



CROWDSTRIKE

# CrowdStrike Detection Report “TheZoo”

**ZUP Security Labs at Zup Innovation**

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# 1 Document Control

## 1.0.1 Version Control

WRITERS	DELIVERY DATA	PAG.	VERSION	STATUS
Filipi Pires	19/10/2020	18	1	Final Version

## 1.0.2 Document Distribution

NAME	POD	Project
Filipi Pires	Core Shield	Security

## 2 Introduction

The purpose of this document, it was to execute several efficiency and detection tests in our lab environment protected with an endpoint solution, provided by **CrowdStrike**, this document brings the result of the defensive security analysis with an offensive mindset performed in the execution of 33 folders download with **Malwares by The Zoo** repository in our environment.

Regarding the test performed, the first objective it was to simulate targeted attacks using known malware to obtain a panoramic view of the resilience presented by the solution, with regard to the efficiency in its detection by signatures, downloading these artifacts directly on the victim's machine. The second objective consisted of analyzing the detection of those same 32 folders download with Malwares (or those not detected yet) when they were changed directories, the idea here is to work with manipulation of samples (without execution), and the third focal objective it was the execution of a *ScanNow* inside victim's machines for effectiveness analysis.

With the final product, the front responsible for the product will have an instrument capable of guiding a process of mitigation and / or correction, as well as optimized improvement, based on the criticality of risks.

### 2.0.1 Scope

The efficiency and detection analysis had as target the Cybereason Endpoint Protection application (<https://cloud.crowdstrike.com>) in **Version**:

- **Sensor Version = 5.36.11809.0**

Installed in the windows machine **Windows 10 Pro**;

**Hostname** - **Threat-Hunting-Win10-POC**, as you can see in the picture below:

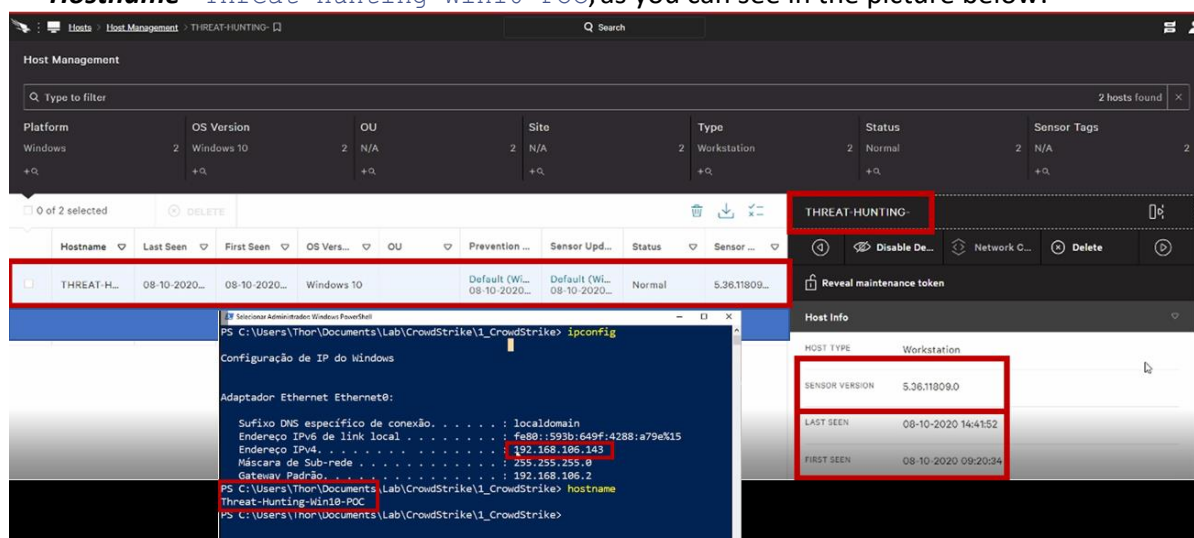


Image 1.1: Windows 10 Pro 2019 Virtual Machine

## 2.02 Project Summary

The execution of the security analysis tests of the Threat Hunting team it was carried out through the execution of 33 folders with many Malwares in a virtualized environment in a controlled way, simulating a real environment, together with their respective best practices of the security policies applied, the test occurred during **2 days**, without count the weekend, along with the making of this document. The intrusion test started on **October 08<sup>th</sup>** of the year 2020 and it was completed on **October 19<sup>th</sup>** of the same year.

# 3 Running the Tests

## 3.1 Description

A virtual machine with Windows 10 operating system it was deployed to perform the appropriate tests, as well as the creation of a security policy on the management platform ([Threat-Hunting-Win10-POC](#)) e and applied to due device.

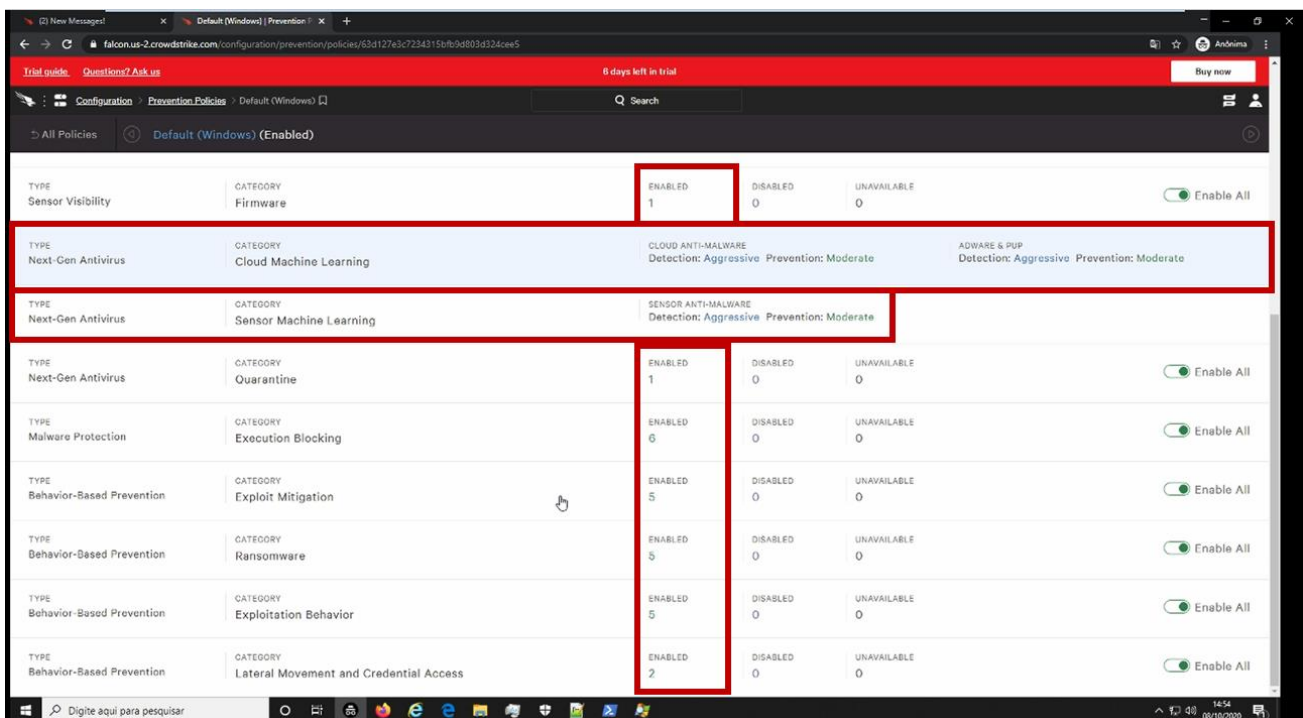


Image 1.2: Virtual Machine with Policy applied

The policy used was named **Default (Windows)**, following the best practices recommended by the manufacturer, and, for testing purposes, all due actions were based on an aggressive detection method.



