analyzing the device mobility using attached sensors, the system selects appropriate Wi-Fi that has been often used in that mobility state. The system was implemented in actual mobile devices that were used to several experiments we designed to prove high performance of the system.

In This thesis, we show the handover delay reduction approaches, specifically the Seamless Mobile IP. The thesis studies the effects of the S-MIP in the handover delay and the network.

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| 1. | 1.PiotrGawlowicz<br>2. AnatolijZubow | NS-3 meets OpenAI Gym: The Playground for Machine Learning in Networking Research | 2019 | It allows representing an ns-3 simulation as an environment in Gym framework and exposing state and control knobs of entities from the simulation for the agent's learning purposes. | It has high performance and efficiency. | Less security. |
| 2. | 1.Andrei Croitoru<br>2.Dragos<br>3.Niculescu<br>4.CostinRaiciu, | Towards WI-FI mobility without fast handover. | 2015 | We propose that mobile clients should connect to all the access points they see, and split traffic over them with the newly deployed MPTCP protocol | Letting mobile to communicate to multiple APs enhances capacity and reliability of TCP connections | 1.When connecting to multiple APs can hurt throughput.<br>2. Allowing WiFi clients to quickly associate to APs in vehicular mobility scenarios is not possible |
| 3. | 1. Khong-Lim Yap<br>2. Yung-Wey Chong<br>3. Weixia Liu | Enhanced handover mechanism using mobility prediction in wireless network. | 2020 | This paper presents an enhanced handover mechanism using mobility prediction (eHMP) to assist mobile devices in the handover process so that users can experience seamless connectivity. | 1.The multipath mechanism that is implemented in eHMP allows mobile devices to perform the heterogeneous handover without facing any network disruption during the handover process.<br>2. Multipath protocol can improve the QoS for mobile device. | It leads to decrease in the rate of retransmission |
| 4. | 1. Murad Khan<br>2. Kijun Han | An Optimized Network Selection and Handover Triggering Scheme for Heterogeneous Self-Organized Wireless Networks | 2014 | Most of these schemes are suffered from high handover delay, false handover indications, and inappropriate network selection for handover. To address these problems, we present an optimized network selection scheme based on the speed of a mobile node. | 1. The energy consumption during scanning interfaces is significantly reduced.<br>2.It minimizes Falsehandover indications, failed handover attempts, packet loss ratio, and handover delay. | 1. MN selects a network during handover on the basis of the speed.<br>2. The range for delay is taken from 10 to 100 (ms) depending on the number of nodes. |

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| 5. | 1.Hyunsoon Kim<br>2.Mungyu Bae<br>3.Woonghee Lee | Adaptive decision of wireless network for higher user satisfaction | 2018 | In this paper, we propose a device-centric system that performs cost-effective network connectivity to the mobile device by selectively activating Wi-Fi communication according to the device mobility and corresponding history of Wi-Fi usage. | 1. It is designed to improve high performance of the system.<br><br>2.It connection is based on device mobility and history of WI-FI usage | Since Power Monitor tool supplies power to the mobile device, the evaluation does not include any data about battery status and alteration. |

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| 6. | 1.Khalid Eltayb2.Aldalaty | Mobile IP Handover Delay Reduction Using | 2009 | We show the handover delay reduction approaches, specifically the Seamless Mobile IP. The thesis studies the effects of the S-MIP in the handover delay and the network performance as well. | 1. It reduces the delay in handovers packet which is sent across network.<br>2. S-MIP seamless Mobile IP used to reduce packet loss here. | Delay reduction is possible only in fast handovers which may lead to packet loss. |
| 7. | 1.Magagula, Linoh<br>2.H. Anthony chan<br>3.Olabisi E. Falowo | Handover approaches for seamless mobility management in next generation wireless network | 2011 | This paper gives a qualitative and quantitative review of current handover approaches of IP mobility management protocols for next generation wireless network with an objective to introduce a new way of further optimizing the handover performance. | This paper focuses on mobile IPv6 (MIPv6)-based mobility management protocols.<br>1.provides an optimal header format<br>2. neighbor discovery mechanism<br>3. improved security<br>4. quality of service<br>reasonable addressing architecture<br>5. Stateless auto-configuration.<br>. | 1. The handling of handovers between heterogeneous wireless networks in a seamless, effective, and efficient manner is the biggest challenge for mobility management protocols.<br><br>2. The disruption to ongoing communication is usually caused by long handover delays which normally result to packet loss during the handover period. |
| 8. | 1.Doohyun Lee<br>2.Daehee Won<br>3.Dough sugh | Reducing handover delays for seamless multimedia service in IEEE 802.11 networks | 2014 | The proposed scheme predicts the time that a handover process is going to start using the RSSI values and receives the lightweight base layer code of the SVC-encoded video during a certain interval before the predicted handover starts. | This scheme can minimize the service interruption times during the 802.11 handover operations, thereby increasing quality of service. | Handovers of multimedia involves many certain a requires a series of tasks to be executed 1.recognising the disconnection to the currently associated AP 2. Searching for other APs in client visibility and so on. |

