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NETWORK SECURITY: ATTACKS, TOOLS AND TECHNIQUES



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ABSTRACT:

Network security is main issue of this generation of computing because many types of attacks are increasing day by day. Establishing a network is not a big issue for network administrators but protecting the entire network is a big issue. There are various methods and tools are available today for destroying the existing network. In this paper we mainly emphasize on the network security also we present some major issues that can affect our network.

KEYWORDS

Network Security, Threats, Cryptography, Ping.

INTRODUCTION :-

The security of network is a big issue for security administrators because network is growing day by day. Security on the Internet and on Local Area Networks is now at the forefront of computer network related issues. Network security consists of the provisions and policies adopted by a network administrator to prevent and monitor unauthorized access, misuse, modification, or denial of a computer network and network-accessible resources. Network security involves the authorization of access to data in a network, which is controlled by the network administrator. Each and every client who is working on the internet wants security of information but sometimes he or she do not know that someone else may be an intruder is collecting the information. Information is an asset that must be protected. Network security is the process by which digital information assets are protected, the goals of security are to protect confidentiality, maintain integrity, and assure availability. To secure the information and the entire network system, one specific methodology is required which can be capable of providing the complete security solutions.

BASIC TYPES OF ATTACKS

Here we are presenting some basic class of attacks which can be a cause for slow network performance, uncontrolled traffic, viruses etc.



C. Unauthorized Access



D. Information Theft and cryptography attacks

Another threat to a network is to loss of the important information and this loss can be prevented, if you good encryption methods such as 128 bit security or 256 bit security encryption methods. In this way, your data when transferred through FTP programs, can be encrypted and can't be read or use.

E. Unauthorized application installations

Another virus and security attack prevention method is to install only the authorized software applications to our network server and your all client computers. Nobody should be allowed to install any kind of program which can cause security threats such as songs or video programs, codec, gaming software or other web based applications.

F. Application-Level Attacks

The attacker exploits the weakness in the application layer – for example, security weakness in the web server, or in faulty controls in the filtering of an input on the server side. Examples include malicious software attack (viruses, Trojans, etc.), web server attacks, and SQL injection.

BASIC SECURITY TIPS

This basic Network Security Network security is the most vital component in information security because it is responsible for securing all information passed through networked computers . to the network users.

Following are the basic security tips:

- **Update your system.** It is very common for exploit tools to use old attacks that have subsequently been fixed. For example, out of date Java or PDF software are very commonly targeted. And still, a large number of users won't update. Make sure you have the latest version of all software.
- **Get a decent password.** There are plenty of great articles out there that suggest how to generate a good password. And yet, it is amazing when you review password lists for large public websites that have been leaked how common it is for people to use basic passwords like 'password2013' or 'linkedinpassword.' You should also make sure you use different passwords for different sites and services, or consider using a password manager to look after them for you.
- **Be a little suspicious.** A very large number of attacks rely on simple social engineering. Ask yourself next time you receive an e-mail claiming you have won an iPad or received a FedEx package — is this probably real? Would it happen to me walking down the street? Scams today aren't all identifiable by poor grammar and spelling mistakes, as they once were.
- **Keep a backup.** Some attacks now do permanent damage that cannot be reversed. Whilst most attacks are still focused on reputation damage or fraud, these attacks can be extremely damaging. A tried and tested backup procedure can save you severe pain.

•**Make sure you run basic security controls** Lots of people run severely out-of-date anti-virus software. Whilst there is no 100% in security, and AV won't block everything, it remains a good basic step for keeping your system clean.

•**Make sure you look up best practice for devices other than just your PC** You may have secured your computer, only to put very similar data on your mobile device with no security checks at all. There is an increasing amount of malicious code focused on Android mobile phones. And I find a lot of people don't bother to protect their iPhone with a pin or lock screen. (It will be interesting to see how many people use the new fingerprint feature.) Check out the security best practices for each and every one of your devices.

A. Turn Off Ping Service

The primary purpose of a ping request is to identify hosts that are currently active. As such, it is often used as part of reconnaissance activity preceding a larger, more coordinated attack. By removing a remote user's ability to receive a response from a ping request, you are more likely to be passed over by unattended scans or from "script kiddies," who generally will look for an easier target. Note that this does not actually protect you from an attack, but will make you far less likely to become a target. For disable ping outside from your public IP: for that, the icmp-config would be the following: icmp deny any echo outside icmp permit any outside echo requests get dropped, but all the other icmp types are still allowed.

B. Close unused ports

Ports let the outside world communicate with your computer. Think of a port as a door: when the door is open, anyone can get inside. A closed port keeps your computer safe from unwanted outside communication. In There are various ports and maximum are by default open in our computer like FTP, TELNET, UDP, SMTP, FTP etc. In general we need only some port like FTP, HTTP etc. If someone wants to enter in our network or system they used these types of open ports. So if not necessary close unused ports. Malicious hackers (or crackers) commonly use port scanning software to find which ports are "open" (unfiltered) in a given computer, and whether or not an actual service is listening on that port. In contrast, a port which rejects connections or ignores all packets directed at it is called a "closed port"[6]. Ports can be "closed" through the use of a firewall.

C. Bind IP To MAC Address

We know that MAC address is unique number which cannot be changed. We can make a list of IP address used in our network and then bind those IP addresses to the particular systems MAC address. After doing this activity no one can use out sider system or laptop in your system . Command for mac binding -:

For example fastethernet port 1
Switch (config) press ctrl+z
Switch # write press enter D.

Use Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS) An intrusion detection system (IDS) inspects all inbound and outbound network activity and identifies suspicious patterns that may indicate a network or system attack by someone attempting to break into or compromise a system. IDSs use traffic analysis and advanced algorithms to determine if a probe has been conducted. Many IDSs are designed to address increased requirements for security visibility, denial-of-service (DoS) protection, anti-hacking detection, and e-commerce business defences. An Intrusion Prevention System (IPS) can take the work of the IDS one step further, by taking immediate action that does not require human intervention, as IDS alarms are generated based on a predefined set of rules.

CONCLUSION

There are a variety of ways to guarantee the protection and security of your network. Perform regular network security testing. Don't give a lot of or unwanted access to any network user. Must have an updated antivirus program. Software systems ought to be often updated. If you have got windows primarily based software system you'll update it from the Microsoft web site. Keep inventory of your network resources like devices and package applications. Shut down your laptop after you are away and don't leave your laptop unattended. Place a powerful network and supervisor password. Use a switched network, in order that you'll determine the matter terribly quickly.

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