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**DECLARTION**

We all are hereby declaring that presented report of our project (Malware Analyzer) is uniquely prepared by us. This project enhances our skills of learning and understanding things in the field of Network and Computer Science. The report contains about all the excepted things from Malware Analyzation.

**ACKNOWLEDGEMENT**

We are highly grateful to, Preeti Kaushik ( Assistant professor ) for providing this golden opportunity to do this wonderful project. We would like to express our warm thanks to her without her instructions and guidance it is hard to complete the project on time.

**INTRODUCTION**

Malwares are the malicious software which are designed to harm the system. Malware is capable of corrupting, executing itself, and executing the system remotely without the knowledge of the user. In addition to denial-of-service attacks, malware can breach security principles such as confidentiality, integrity, authentication, and secrecy. The ability to replicate is one of the most crucial qualities of most viruses, as it assures its survival. In some cases, the virus can damage the Ram, SSD, or hard disk of the computer. When the malware enters a system, it multiplies drastically and crashes the operating system by sending the large amount of process to CPU.

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**Fig:1 (Malware Attacking)**  **Fig:2 (Portable Executable)**

**Types of Malwares**

1. **Virus:** It is a type of malware in which the malicious code is attached which attacks the system and cause the damage.
2. **Worms:** It is a type of malware which get the details of infected machine.
3. **Trojans:** It is malicious software which is used to control the system.
4. **Spyware:** It is not a malicious but used to steal your personal information, credit card information etc.
5. **Rootkits:** It allows the user to gain the access to the user’s computer without knowing.
6. **Adware:** It is unwanted software that displays advertisement.
7. **Ransomware:** It is malicious software that seize the data until and unless the targeted victim pays the money.

## How do you detect malware?

## Popup ads pop up everywhere when you use your system.

## Some apps may disable crashes repeatedly.

## An unknown apps notifies for installing malicious apps

## The Random posts appear on your social media.

## Your system tools may disable, and system may hang and do not work properly.

## Virus puts stress over the CPU that overload it which result in crashing the system.

## Booting time may affect.

**Difference between Malware and a virus:**

1. **Malware:** Malware is a malicious software which harms the data. A malware can cause a system to slow or crash without the user knowledge. The malwares are of many types that includes:

* Trojans
* Spywares
* Adware

1. **Virus:** A virus is a something that can modify and remove the data of user.

A picture containing graphical user interface

Description automatically generated

**Fig 3. Basic idea of malware attacking**

**ABSTRACT**

Malware is a malicious software which enters the computer without the permission of the administrator. The software which are being downloaded from the non-trusted websites may contains the malicious software. In this world every second the malwares are being created. Whenever we download some paid software for free the cracker put the malware on that software and may use once’s machine as a botnet .

**MALWARE TECHNIQUES**

There are many techniques to detect a malware. They include:

1. **Signature Based Techniques**: When a software is being created then it has some binary code that binary code is known as the signature. This code is based on different types of algorithms depends on what types of software is that. When a malware enters a system, it multiplies itself to destroy the other files.

**Types of Signatures:**

* **Host-based signatures:** It identifies the key in victim’s computer. It focuses on actions of malware, not the malware itself.
* **Network signatures**: It identifies the malware using networking.

1. **Heuristic Based techniques**: It is technique which works well with Signature based technique for an antivirus program.
2. **Behavioral Based Techniques:** This is method which works well when there is a malicious performance done by a malware in the system.
3. **Data mining Strategies:** Data mining strategies finds if the program is a malware or any other by detecting the hidden data of the file which is written in C language.

**Our Approach**

**Basic Analysis:**

* **Static Analysis**:
  + It examines malware without running it
  + The code is being identifies without decompiling the file.
* **Dynamic Analysis**:
  + Actually, running the malware and taking its effect
  + Use a virtual machine so that actual machine would not affect and analyze it.
  + Examples of some tools are Reg-Shot, Process Monitor, Process Hacker, Capture-BAT

**Advanced Analysis:**

* **Static Analysis:**
  + It works on reverse engineering with disassembler and assembler.
  + Highly complex and advanced.
* **Dynamic Analysis:**
  + Run code in Debugger to examine the internal code

**Working of the tool**

**Brief Introduction:**

* The tool is going to work on the concept of python programming.
* We have used the following built-in modules of the python in the source code:
  + Hash-lib Module
  + Time Module
  + Operating System Module
  + Struct Module
  + Request Module
  + PE(Portable-Executable) file Module

**The tool is used for Static Analysis of Malware**

**DESCRIPTION**

* This is a portable script written in python used for "Static Analysis" of malwares. Focus on malware PE Headers, Strings, Image Type, MD5 Hash, Virus-Total Analysis. You can skip Virus-Total API Key if do not want to upload your sample on Virus-Total. Supported wherever python is installed (Tested on Linux, Windows). Malware Analyzer will generate 4 output files in the same folder as the script: Strings.txt for the extracted strings, PE Analysis.txt for PE headers, VT Basic Scan.txt and VT Scan.txt for virus total analysis.

**The capabilities of the tool**

* **Strings:** Strings are the series of character give help in functionality and indicators for binary suspension.
* **Hashes:** Hashing is an algorithm that calculate the string value from a file. The hash file can give the information about the file.
* **Address of Entry point:** It is the virtual address entry point which is required for execution of the malware tool.
* **Relative Virtual Address:** This is image file after it loaded in the memory.
* **No of sections:** There are 13 sections in an executable file which comprises of 8 sections of Portable Executable format and 5 sections of packing algorithm.
* **Virtual Address:** The virtual memory is being used by the applications to run. In other words, the Virtual Addresses (VAs) are the memory addresses that are referenced by an application.
* **DLL:** DLL stands for “Dynamic Link Library” file which is system extension for computer and helps in system functioning.

**Table of Analyzation**

* + - 1. **P.E of Notepad**

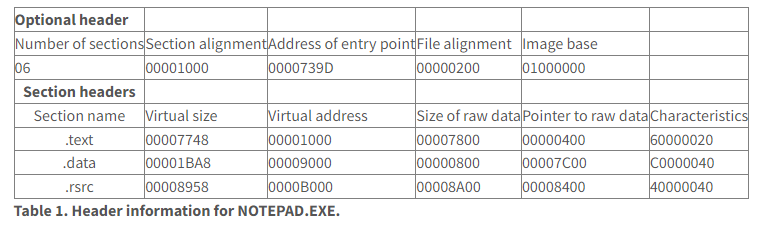


Fig 4

* + - 1. **P.E of NS Pack (Malware)**

Table

Description automatically generated

Fig 5

* + - 1. Table

         Description automatically generated**I-Tunes**

**Fig 6**

* + - 1. Table

         Description automatically generated**Disk-cleanup**

**Fig 7**

**Final Analysis of some samples**

**Table

Description automatically generated**

**Fig 8**

**Conclusion**

* We have tested 4 different software and prepared the PE file of each one.
* Out of four one software is a Malware
* If the tool gives all the necessary information about the software like Image address, Relative Virtual Address, (.txt file), (.data file), Virtual Address, resources and many other than the software is not a Malware.
* After analyzing the notepad, I-tunes, disk-cleanup all the necessary information have been collected but Ns malware has not provided full PE file report then we can conclude that it is Malware.