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| 9. | 1.Monji Zaidi<br>2.Jamila Bhar<br>3.Ridha Ouni<br>4.Rached Tourki | Reducing Wi-Fi handover delay using a new positioning process | 2011 | This work focuses on presenting and optimizing handover algorithm. We analyze handover time in wireless local area networks based on the IEEE 802.11b MAC protocol. | Simulation results show that the proposed model provides gains in term of delays and Handover success in various scenarios. | This model is able to select the suitable access point (AP) only based on the shortest distance far from the mobile terminal (MT). |
| 10. | 1.ByungseokKang<br>2.KhuongQuocAnh3.HyunseungChoo | Implementation of fast handover for proxy mobile IPv6: Resolving out-of-order packets | 2017 | We implement both the proposed scheme and FPMIPv6 in a tested as a real network environment to demonstrate the correctness, cost effectiveness, and performance of the proposed scheme | A performance evaluation reveals that the proposed scheme can handle the Out-of-order packet problem efficiently.<br>The new Mobile Access Gateway (MAG) can control and deliver the data transmitted via the old path or the new path | Fast handovers. Efficient handovers are important than fast handovers. |

**3. Proposed Work**

RSA algorithm is a public key encryption technique and is considered as the most secure way of encryption. It was invented by Rivest, Shamir and Adleman in year 1978 and hence name **RSA** algorithm.

The RSA algorithm holds the following features −

- RSA algorithm is a popular exponentiation in a finite field over integers including prime numbers.
- The integers used by this method are sufficiently large making it difficult to solve.
- There are two sets of keys in this algorithm: private key and public key.

**Encryption Formula**

Consider a sender who sends the plain text message to someone whose public key is **(i,e).** To encrypt the plain text message in the given scenario, use the following syntax −

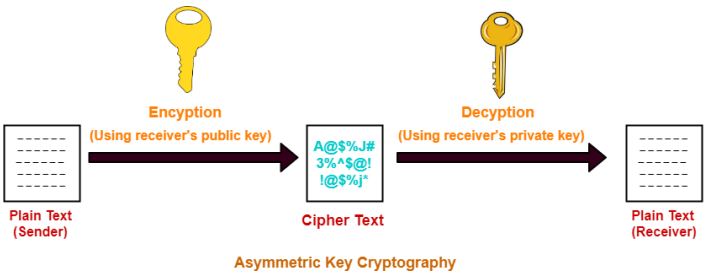
**C = Pe mod n**

**Decryption Formula**

The decryption process is very straightforward and includes analytics for calculation in a systematic approach. Considering receiver **C** has the private key **d**, the result modulus will be calculated as −