TYPE	CATEGORY	CLOUD ANTI-MALWARE	ADWARE & PUP
Next-Gen Antivirus	Cloud Machine Learning	Detection: Aggressive Prevention: Moderate	Detection: Aggressive Prevention: Moderate
<b>Cloud Anti-malware</b> Use cloud-based machine learning informed by global analysis of executables to detect and prevent known malware for your online hosts. <a href="#">About levels</a>		<b>Adware &amp; PUP</b> Use cloud-based machine learning informed by global analysis of executables to detect and prevent adware and potentially unwanted programs (PUP) for your online hosts. <a href="#">About levels</a>	
	DISABLED CAUTIOUS MODERATE AGGRESSIVE EXTRA AGGRESSIVE	DISABLED CAUTIOUS MODERATE AGGRESSIVE EXTRA AGGRESSIVE	
Detection			
Prevention			

**Image 1.3: Policy Next-Gen Antivirus (Default Policy)**

One of the differences that we see with CrowdStrike is the non-use of Icon related of the binary.

**NOTE:** Falcon keeps a low profile and does not show a Windows system tray icon or Application in Mac. You can ensure that your newly installed sensor is running and has connected to the cloud via the Falcon interface.

### 3 Verify Registered AV

**i** Within Windows, you can verify that Falcon Prevent is the active anti-virus product for the system.

- ✦ Locate the Security and Maintenance section of the Windows Control Panel.
- ✦ Depending on your version of Windows, it may be easiest to search for Security and maintenance.
- ✦ Review the Security Section. You may need to dismiss existing notifications and/or expand the Security Section in order to locate the Virus protection section.
- ✦ Confirm that CrowdStrike Falcon is listed under Virus protection.

**NOTE:** This step does not apply to Windows Server installations. Windows Server does not feature a control panel module that shows virus protection status.

**Image 1.4: Installation binary information**

### 3.2 First Test

The first stage of the tests was through the download of 33 folders with many different kind of malwares, all of which are already known to be older, all of them are in the public repository known and maintained by the security community called **The Zoo** (<https://github.com/ytisf/theZoo/tree/master/malwares/Binaries>);

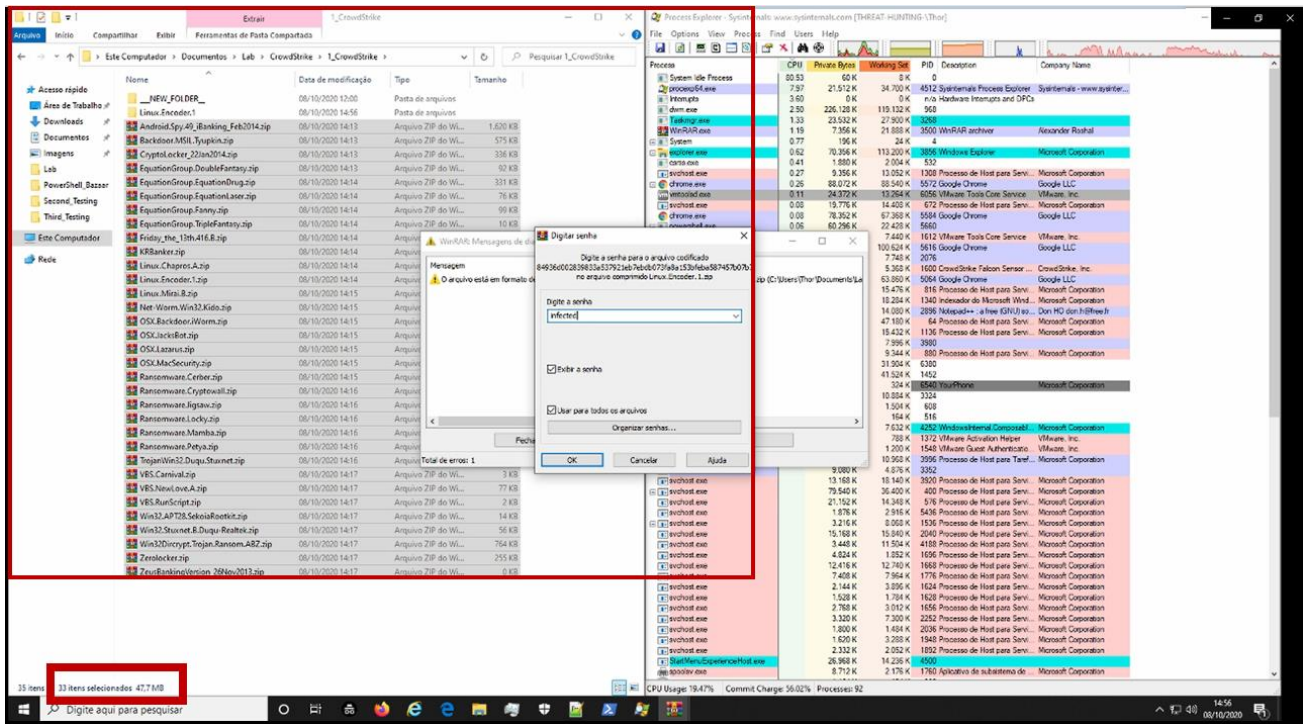


Image 1.4: Download 33 Folders with malicious files

The purpose of this test was to simulate the same process as a user receiving a zipped file (.zip) and performing the extraction of these artifacts in their own environment.

