IP-Tables and Shell Scripts

Rutuja Tarale [1], Chinmay Patil [2]

[1,2]*Department of Computer Engineering*
Xavier Institute of Engineering
Mahim,Mumbai
[1]*rututarale@gmail.com,*[2]*chinmaypatil1996@hotmail.com*

Abstract

The purpose of firewall using ip-tables is to control incoming and outgoing network traffic and decides whether to allow or block specific traffic based on a defined set of security rules. They create a wall between networks that are trusted and untrusted. As we are using ip-tables it is used to manage filtering and Linux firewall rules. High level ip-tables might have multiple tables and these may contain multiple chains and these chains might contain multiple rules. The most important table we are using here is filter table and it has the three main built in chains (INPUT, FORWARD, OUTPUT). This firewall can be used in the Linux distribution as the applications are not easily available and can save lot of cost, and you can get personalized setup for making changes in the rules (making it open source). This firewall can be used in servers running on Linux distribution which will block certain emails, websites, ftp, SSH, telnet. This will help us to use Linux distribution in better way. So there is not need to pay separately for services unlike other applications available in market. The user will have privilege to add/remove/functionality to the website. As it script file running so the memory utilization is more dynamic. It will be useful for people fond of open source platform and computers with low end graphics. This can be used in web hosting services, Offices educational institutions for preventing the students to login to their social media accounts, parents can use this software as parental control software. It completes the goal of providing sophisticated and secure environment for users.

Keywords: IP-Tables, Firewall, Shell scripts

1. Introduction

IP-Tables are used to manage filtering and Linux Firewall rules. This is built to reduce the problems faced by the existing system in the administrated systems. It system is designed with a particular aim for every user keeping in mind the operations in an effective manner. This makes the system more secure, reliable and fast management system. Thus it will help institution in better utilization of resources. Every organization, whether big or small, has to maintain precise records and managing the information which is great importance to that organization. This project contains a unique way of using firewall using ip-tables in an automated way. This firewall is useful for blocking certain incoming and outgoing traffic. We would install this firewall in any servers running on Linux systems. High level ip-tables might have multiple tables and these may contain multiple chains and these chains might contain multiple rules. We would make use of technique of shell scripting to

avoid typing the commands again and again and run the bunch of command in one click. This can be used in web hosting services, Offices educational institutions for preventing the students to login to their social media accounts, parents can use this software as parental control software.
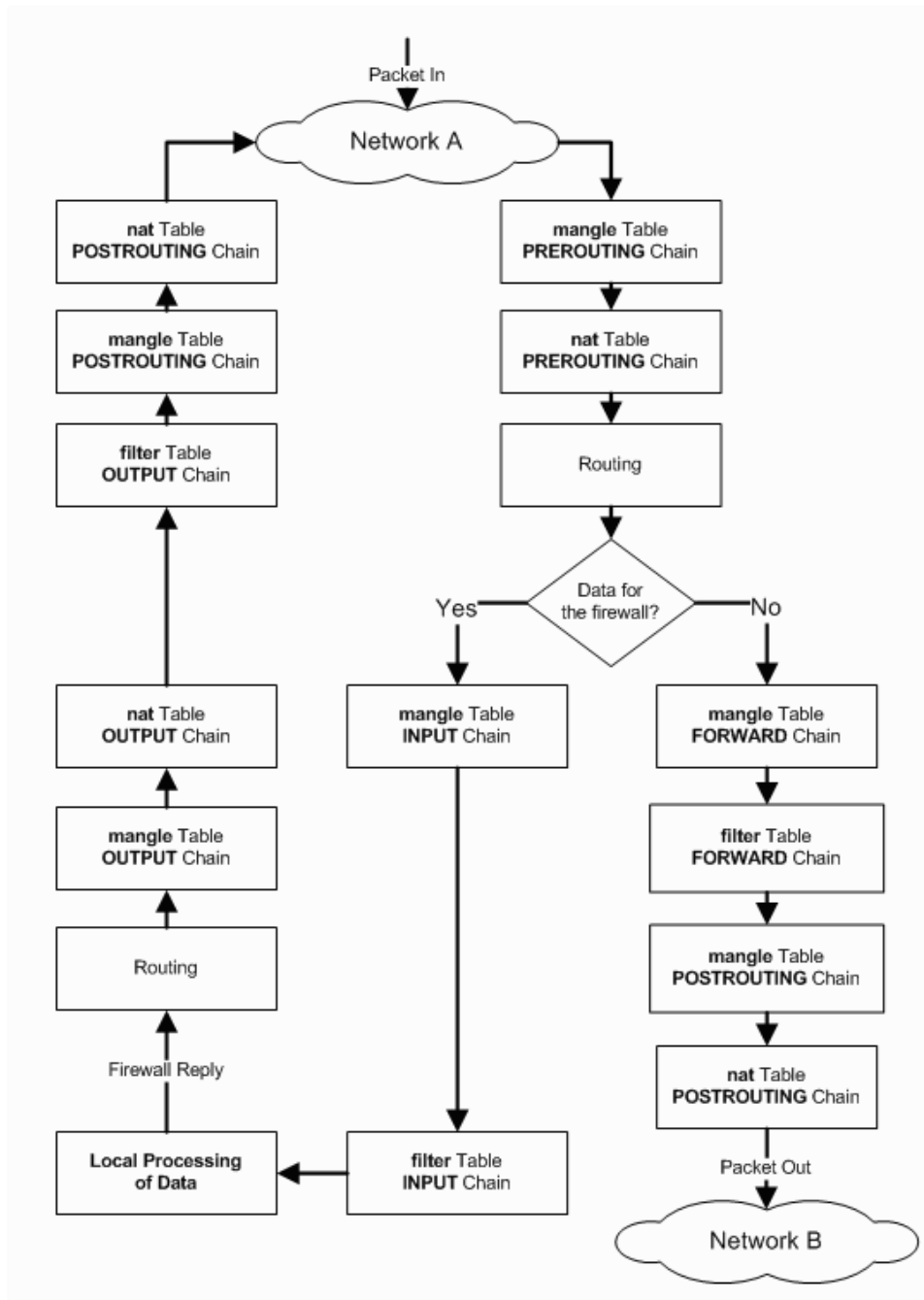
2. Flowchart

