

# A Survey on Data Security Provided in Local Network Using Distributed Firewall

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**Abstract-** With tremendous increase in internet connection, the data security is important aspect for researchers and developers. The importance of network security increases as the use of internet increases for communication, data transfer. The security can be achieved by firewall. The conventional firewall is placed between the two network or entry point of one of the network. So, the data coming in the network is coming from single secure entry point and as the firewall is at the entry point of the network all inside the network are trusted. To remove the shortcomings of traditional firewalls, the concept of a “distributed firewall” has been proposed. In this scheme, security policy is still centrally defined, but enforcement is left up to the individual endpoints.

*Index Terms-* Distributed Firewall; Network Security; Pull Technique; Push Technique; Policy Distribution

## 1. INTRODUCTION

All the necessary information in daily life is available on the internet. So, Internet Connectivity is no longer optional for any person or organization And now computers are mostly use for transfer of data than the processing. So, Network Security is needed to provide authenticated data transfer for secure communication. A firewall is a device which decides to permit or deny the network transmission. Conventional firewalls are situated at the entry point of a network and hence the failure of that single entry point causes to fall of network security [1].

The Distributed firewall is centrally managed and distributed over the network with the connected systems i.e. with end points. In the distributed firewall the security policy is centrally defined and implemented at the end host. As distributed firewall implemented at the end host security no longer depends upon the single entry point. The Distributed firewall filters the data from internet as well as internal network. In the distributed firewall data on the protected side is not taken as trusted and hence the attacks which happens from inside are detected [2].

The problems with conventional firewalls which lead to implement Distributed Firewalls are as follows.

- Depends on the topology of the network [3].
- Do not protect networks from the internal attacks [3].
- Unable to handle some protocols like FTP and Real audio [3].
- Have single entry point and the failure of these results into problems [3].
- Network bottleneck and congestion [3].
- Unauthorized entry points can bypass the network security [3].

## 2. GENERALIZED DISTRIBUTED FIREWALL

In Distributed firewall, The conventional firewall is not only placed at the entry point of one network or between the two networks. The roll of conventional firewall is distributed over a network. At each end host system have a firewall typically under a control of centralized system which defines the policies implemented at the end host. Because of distributed behavior the bottleneck, congestion, failure of single entry points are not occurred.

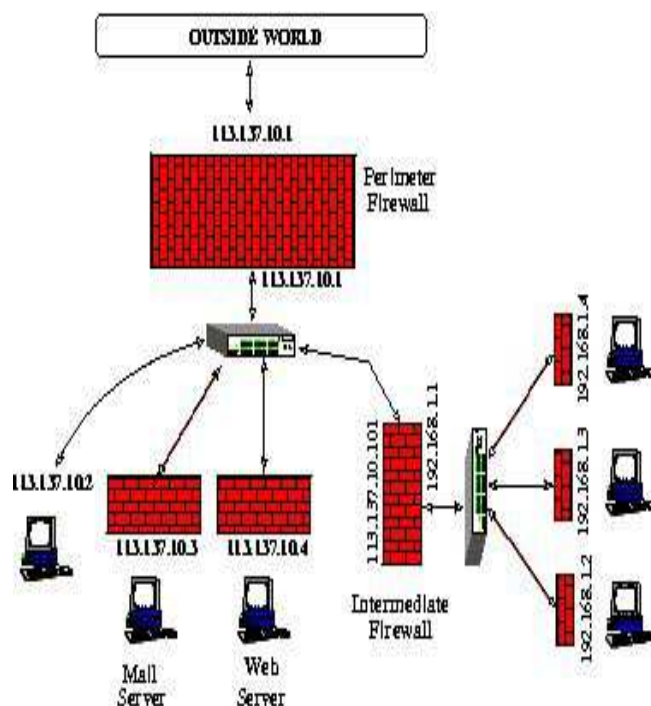


Figure 1: Generalized Distributed Firewall

In the figure above a conventional firewall is maintained at the network border, although the presence of a distributed firewall solution is being deployed to protect each network endpoint.

### **3. POLICIES OF DISTRIBUTED FIREWALL**

Policy is one of the most often used terms in case of network security and in particular distributed firewall. A “security policy” defines the security criteria of a system. The security policy is defined for whom transmission is allowed or denies. With the implementation of the distributed firewalls the policy can be varies. It can be pulled to end host or pushed whenever necessary.

#### **3.1. Pull technique**

The end host checks by sending some ping whether the central management server is up and active. It registers the central management server and requests for the policies which it should implement. In reply the central management server provides the security policies to the end host [4, 5].

#### **3.2. Push technique**

Whenever the policies at the central management system changes by the network administrator push technique is applied. The push technique always keep the end host updated with the security policies [4, 5].

### **4. COMPONENTS OF DISTRIBUTED FIREWALL**

- A central management system for designing the policies.
- Policy distribution to transmit these polices.
- Host-end implementation of the designed policies in the client end.

#### **4.1. Central management system**

Central Management Servers main work is designing the policies. It is a component of distributed firewalls which makes it practical to secure organizational systems. It maximize network security by enabling policies which are centrally configured [5].

#### **4.2. Policy distribution**

The policy distribution scheme should guarantee the originality of the policy during transfer. The distribution of the policy can be different and varies with the implementation. It

can be either directly pushed to end systems, or pulled when required [5].

#### **4.3. Host-end implementation**

The policies from central management server should be implemented at the end host. The correct host end implementation is necessary for success of distributed firewall [5].

### **5. LITRATURE REVIEW**

A lot of work has been done over the previous years in the area of firewalls. It describes the host resident approach of firewall, similarly as we have discussed in this paper.

One of the first conversations of distributed firewalls was given by Bellovin, which described a distributed system of firewalls with a security policy, but the security policy is centrally managed [7].

The Napoleon system defines a layered group-based access control scheme that is in some ways similar to the distributed firewall and it is mostly targeted to RMI environments[5].

Ehab Al-Shaer, Hazem Hamed, Raouf Boutaba, and Masum Hasan presented a set of algorithms and techniques to automatically discover rule anomalies in centralized and distributed firewalls [8].

Yunus Erdogan gives discussion about Development of a Distributed Firewall Administration tool [9].

Ongoing development and research in the field of firewall technology have shown a continuous addition of features and services to conventional firewall systems as well as applying the concept of distributed firewalls in new products.

### **6. ADVANTAGES OF DISTRIBUTED FIREWALL**

- (1) Does not depend on topology of network.
- (2) Because of Distributed behavior Protect from internal threads.
- (3) Able to handle protocol like FTP and Real audio.
- (4) May have multiple secure entry points.
- (5) Do not occurs bottleneck and congestion because multiple secure entry points.

## **7. DISADVANTAGES OF DISTRIBUTED FIREWALL**

- (1) If the Central Management System is compromised, due to attack or mistake by the administrator, this situation is very risky for security of the entire network.
- (2) It is not so easy to implement an intrusion detection system in a distributed firewall environment [7, 10].

## **CONCLUSION**

With the vast use of internet for data transfer the conventional firewall is not enough for providing secure authenticated data. So, by using distributed firewall concept we can achieve,

- Complete protection to the network.
- Protection to the clients of the networks from the internal and external attacks.
- Can allow or deny the traffic meant for a particular system based on the policy it has to follow.
- Because the firewall is distributed across an entire network, the load of processing is further distributed as the network grows, so performance remains high.

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