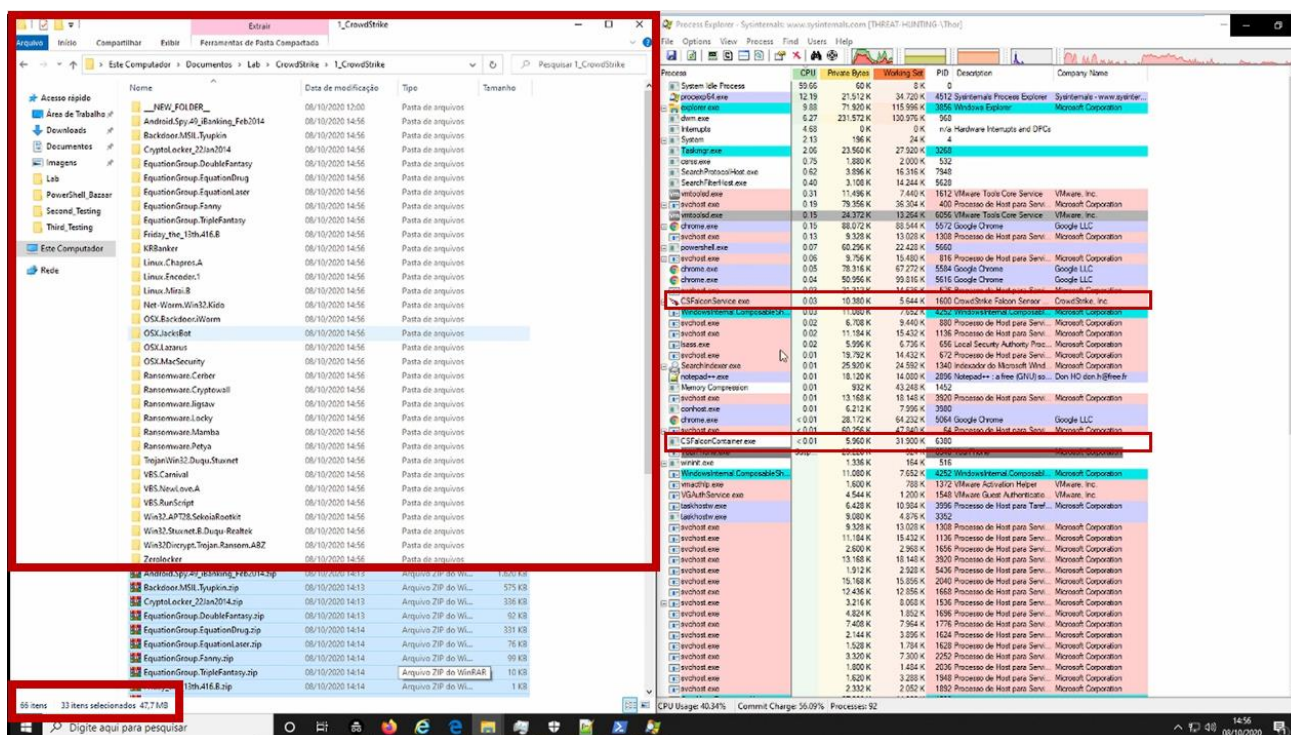


Image 1.5: Extraction of 33 Folders with malicious files

After performing the action of extracting the files, it was possible to verify that CrowdStrike Security Endpoint there were didn't detect any malware when it was downloaded to the victim machine, that if executed inside the environment, could perform an infection.

All those malwares are known and should be detected by signature, but they didn't.

**Regarding some with the vendor CrowdStrike doesn't work based on signature, this is one of the reasons, low consumption of computational resources**

Machine learning (ML) is used for pre-execution prevention. Falcon Host employs sophisticated machine learning algorithms that can analyze millions of file characteristics to determine if a file is malicious. **This signature-less technology enables Falcon Host to detect and block both known and unknown malware.** CrowdStrike ML technology has been independently tested and furthermore, it was provided to VirusTotal to contribute to the security community for the benefit of all. For more information about CrowdStrike ML, read the blog, "CrowdStrike Machine Learning and VirusTotal."

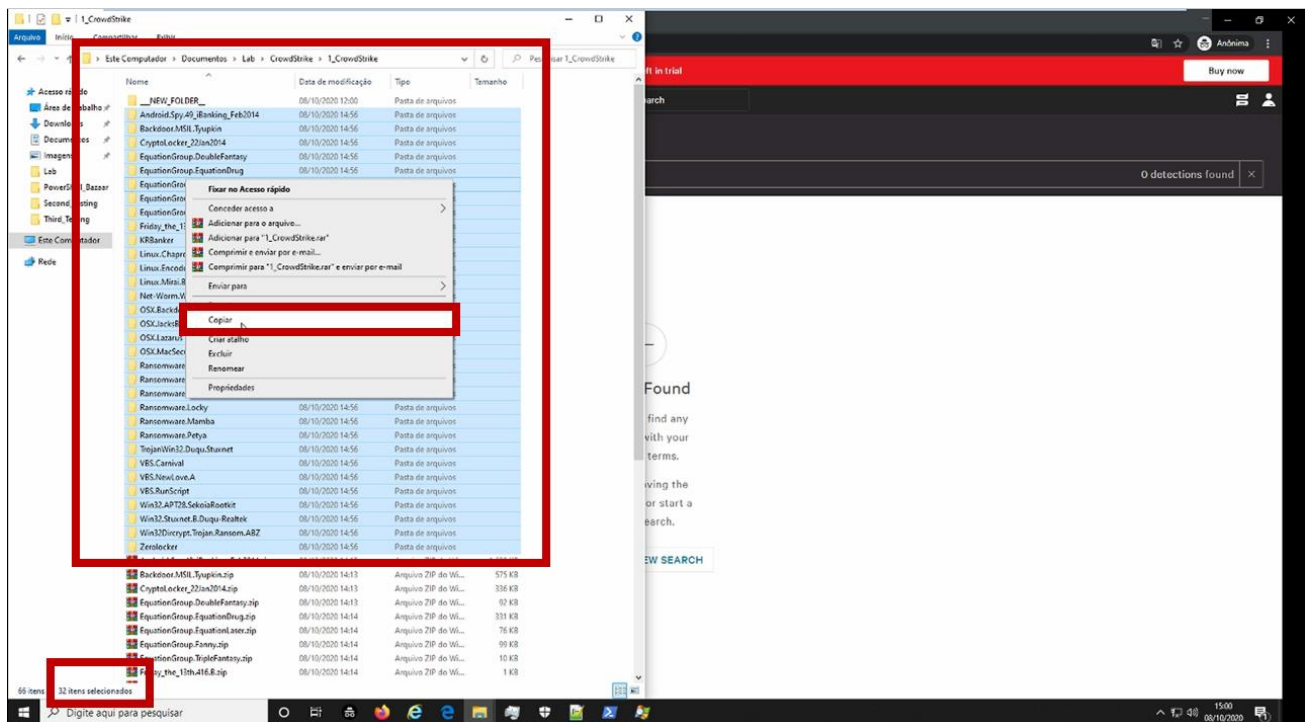
Reference: <https://www.crowdstrike.com/resources/data-sheets/preventing-malware-beyond/>

Other References: <https://www.crowdstrike.com/press-releases/crowdstrikes-machine-learning-engine-becomes-first-signature-less-engine-integrated-virustotal/>

### 3.3 Second Test

The second stage of the tests was through the transfer of folders to another directory within the same machine, the purpose of this test was to simulate a transfer of files within the same environment.





**Image 1.7:** \_\_\_NEW\_FOLDER\_\_\_(CrowdStrike) – Malware manipulation

When a new file is generated on the disk, soon we should have a new entry in a block of that disk and in theory the antivirus should take some action (considering that it has the real time enabled), we could define it as a file manipulation (still not running) where the endpoint protection is already necessary, considering that a new directory was created, soon we would have a new repository with several hashes inside to be examined..

After performing this second test, we saw that the same 32 folders with malwares there were detected yet, as we can see below and mentioned earlier, all these malware were already known and validated even in the tool about antivirus scanning known as a Virus Total (<https://virustotal.com>).

