Network Traffic Monitoring with Attacks and Intrusion

Detection System

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Abstract— Every organization, irrespective of its size depends on networking technologies. These networks hold the working of entire organization and thus are very important part of the organization. Being the backbone of the business, it is vulnerable to attacks from crackers and rival organizations to gain unauthorized information or to cause harm to the business of the organization. Our aim is to protect the network infrastructure of the organization by developing a software to monitor the network and detect malicious activities on it. We also demonstrate the working of the software by developing different attacks to crack into the network infrastructure. An intrusion detection system (IDS) is a device or software application that monitors network or system activities for malicious activities or policy violations and produces reports to an administrator, whereas network traffic monitoring is the process of reviewing, analysing and managing network traffic for any abnormality or process that can affect network performance, availability and/or security.

Keywords— **Network, Network Security, IDS (intrusion detection system), Network Traffic Monitoring, sniffing.**

1. Introduction
   1. *Statement of Problem*

Security is a big issue for all networks in today’s environment. Intruders can attack the system by any means to get unauthorized data or affect the performance of the network. With networking technologies and services evolving rapidly, accurate network traffic monitoring is required to ensure the security and optimize the efficiency of our networks.

* 1. *Intrusion Detection System*

The purpose of the IDS is to detect certain well known intrusion attacks on the host system and display warnings to the user and also store information regarding the IP addresses and allow the traffic based on that information.

* 1. *Network Traffic Monitoring*

Network Traffic Monitor is a network analytic tool that examines network usage and provides a display of its statistics. The purpose of the application is monitoring the IP traffic within the network and report to the administrator in case of abnormality. Network traffic monitoring and measurement is increasingly regarded as an essential function for understanding and improving the performance and security of the network infrastructure.

1. Literature Survey
   1. *Basic Terminology*

1) Intrusion: An unauthorised entry into a network or a system, frequently synonymous with an information technology security incident.

2) Network Traffic: Incoming and outgoing packets generating traffic.

*3) Attacks*: Any method, process, or means used to maliciously attempt to compromise network security.

* 1. *Need*

Any network is vulnerable to attacks from crackers and rival organizations to gain unauthorized information or to cause harm to the business of the organization. Here arises a need to protect the network from such attacks and create a safe environment where the data and all the internal working of the organisation are safeguarded.

* 1. *NIDS*

Network based Intrusion Detection System (NIDS) is a system which monitors network intrusion. Intrusion may be detected by techniques like anomaly detection, signature pattern matching etc.

* 1. *Network Traffic Monitoring*

Network Traffic Monitoring Network Traffic Monitor is a network analytic tool that examines a network usage and provides a display of its statistics. The main purpose of the application is monitoring the IP traffic between your local area network and Internet. Network Monitor is a network diagnostic tool that monitors local area networks and provides a graphical display of network statistics. Network administrators can use these statistics to perform routine trouble- shooting tasks, such as locating a server that is down, or that is receiving a disproportionate number of work requests. The process by which Network Monitor collects this information is called capturing.

1. description of modules
   1. *Attack Module*

[description]

Types of attacks

1. *DoS*
2. *DDos*
3. *SYN Flood*
4. *Brute Force Attack*
5. *Slowloris*
   1. *Network Traffic Monitoring*

Network traffic monitoring is the process of reviewing, analyzing and managing network traffic for any abnormality or process that can affect network performance, availability and/or security.It is a network management process that uses various tools and techniques to study computer network-based communication/ data/ packet traffic. The key objective behind network traffic monitoring is to ensure availability and smooth operations on a computer network. Network monitoring incorporates network sniffing and packet capturing techniques in monitoring a network. Network traffic monitoring generally requires reviewing each incoming and outgoing packet.

* 1. *Intrusion Detection*

Intrusion detection is a process that monitors network or system activities for malicious activities or policy violations and produces electronic reports to a management station.

* 1. *Integration and User Interface*

Graphical user interface will be used to combine various tools used for attacking and managing the network under a single roof, using tkinter.

1. Platform Used
   1. *Python 2.7*

Python interpreters are available for installation on many operating systems, allowing Python code execution on a wide variety of systems.

* 1. *Base Libraries*
  2. *Virtual Environment*

Virtual Environment will be required to run multiple Operating Systems simultaneously to create a network infrastructure.

1. Implementation

[screenshots and description of UI]

1. Conclusion

Intrusion Detection System on any network is capable of detecting malicious activities. In such a case the administrator of a network would be able to track the source system which is trying to attack. Network monitoring devices also notify the administrator in case of an attack. The administrator is also notified about the active users and their activities on the network infrastructure.

Organisations may employ some white hat or ethical hackers to conduct some methods in order to breach the security of the organization but in mind they are not always driven by the same motivation, no matter the end goal. So we provide a network security environment to deal with the hazardous scenarios for the network infrastructure of the organization.

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**[These are to be edited.]**

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