Proof of concept; a worm botnet.

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Declaration

I herby certify that this material, which I now submit for assessment on the programme of study leading to the award of Degree of **Bachelor of Science in Computing in Digital Forensics & Cyber Security** in Technological University Dublin, is entirely my own work except where otherwise stated, and has not been submitted for assessment for an academic purpose at this or any other academic institution other than in partial fulfilment of the requirements of that stated above.

Dated: 04/15/2023

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Abstract

Abstract

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Keywords: Botnet, malware, virus, rust, TODO.

Contents

I. Introduction

I.1. Definitions

In a world where more and more things rely on computing, it is necessarry to know how virus works, especially some of the worse ones. Worms, a type of virus that can self replicate in order infect more and more, is one of them. It is usually use to lauch some ransomewares and other denial of service attacks. Because of it's self replicated nature, once launched, it doesn't need a head to continue spreading if it's codded to do that. It have also the good ability, depending what is it's purpose, to conceal the pirate. Botnets, another type of virus that takes control of multiples machines in order to do evil things, like Distributed Denial of Services (DDOS) attacks, or win more power in order to either mine cryptomoney, or crack password are another.

I.2. Origins of the project

This is where the idea of the project started. Because one of the huge flaw of botnet is that they need a head to works, we think of this idea. What if we can allied the ability to conceal the perpretrator of the attack from the worm, and the ability to control bots of a botnet? More precisally, our idea is to make a botnet that spreading like a worm, so that only a verry little quantity of machine actually knows the address of the head of the botnet. We remind here that our project is simply a proof of concept, and so, it's only meant to be shown in the final demo of the project. Several parts of it, if not all of them, would need real improvments, in order to overcome some of it's limits. Again, we remind that this project isen't meant to show the virus of the future, but only to show, and give a proof of concept, of a type of botnet there isen't enough research on it. Indeed, the closest thing we could find to our idea, was Peer to peer botnet, but even so, we couldn't find any name of existing, or botnet that have existed using theses implementations. (https://ieeexplore.ieee.org/abstract/document/5684002/) (https://citeseerx.ist.psu.edu/ document?repid=rep1&type=pdf&doi=5de6987574e48076fa5f024f347d44c77a6fa080) We can also added to it that we were interested by the field

I.3. Preliminary research over an existing botnet and an existing worm that appears in the last 25 years.

Before begining to talk about the implementation of our botnet, let's find three examples of pretty well known worm and botnet, to get an idea of what already exist.

The first worm that we find was wanacry. (https://en.wikipedia.org/wiki/WannaCry_ransomware _attack) It's a bot which appeared on 2017 and targeted only Microsoft windows softwares. It was spread using a critical vulnerability of the SMB server that is on every windows machines. The way it's works is the same way as most worm, that means that if a machine is vulnerable, the worm will drop and exec a file, wich goal is to first self-replicate the worm, install a ransomware, and target other machines. (https://www.csoonline.com/article/563017/ wannacry-explained-a-perfect-ransomware-storm.html)

The other example we choosed, is the opensource, mirai botnet. (https://en.wikipedia.org/wiki/ Mirai_(malware)) It's a botnet spreading over ports 23 and 2323, in order to make new bots. It's way of working is simple. It tries to bruteforce some linux iot devices, using the default built-in credential, assuming that nobody changed it. After that, the bot awaits it's orders. Usually, it was to DOS a DNS server or a big cloud company.

Another botnet example, is the so called Hajime botnet (https://en.wikipedia.org/wiki/ Hajime_(malware)) which goal was simply to protect device against the mirai botnet, by closing telnets ports. This is a really well know botnet, using peer to peer capabilities, to hide it's owner address, and thanks to that, makes it a lot more difficult to be blocked by ISP to takes down the botnet. (https://thehackernews.com/2017/04/ vigilante-hacker-iot-botnet_26.html)

II. Our choice and design

II.1. What make us choose a botnet

When we began to work on the project, we first had to choose a good project. Many other choose to make a website or something related, but we were more interested in cybersecurity related stuff. That why, our first idea was to make a honypot. But the problem was that soon enough, we realise that we couldn't get any good ideas, or realisables ideas in the time we had. Because of that, we decided to change. We thought, what if we decided to make a malware? Our first idea was to make a software, with a backdoor inside. But the backdoor is for doing what? We choosed to add it to a botnet. As the project matured, we decided to not making the backdoor, bot only the botnet, and the way it will be ran will be by a remote code execution exploit.

II.2. Plan and idea of the botnet

The first part of every project, when we know what project we want to make, is to design it. We first choosed, the languaged that we were supposed to use. We choosed RUST. It's a fast language like C, but everytime you compile, it gives you some tips on how to solves problems in your code. It's other big advantage is that it's a modern language, with a lot of modern feature, and constantly check that there is no problem with the memory allocation. None of us is a experienced developper, as such, learning rust was the most adapted thing we could made for the project. After that, we made a list of the differents parts of our project.

- sandboxed environment to avoid it to spread
- find an exploit to use
- make the actual botnet
- find a way to make the exploit run the botnet.