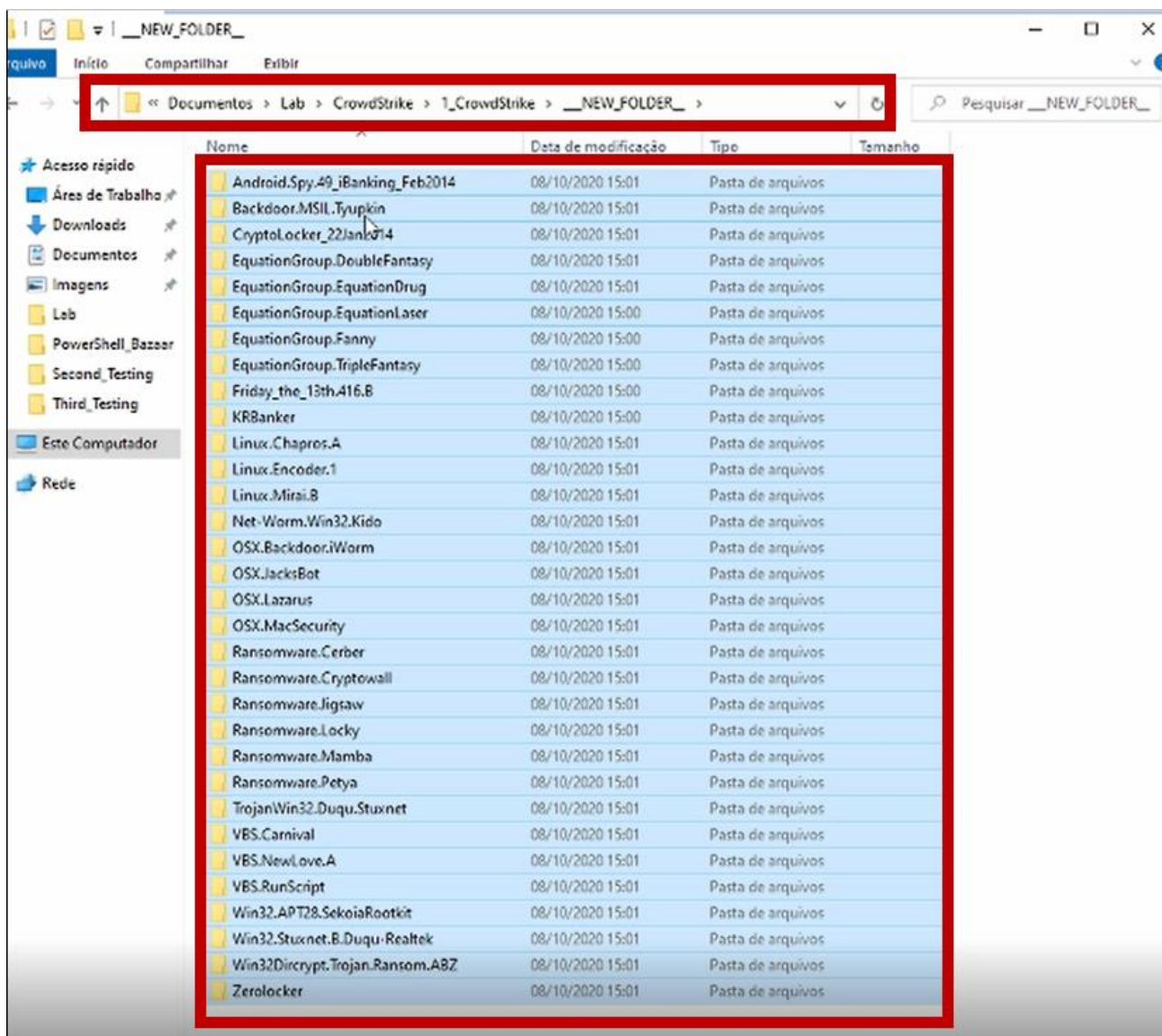


Image 1.8: Malwares – Not Detected

### 3.4 Third Test

The third stage of the tests was through the use of the *FULLSCAN* action by Cloud CrowdStrike, to perform a complete scan on the machine, manually, in this way, all malware should be eliminated, as they are already known malware as mentioned earlier, but in this case, we can't do this test, i.e., *CrowdStrike has a scanless technology*.

*Spotlight utilizes scanless technology, delivering an always-on, automated vulnerability management solution with prioritized data in real time. It eliminates bulky, dated reports with its fast, intuitive dashboard.*

Reference: <https://www.crowdstrike.com/endpoint-security-products/falcon-spotlight-vulnerability-management/>

**All surprises forced us to perform an unscheduled test for this stage.**

### 3.4 Fourth Test

The fourth stage of the tests (**unscheduled**) using “*Malware Execution*” manually, in this way, we can look the behavior of these detection engine works in real-time and all malware should be eliminated, as they are already known malware as mentioned earlier.

First of all, we executed the snapshot in our lab machine.

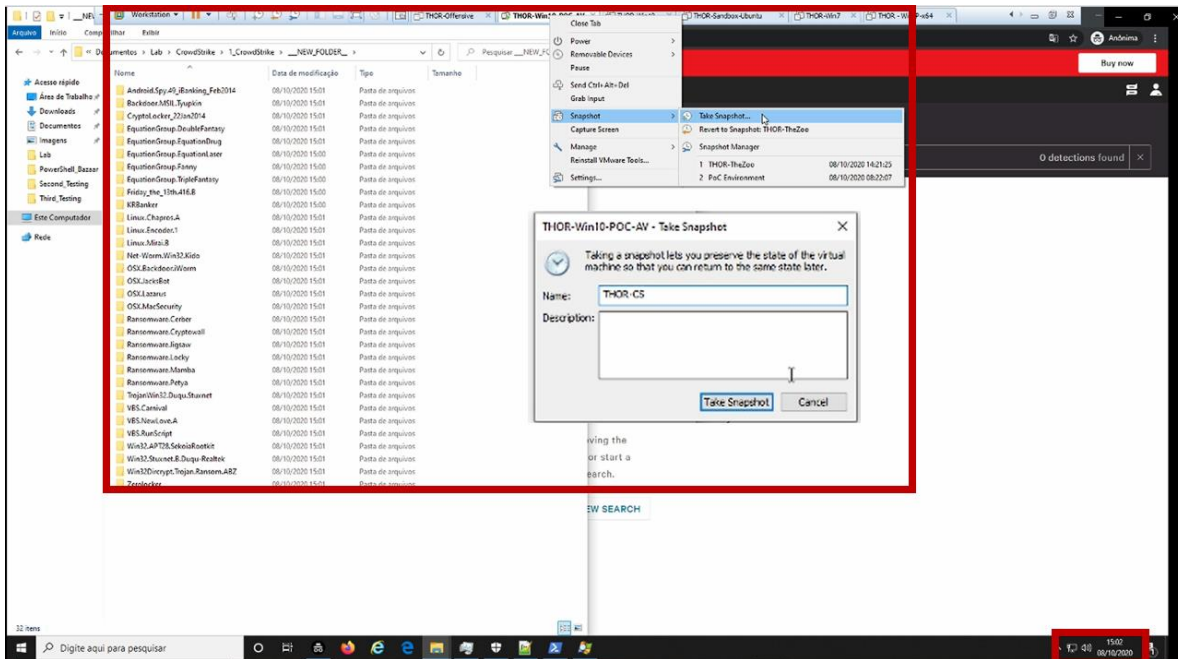


Image 1.9: Snapshot

We started the manual execution of some malware chosen at random.

First malware chosen was **Ransomware known as Cerber** and It was **BLOCKED**

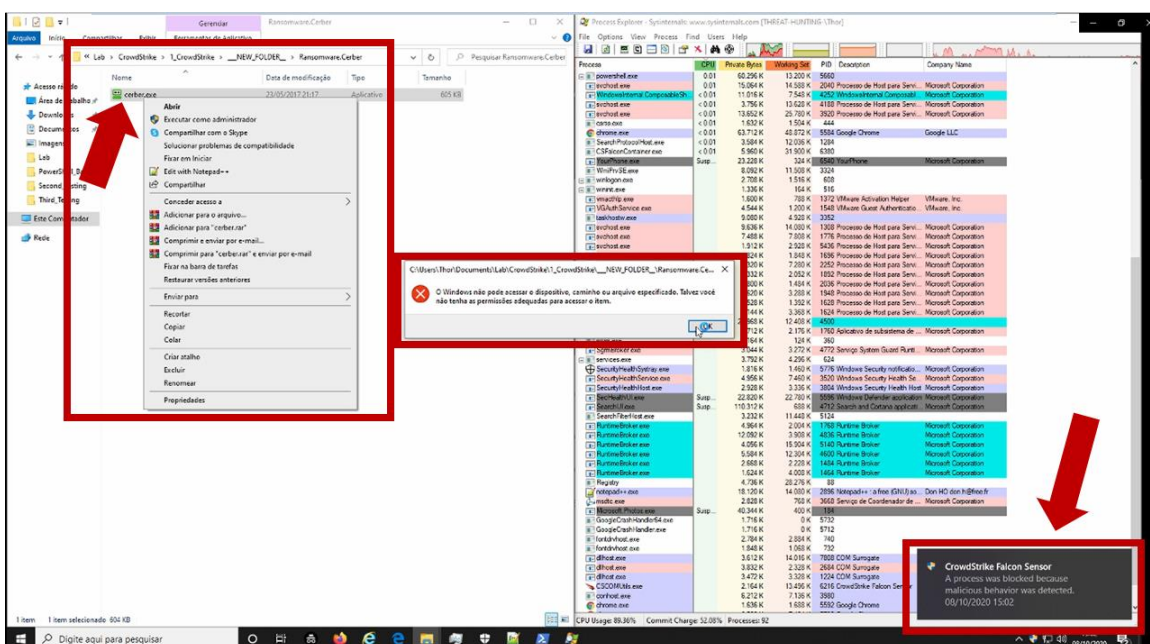


Image 1.10: Ransomware Cerber - BLOCKED



Second malware chosen was **Ransomware known as Cryptowall** and It was **BLOCKED**

