Mini Project-2

(2019-2020)

Network Congestion Analysis and Anomaly Detection

Synopsis

Institute of Engineering & Technology

Team Members:

Shani Kumar Gupta
(171500308)

Mudit Mangal
(171500194)

Supervised By:

Mr. Vinay Agarwal

Asst. Professor

Department of Computer Engineering & Applications

Main Objective:

With the enormous growth of computer networks usages and the huge increase in the number of Applications running on top of it, network security is becoming increasingly more important. All the computer systems suffer from security vulnerabilities which both technically difficult and economically costly to be solved. So Network Congestion Analysis and Anomaly detection in which we will analyze the different factors of congestion, how to reduce the congestion in the network as well as analyze the security aspects of the network so that we can enhance the security to protect the data packets and build network intrusion detection system to detect anomalies and attacks in the Network.

FEASIBILITY STUDY

Hardware Requirements Specifications:

i) Computer System with minimum 8GB of RAM
ii) Large dataset hardware recommendation

Software Requirements Specifications:

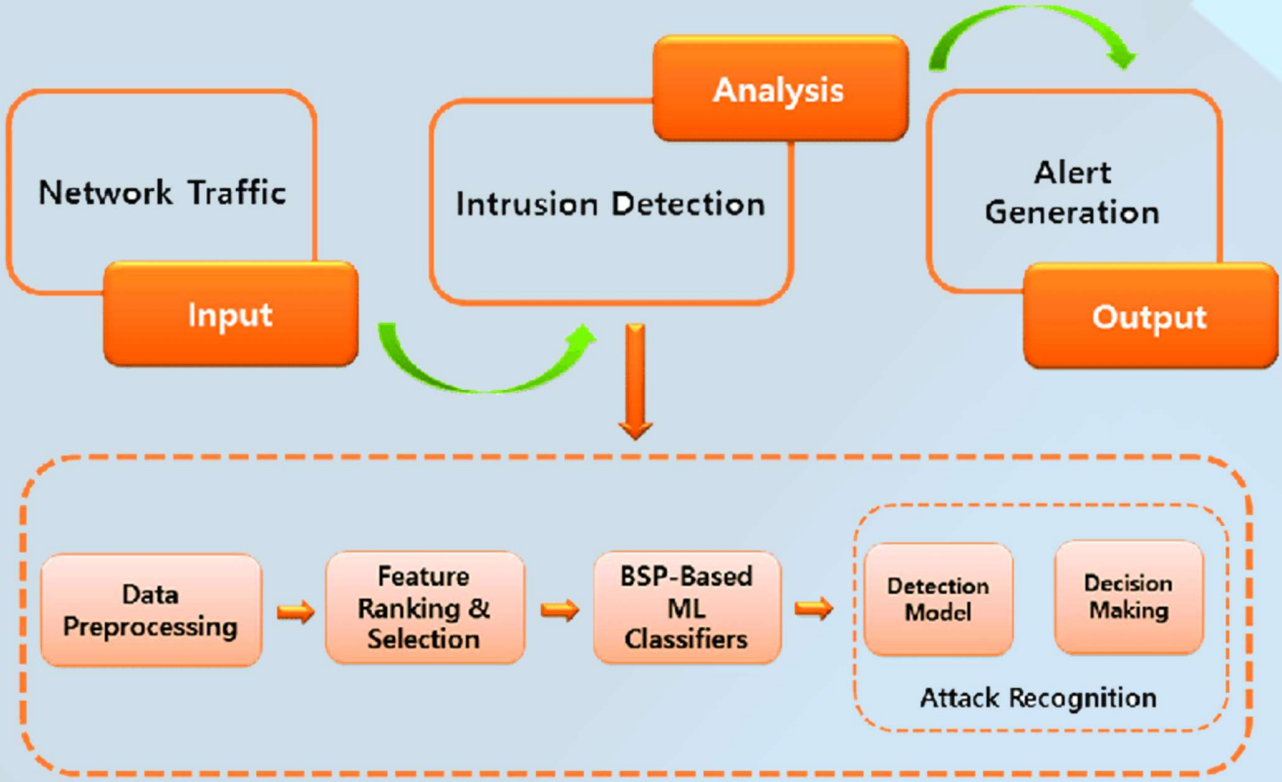
i) Linux OS
ii) NoSQL Server
iii) Hadoop
iv) RStudio
v) MongoDB

Programming language Specifications:

i) Java Programming
ii) R language
iii) Python Programming

Specifications:

i) In this project firstly we will analyze the different factors in the network which is responsible for the congestion.
ii) After finding the factors we will apply different type of algorithm to predict the accuracy of the factors which actually effect the network
iii) After this we will analyze the factors to reduce the congestion in the network so that it will minimize the effect on a network
iv) Then we will work on the security aspects of the network so that we can reduce the packet loss, drop calls and network failures
v) Then we will apply the Machine Learning Algo to predict the congestion
vi) Based on the analysis we will calculate the required bandwidth cost
vii) And build network intrusion detection system to detect anomalies and attacks



Existing System:

i) Congestion collapse
ii) Retransmission
iii) Unfair bandwidth allocation
iv) Anomalies and Malware attacks

Proposed System:

i) Buffering of packets is carried out in the edge routers
ii) No possibility of any undelivered packets presents in the network
iii) Fair allocation of bandwidth is ensured
iv) Detect the anomalies and attacks

Challenges:

i) Firstly, we face the challenge to finalize the Project idea
ii) But after finalizing the project, we faced many difficulties in finding out a large range of data sets which very important aspects.
iii) After finding dataset which ML algorithm we will use to detect the anomalies in the network

References of Datasets:

i) https://www.kaggle.com/spscientist/telecom-data
ii) https://www.kaggle.com/jiwansharma/telecomm
iii) https://www.kaggle.com/c/adcg-2016-network-anomaly-detection/data
iv) https://www.kaggle.com/anushonkar/network-anamoly-detection

Conclusion:

In this Digital Era everyone is connected through network so it is possible that the huge amount of data in the network channel can create the congestion in the network. So, it is important to analyze the network

congestion factors that we can use to reduce the congestion in the network which will also include the security aspects of data packets loss problems.

Thank You!!