OpenSec: Host Based Intrusion Detection System

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Abstract - Intrusion detection system (IDS) is very important for protecting the computer system from some attacks. IDS will provide efficient solution to protect computers against intrusions and attacks. It provide security on different platform according to the security level either host level, network level or application level. It analyzes the system or network traffic, and then it detects the occurring attacks. The propose OpenSec host based intrusion detection system that allow administrator to create and implements security policies written in human readable language. There are different security techniques are available to provide security at host or in network. Some of these techniques are use in combination of two or more and some work single technique at a time. The combination of two or more IDS techniques in single system at a time makes system efficient and secure. The previously proposed system is able to detect the attacks either using signature based or anomaly based IDS. This proposed system implemented with both signature and anomaly based detection techniques for detecting the attacks. Once intrusion is detected the malicious file in packets can be block automatically. Furthermore, System performs recovery of files that get infected due to the malicious file. The proposed system improves the capacity to transfer file securely in particular LAN environment.

Keywords —Intrusion Detection, Anomaly-based Detection, Signature-based detection, Data mining

I. INTRODUCTION

The Internet is the global system of interconnection. Most of the people use internet to do day today activities. There are both harmless and harmful users on the Internet. So it become necessary to protect our systems from attacks as well as computer's overall health and helping programs run more smoothly. The firewall is used to protect computer system from different types of attacks. The Intrusion detection system is used to detect all types of malicious network traffic that cannot detected by conventional firewall. The Intrusion detection system is used to detect if someone tries to break firewall and tries to have access on any system in the trusted side and warns the system administrator in case there is a gap in the security[4].

Therefore, an Intrusion detection system (IDS) is a security system that observes computer systems and network traffic and analyzes that traffic for possible antagonistic attacks [4].Intrusion Detection Systems will provide efficient solution to protect computers against intrusions and attacks. Other than monitoring of network intruder and policy violations, the IDS can be useful to identity problem based on security policies.

A. Types of Intrusion Detection Systems

1)Network Intrusion Detection System

Network intrusion detection system is based on analysis of network traffic captured at network boundaries. Network Intrusion Detection Systems can captured the network traffic by connecting to n networking devices such router, hub, switch. The NIDS check the network attacks while packets

moving across the network. An example of a NIDS is Snort.

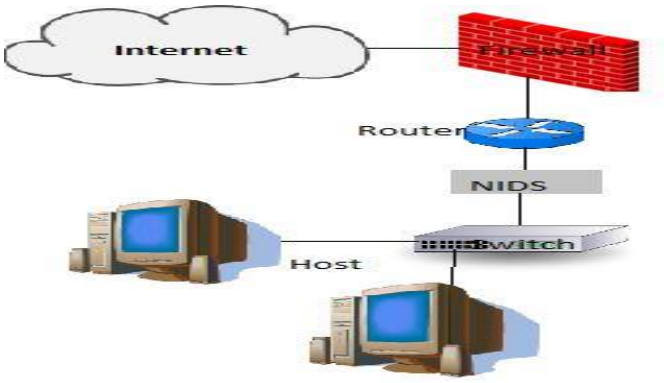

Fig. 1.1 Architecture of NIDS

2) Host-based Intrusion Detection System

Host based intrusion detection system is collect the data from host to identify intrusion. The HIDS is installed on individual host which is connected to the internet and monitor system log files, system calls, state of the machine.

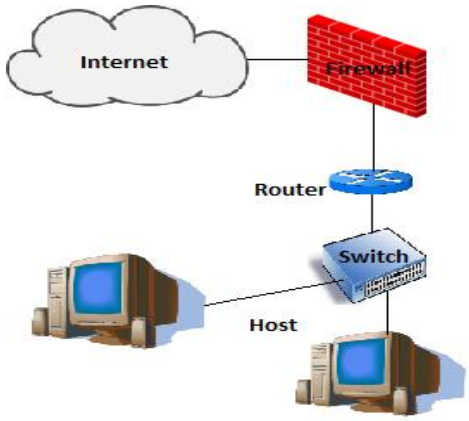

Fig.1.2 Architecture of HIDS

3) Hybrid Intrusion Detection System:

It combines host based and network intrusion detection approaches. Host agent data is combined with network information to form a comprehensive view of the network. An example of a Hybrid IDS is Prelude.

B) Methods of detection of IDS

There are two methods of detection.

1) Signature based detection

This detection technique is process of comparing the signatures of known threat with the events that are been observed. If an attacker adds any malicious code into packet it generates attack pattern or signature. Signature based IDS create databases of such pattern for detecting the known attacks.

2) Anomaly Detection

Anomaly intrusion detection is a process of comparing activities which are supposed to be normal against observed events to identify deviation. If it observes any changes or suspicious in the network from normal deviations it will immediately inform and alert about the unknown attacks.

II. LITERATURE REVIEW

Intrusion detection systems are available with various ways to detect intrusion in computer system. There are basically two techniques are used to detect the intrusion in system are signature based and anomaly based. Intrusion detection systems are either work using signature based detection or anomaly based detection technique. A signature based IDS parses large quantities of data searching for patterns which match the rules stored in its signature database. Such procedure demands high processing power and data storage access velocities in order to be executed efficiently in large networks. Signature based IDS are unable to detect new threads[3].

The proposed system is effective to detect intrusion because it works on both techniques to detect intrusion. It also performs specific selection of technique according to file which technique should applied first to perform detection which improves time efficiency of system.