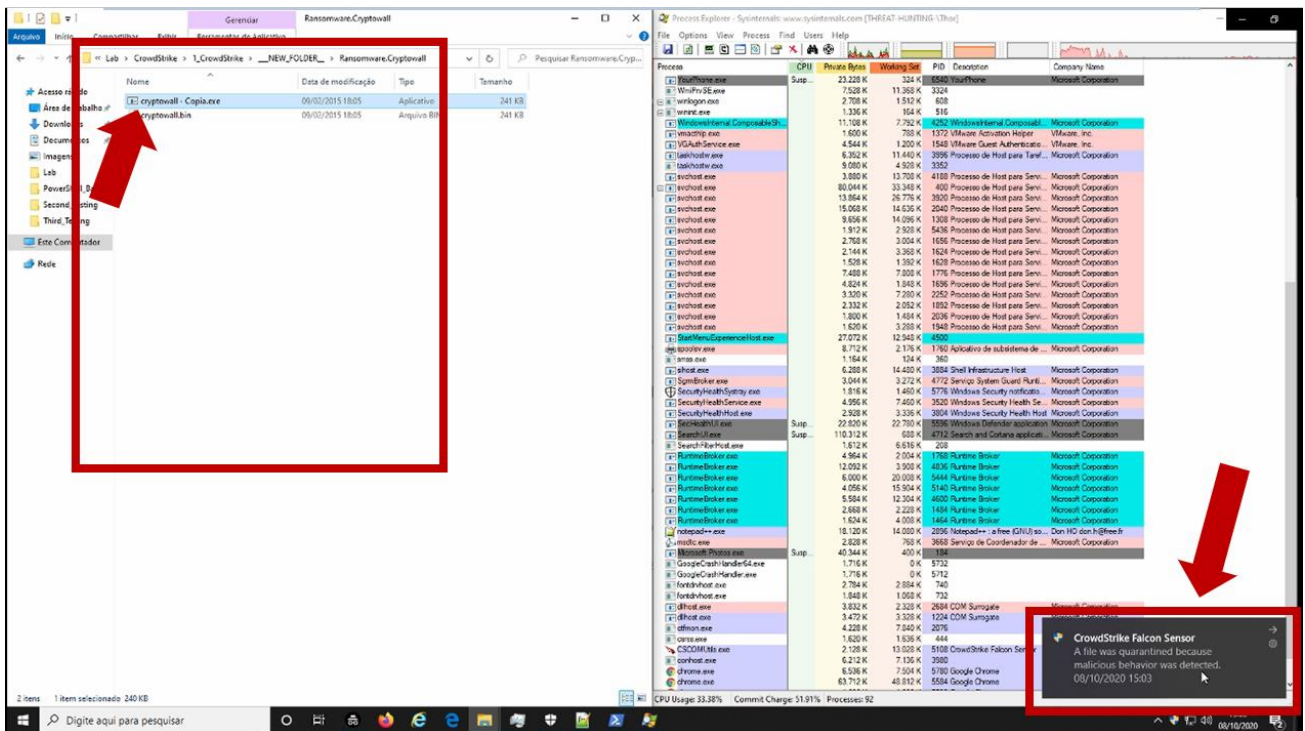


Image 1.11: Ransomware Cryptowall - BLOCKED

Third malware chosen was **Ransomware known as Mamba** and It was **BLOCKED**

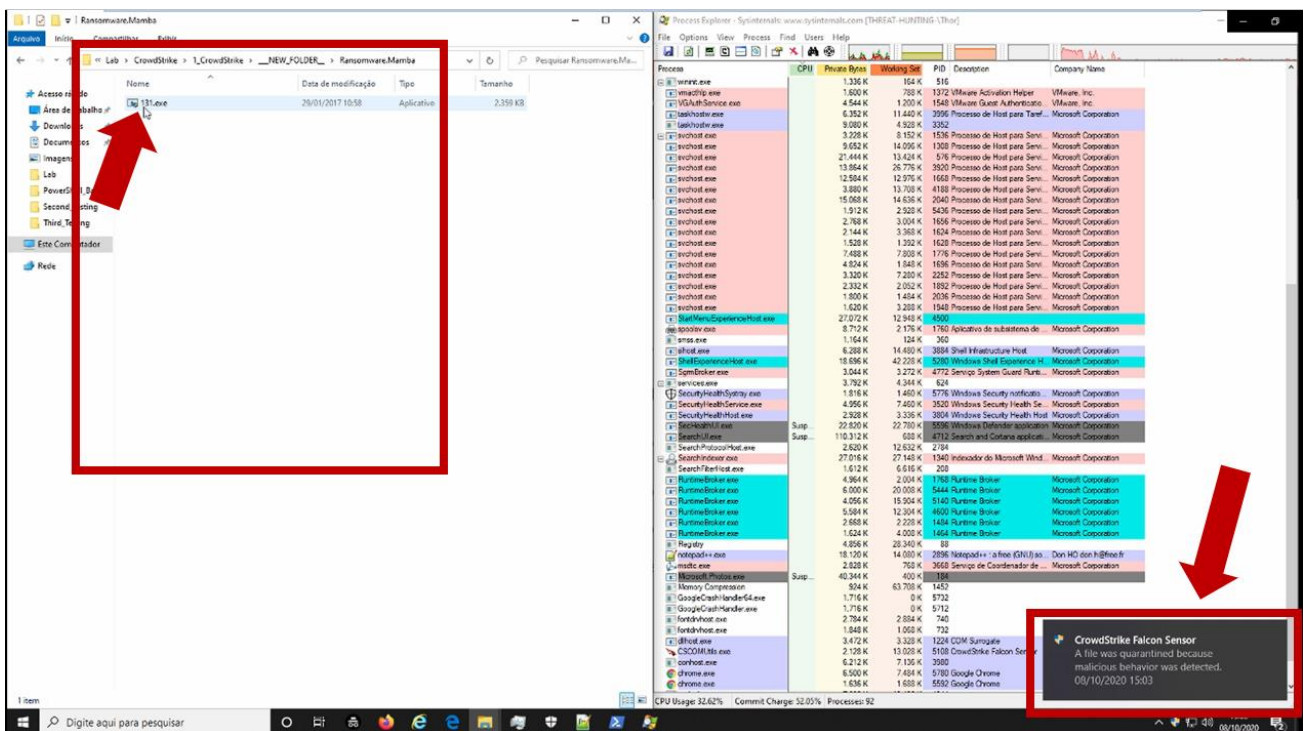
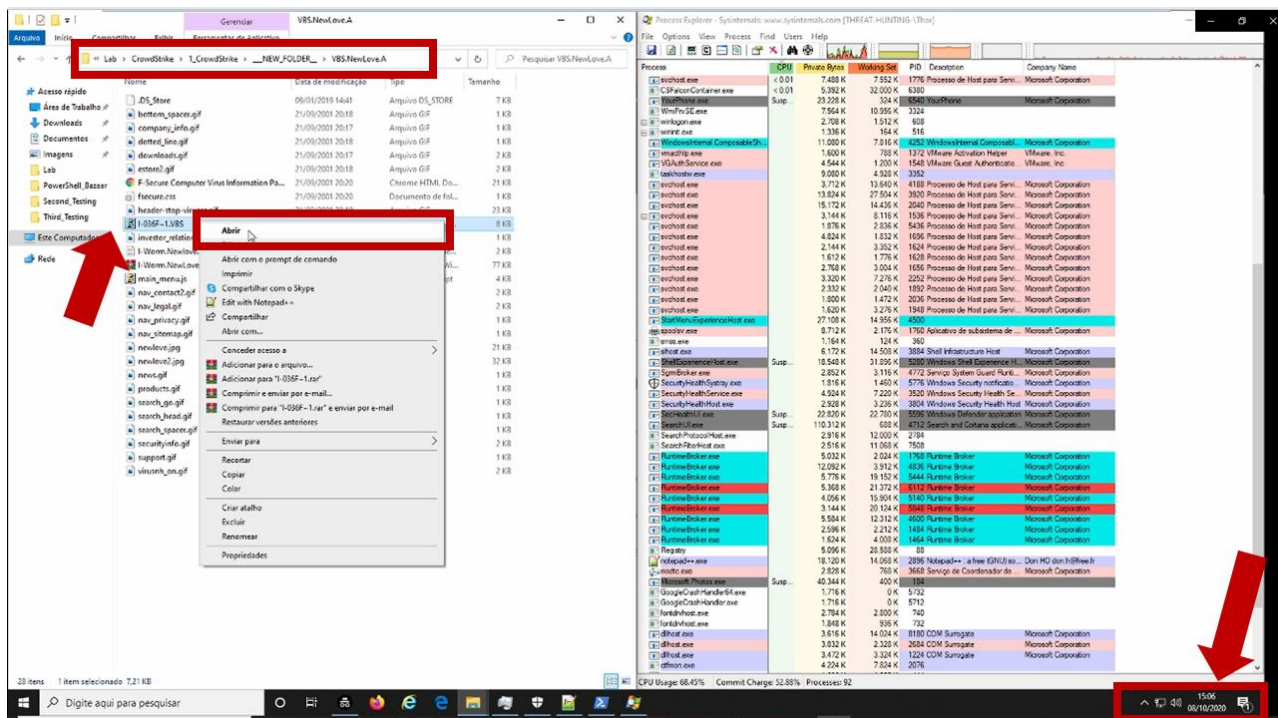