Figure 1. Flowchart of ip-tables

3. Implementation

3.1. Procedure
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It is used for building firewalls to work more securely and efficiently. It is implemented using the packets send thorough the system, where they are looped for whether the packet needs routing or not. If not then the packet is thus transferred for further processing through input chain, where all the firewalls restricts it from the only the allowed usage. Otherwise the packet is sent directly for processing through forward chain. It gives us the open source environment which gives us privilege to set our own rules and modify and add new rules to it.
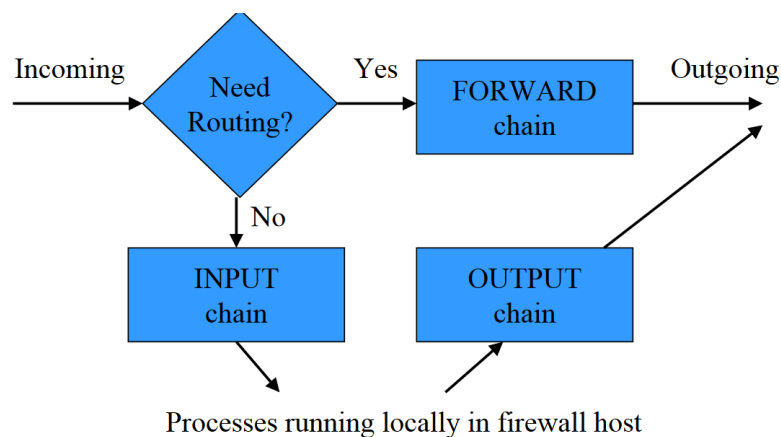
Figure 2. Working of packet routing

3.2. Basic IP-Tables operation

-I -Insert new rule

-A -Append new rule

-R -Replace rule number with new rule

-D -Delete rule number

-F -Flush the chain

3.3. Matching Parameters

-p -Protocol

-s -Source

-d -Destination

-I -Packets arriving on interface

-o -Output interface

-f -Matches fragments

3.4. Some Important Port Numbers

1) http 80,8080
2) ftp: 21(data),20(control)
3) smtp 25
4) telnet 23
5) tcp 67
6) dns 53
7) https 443
8) ssl 443
9) echo ping 7
10) ssh 22

4. Conclusion

The application of this project is infinite. One can use to block different services and computers from different network. This firewall is more secure than any other third party software available in the market. The capability of shell scripting helps us to run multiple commands and services at once and save our much time. We can use shell scripting for handling lot of resources in the network. It is one of the most effective way to handle multiple commands in Linux systems.

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