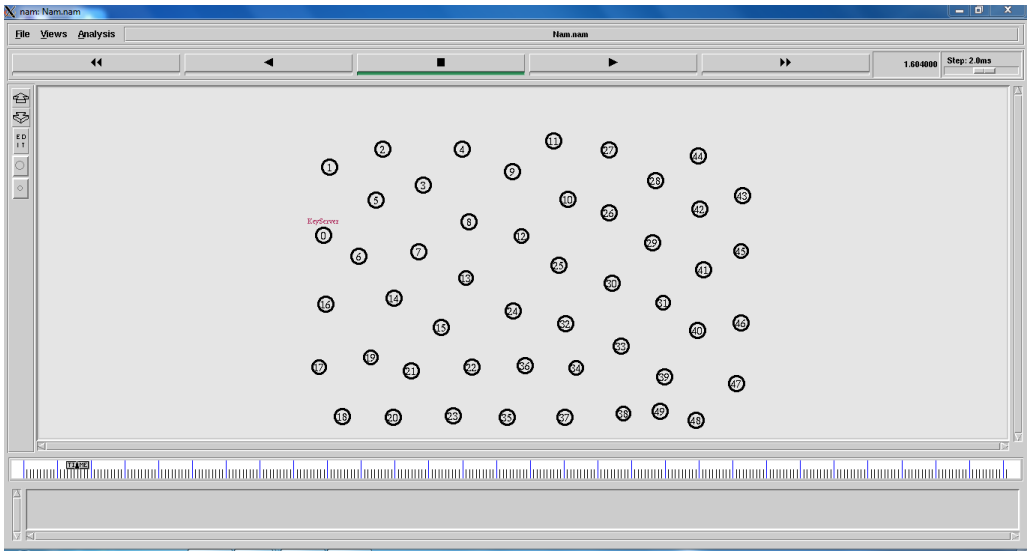
**Plaintext = Cd mod n**

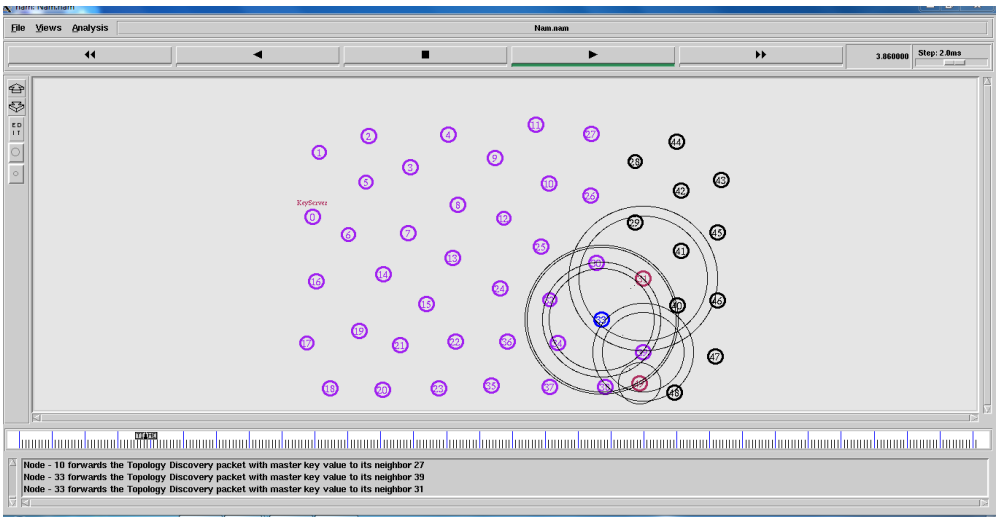
**Proposed Architecture:**

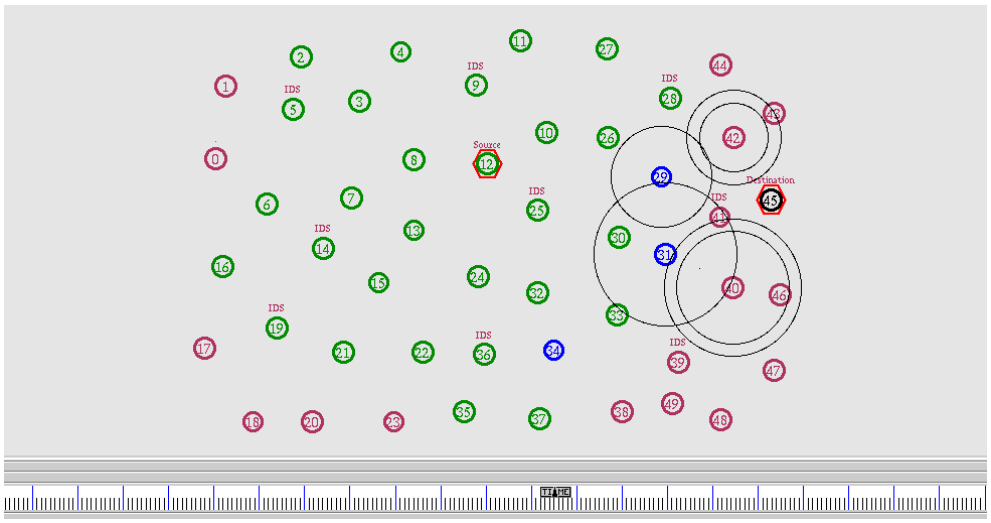



## 4. Implementation and Result:

**Output:**

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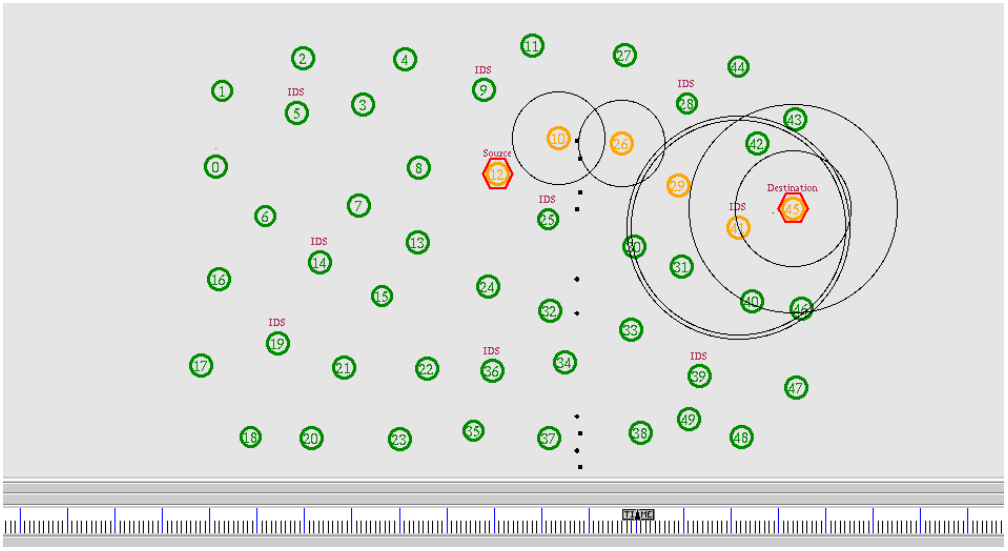
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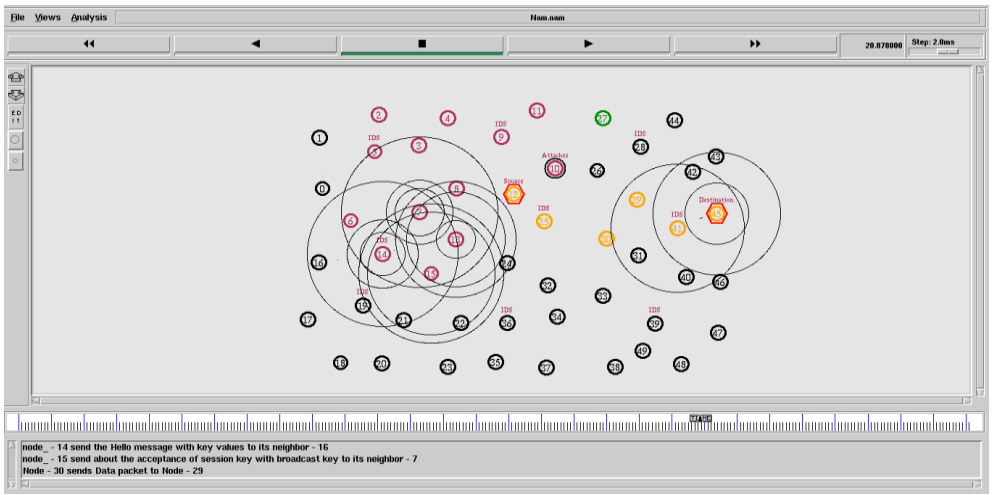
File Views Analysis
Nam.nam
node_ - 14 send the Hello message with key values to its neighbor - 16
node_ - 15 send about the acceptance of session key with broadcast key to its neighbor - 7
Node - 30 sends Data packet to Node - 29

**Platform**

1. ns-2,
2. cygwin

**Language**

Tool Command Language(TCL), C++

**5. Conclusion**

So there are many challenges faced in a hyper connected enterprise deployment centers like poor speed, fast handovers, unauthorized access, inefficiency, etc. So hereby we provide best solutions like high speed, efficient handovers, only access to authorized users, using security algorithm like RSA algorithm. So we provide an efficient connection and enhanced handovers, best security.

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