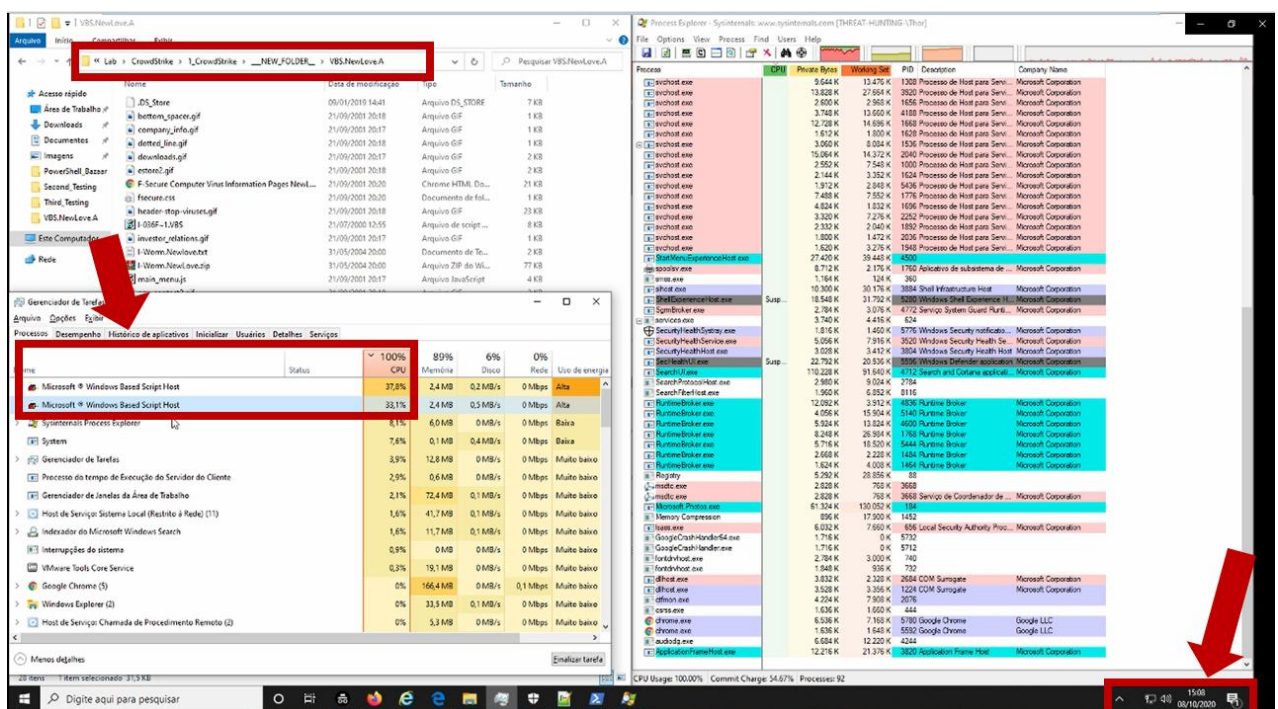
Image 1.12: Ransomware Cryptowall - BLOCKED

After two more test using PE (Portable Executable) file, and all those files were blocked, we tried to execute a VBS file, i.e, it's a **Virtual Basic script** written in the VBScript scripting language. It contains code that can be executed within Windows or Internet Explorer, via the Windows-based script host (Wscript.exe), to perform certain admin and processing functions.



**Image 1.13: VBS Script Executed**

After 2 minutes we can see that Windows-based script host (Wscript.exe) being executed in our machine, and not being blocked by CrowdStrike.



**Image 1.14:** VBS Script executing wscript.exe process



After some seconds we can see an alert with the message in Portuguese:

“You have files waiting to be recorded to disc” as you can see below.