II.3. design explanations about the botnet.

about the sanboxed environment

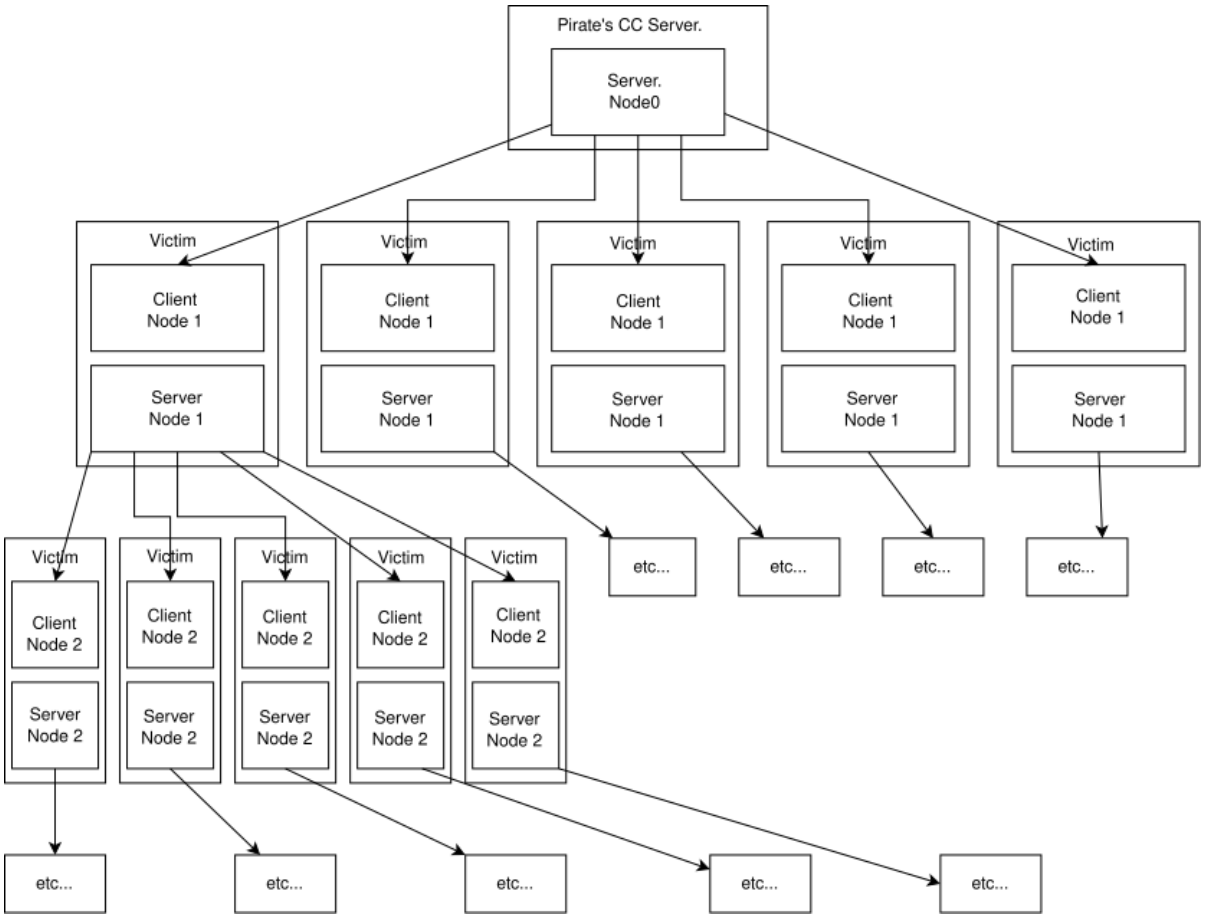
The first part for this project to run properly was to make the sandboxing environment. Fortunately, to makes one isn't that difficult. We decided to use qemu, and make three mode. First, the instalation mode, use to install the linux system on an image. Second, the networking mode, or maintenance mode, use to install our botnet, or the software which contain the vulnerability. Lastly, the sandboxed mode, use for when we will actually run our botnet.

how the botnet will be supposed to work

Our way to make it works is from a simple basic. We planned to make juste a server and a client. The server will have three role. 1st, deliver the exploit to gain 5 bots. 2nd, deliver command to thoses bots whenever they asks to do something. 3rd, deliver it's own code to self replicate.

The client, run by the exploit on the victim machine will do; 1st, connect to the server to get the list of the files to download. 2nd, download the files from the server to became a full node. 3rd, launch another server, to become a node by itself. 4th, at the same time as running the server, every 12h, get from the node parent the order file, execute the order, and make it available to the lowers nodes.

A fully devellopped botnet should look like this.



III. Part 2

III.1. Something part

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IV. Part 3

IV.1. Something part

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Conclusion

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Glossary

- **Botnet:** A type of malware which takes control of numerous machines to lauch somes attacks. Althought it's usually used to lauch denial of services attacks, it can also be used to crack password or even mine cryptocurrency.
- **Other example:** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque viverra pulvinar dui ut venenatis.

Refenrences

[1] This website is the first example that came to my mind as an example.. https://example.com

[2] This is another example to show peoples what is en entry in the references chapter.
https://secondexample.com