III. PROPOSED SYSTEM

A. Problem Statement

The proposed security framework that allows a host security operator to create and implement security policies written in human-readable language [1], [2]. The proposed virus detection system placed at the particular host in LAN network which detect virus infection which relies on file bundle coming towards the host where actual IDS is working. The build reputation engine will decide whether data coming from that system is infected or not by using various feature vectors together.

B. Proposed System Architecture

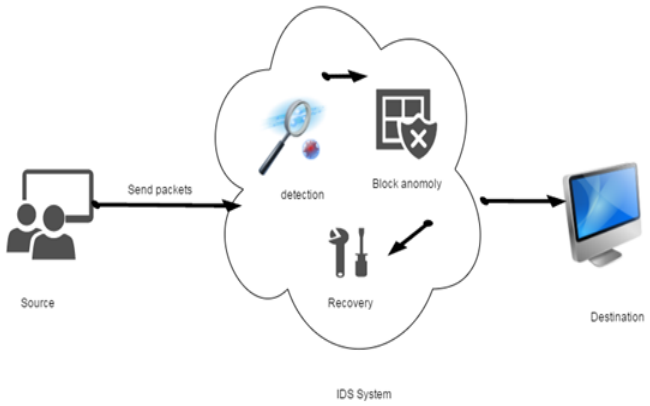

Fig. 3.1 Proposed System Architecture

In proposed system the techniques on basis actual virus detection is performed are Anomaly detection and Signature detection. There are 3 association rules are provided according to that these detection techniques work and detect intrusion in file bundle.

Proposed model consists of three parts Client side model which include simple uploading i.e. sending file bundle (number of files) to the host system where IDS is working, IDS model which perform detection and blocking of intrusion file and perform recovery of files which get corrupted due to intrusion file and Destination model which receive file bundle having none of corrupted file and none of virus infected file from IDS model for further use.

C. Implementation

Input:
A=array of anomalies // malicious anomaly list
S= array of signature // malicious signature list
FN= input file to be checked
FM= Malicious files list // used to infect the normal file

Output:
Malicious anomaly in the file
List out the signature attached to file
File attack to show file infected
Recovery of infected file in the form of creating copy or proxy dynamically

Process:
Step 1: *read the input file FN*
for j = 0 to n do //every string in FN where n denotes the reading file up to end line by line
check = FN[j] // taking each string to check variable
i = 0
4: while i <A.length do
If check equals A[i] Then
FN is has malicious anomaly
get signature of FN
k=0
sign = FN.sign
while k<S.lenght do
if sign equals S.[k] then
FN has malicious signature
Else

Add sign to S
end of while
end if
end while
end for
End

Table 3.1 Implementation

IV. RESULT ANALYSIS

Result analysis shows the performance of proposed system(IDS) again the normal system(without IDS).It shows the efficiency in file transfer rate and received at system with IDS and without IDS.

At Sender 1 sender sends 4 files in bundle having 1 file is virus file which will select any other random file from bundle and corrupt that file (change the contain of file) so, the system without IDS will received only 2 normal files. But the system with IDS will perform blocking of virus file and also perform recovery of corrupt file(infected file). So, the outcome of IDS system is 3 files which is more than the system without IDS.

User / Result	Sender 1	Sender 2	Sender 3
send files	4	4	4
normal files	2	1	4
virus files	1	2	0
infected files	1	1	0
File received(IDS)	3	2	4
File received(without IDS)	2	1	4

Table 4.1 IDS performance measurement

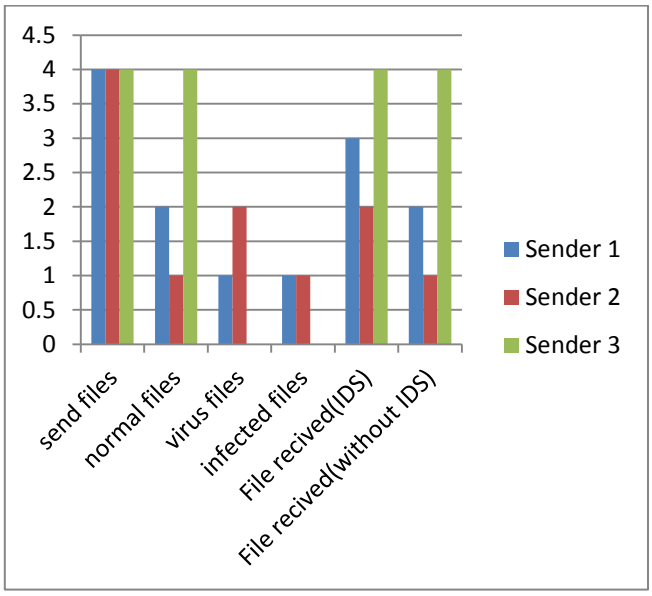

Fig 4.1 IDS performance Chart

V. CONCLUSION

The proposed OpenSec, a host-based security framework that introduces Intrusion Detection System and gives a deep understanding of some sophisticated techniques for intrusion detection. It had addressed infected files that causes the security issues, and provides a technique to prevent this attacks .

The proposed intrusion detection system is an efficient and distributed system based on anomaly intrusion detection and signature intrusion detection technique. The computer system performance is increase due to intrusion detection system which provides recovery of infected or corrupted files generated due to intrusion file.

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