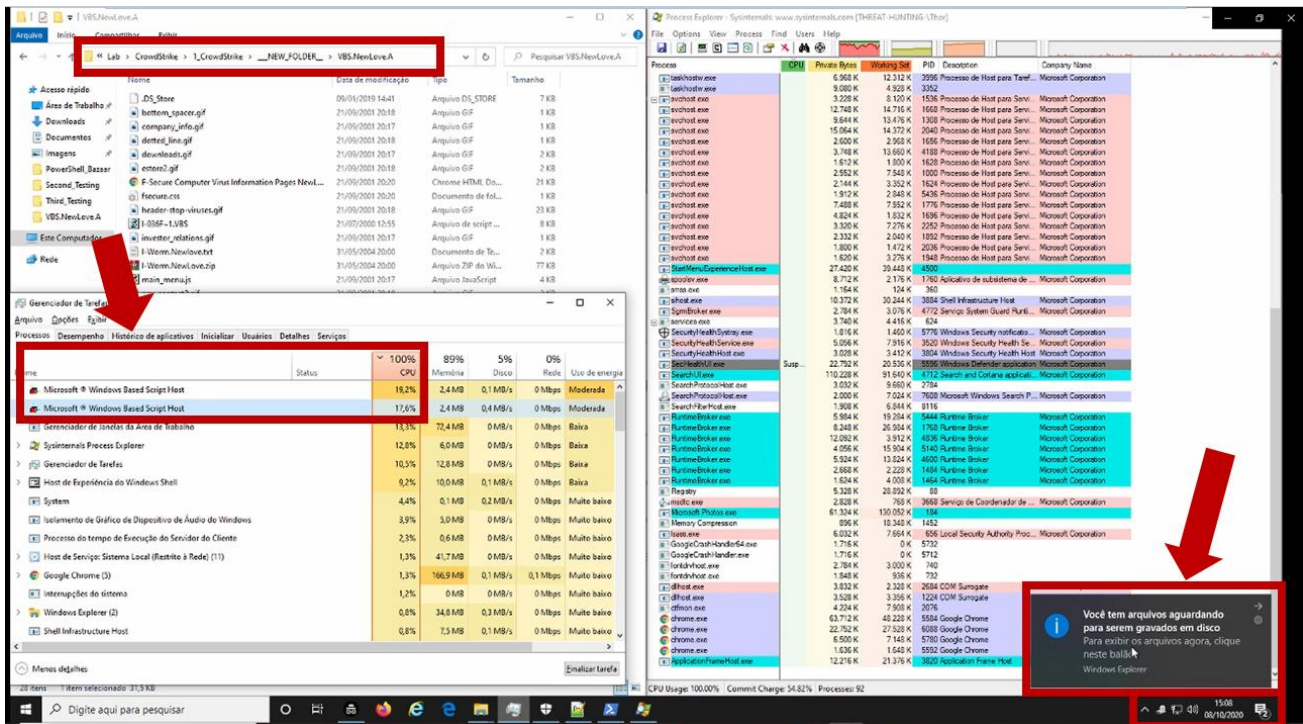


Image 1.15: Alert box “You have files waiting to be recorded to disc”

When this alert it’s open, we can see that exist a ISO media on our machine, we see many files in this ISO to be performed, and we can find the *desktop.ini.Vbs.Vbs* as a file done to be executed.

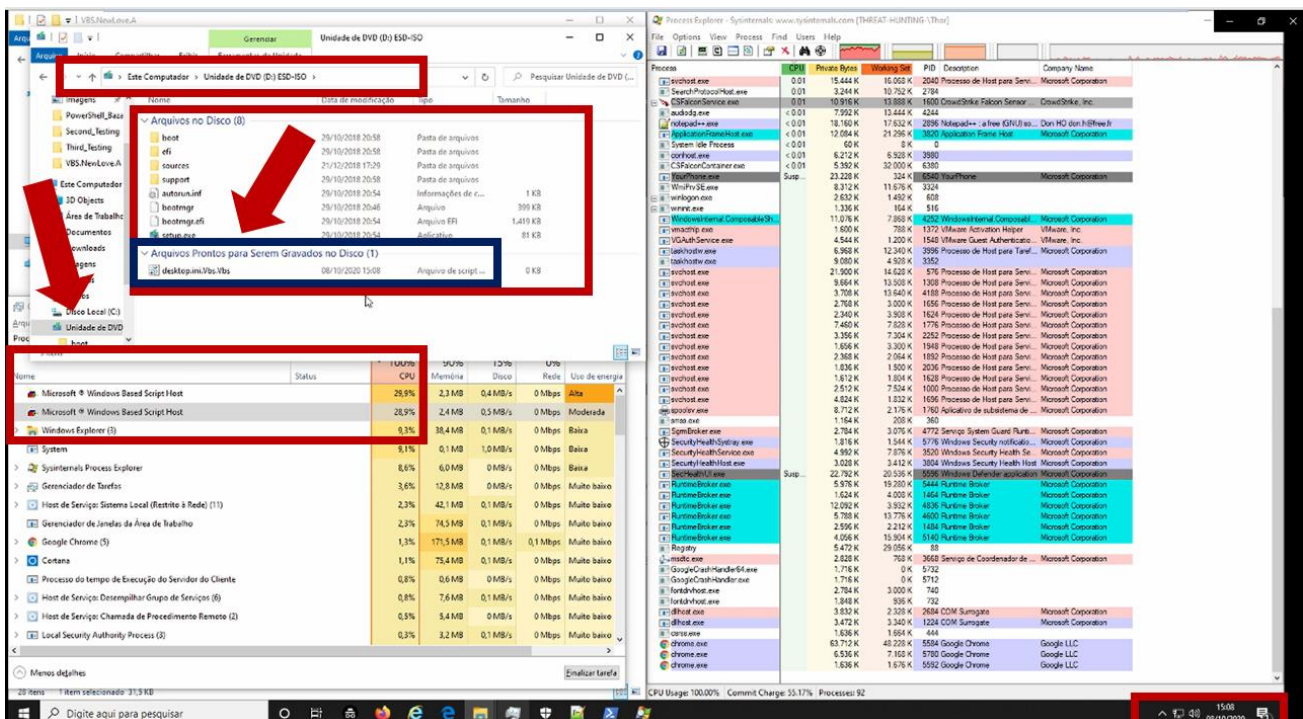


Image 1.16: Alert box “You have files waiting to be recorded to disc”

After 4 min after it is possible to see an infection inside the our “victim” machine, all those file were change to extension .Vbs as we see in the ISO media.

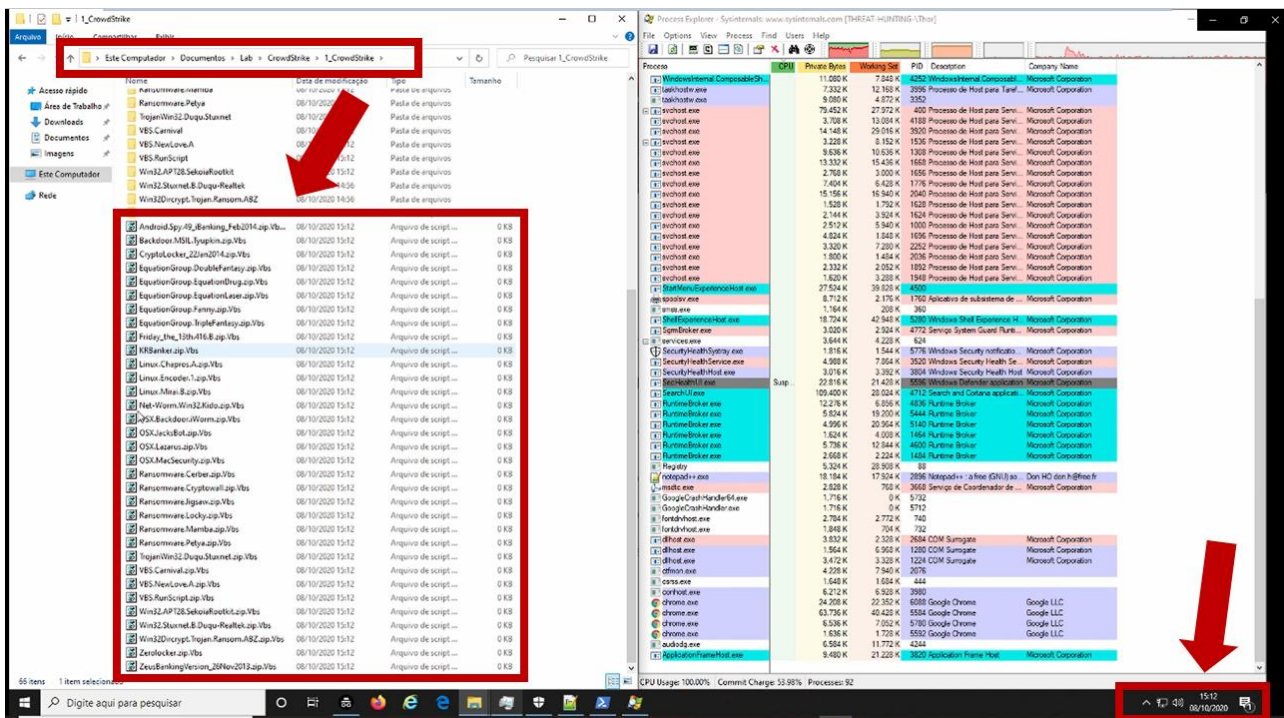


Image 1.17: Infection Happening

As we can see below, this malware is associated with the execution of VBS - Visual Basic Script and he change all extension in the victim environment.

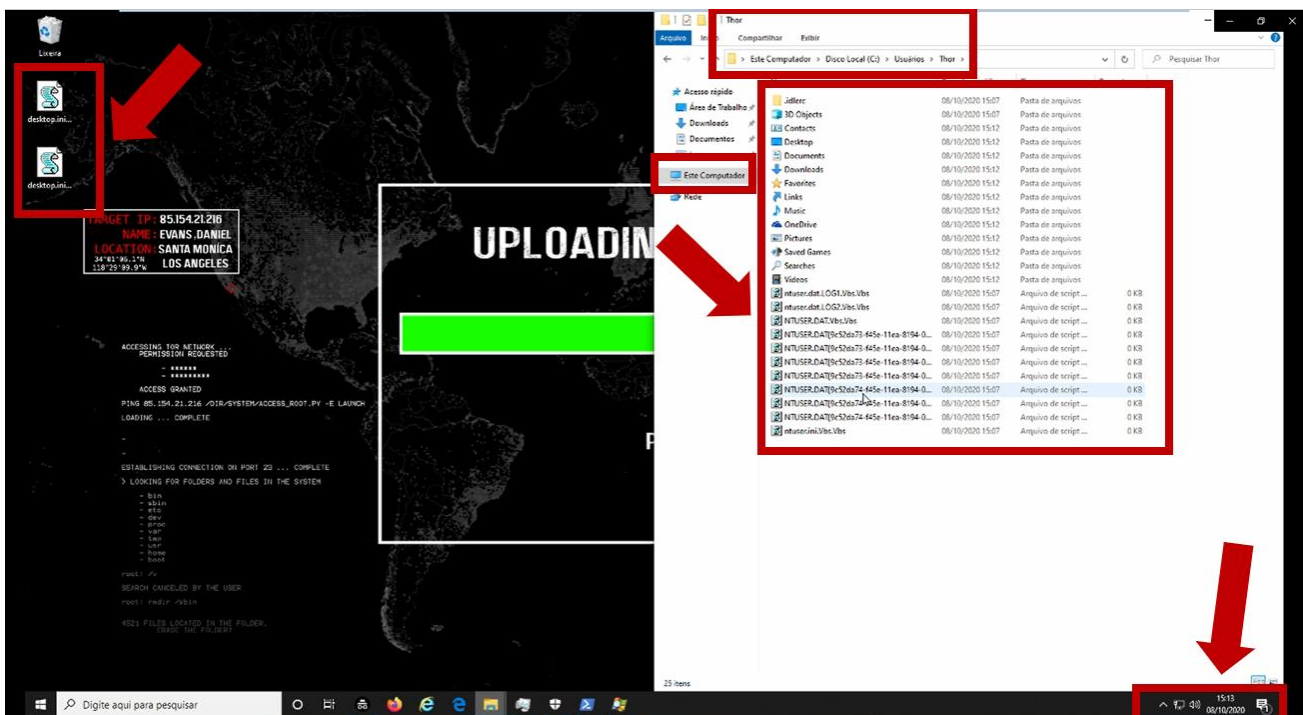


Image 1.18: Infection complete.

## 4 Impact

At the end of this test, it was possible to verify that there many malwares that, when executed inside the environment, may perform an infection.

- **CrowdStrike didn't work with Signature based;**
  - Which makes our environment very vulnerable;
- **Dependency of the real time engines;**
  - Which may be a risk as noted in our test;
- **After the first extraction, no one know malware were detected;**
  - When it comes a major malware infection we can have several types of attack vectors, so it is very important we have an efficient detection.
- **Malicious EXE files Not Detected**
  - PE files not detected even though malicious; it was not detected.
- **Malicious ELF files Not Detected**
  - *ELF* file not detected even though malicious; In our test environment, wouldn't be dangerous, because our environment it was Windows, but should be block but it was not detected.
- **After second test no one know malware were detected;**
  - After this moviment, no one malware it was detected.
- **Infection based on VBS ( Virtual Basic Script) – Known Malware**
  - This is the big surprise.
- **I-Worm.NewLove (Source)**

`hxxps://github.com/ytisf/theZoo/tree/master/malwares/Binaries/VBS.NewLove.`  
A

### Basic Properties

```
MD5      95f4156f23d61b1b888d3b3bb87b6d72
SHA-1    09d2470d17821728cd1da95186f5f51272634287
SHA-256  2246a1a31f8ef272a8ac44c97d383d0607d86ddf4509a176b157853d9c6e0028
Vhash    773a411c5a56087d4d7c5cc36bbf2901
```



SSDEEP

1536:cFy1wBDtr94PLDcwZANv1pG1ZuQK100ksk/L1xVCXJW5C6U7EjSRVve0:R1wBJoL4F1w6QK1qFnVCXJYCF7a0

Names

I-Worm.NewLove.zip  
output.149790737.txt;

Worm-type malware, with high criticality, associated with the execution of VBS - Visual Basic Script, we have as a characteristic high propagation within the environment in which it is executed.

The screenshot displays the VirusTotal Graph interface. The main window shows a graph titled "Untitled graph" by Filipi\_Pires. The graph area contains a single node, a blue square, which is highlighted. A tooltip window is open over this node, displaying the following information:

- Basic Properties:**
  - Type: VBA
  - Size: 7.22 kB
  - First Seen: 2009-06-08 19:14:56
  - Last Seen: 2019-09-12 10:13:00
  - Submissions: 26
  - File Name: d2b8ea4a267c69040c7d3ad80f64f8ba\_I-036F~1.VBS
- Detections:**
  - ZoneAlarm: Email-Worm.VBS.Newlove
  - Zillya: Worm.Newlove.VBS.1
  - Yandex: VBS.Spammer.A
  - ViRobot: VBS.NewLove.A
  - VIPRE: Email-Worm.VBS.Generic.a (v)
  - ... and 70 items more

The left sidebar of the interface shows the "Basic Properties" and "Detections" sections. The "Detections" section lists the same detection results as the tooltip. The bottom of the screen shows the Windows taskbar with the search bar and various application icons.

Image 1.19: I-Worm.NewLove – VirusTotal

## 5 Corrective Actions

As we mentioned before, the idea it was execute test in many malwares, and this case, for this reason to be totally known the following actions will be taken to improve the protection environment of our assets:

- This report will be sent to CrowdStrike Team to validate with them how the detection flow for known malware works, and why this **VBS/Malware didn't was detect;**
- Validate the performance of NGAV, Machine Learning and other components, regarding this type of detection;
- The best practices of the configurations will be revalidated with the CrowdStrike team;