Investigate a suspicious file hash

Scenario

You are a financial services company's level one security operations center (SOC) analyst. You have received an alert about a suspicious file being downloaded on an employee's computer.

You investigate this alert and discover that the employee received an email containing an attachment. The attachment was a password-protected spreadsheet file. The spreadsheet's password was provided in the email. The employee downloaded the file and then entered the password to open the file. When the employee opened the file, a malicious payload was then executed on their computer.

You retrieve the malicious file and create a SHA256 hash of the file. You might recall from a previous course that a hash function is an algorithm that produces a code that can't be decrypted. Hashing is a cryptographic method used to uniquely identify malware, acting as the file's unique fingerprint.

Now that you have the file hash, you will use VirusTotal to uncover additional IoCs that are associated with the file.

Step 1: Review the details of the alert

The following information contains details about the alert to help you complete this activity. The details include a file hash and a timeline of the event. Keep these details for reference as you proceed to the next steps.

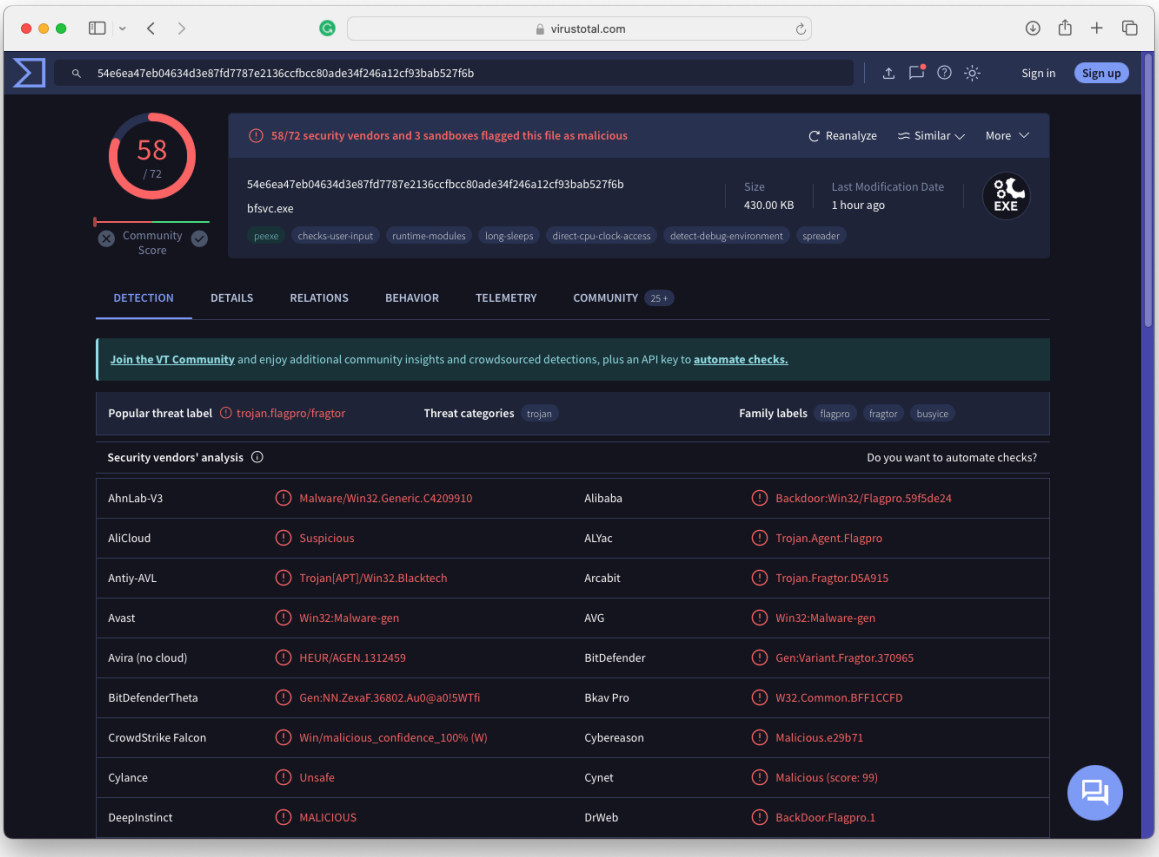
SHA256 file hash: 54e6ea47eb04634d3e87fd7787e2136ccfbcc80ade34f246a12cf93bab527f6b

Here is a timeline of the events leading up to this alert:

- 1:11 p.m.: An employee receives an email containing a file attachment.
- 1:13 p.m.: The employee successfully downloads and opens the file.
- 1:15 p.m.: Multiple unauthorized executable files are created on the employee's computer.
- 1:20 p.m.: An intrusion detection system detects the executable files and sends out an alert to the SOC.

Step 2: Enter the file hash into VirusTotal

Go to the VirusTotal website. Click SEARCH, enter the SHA256 file hash in the search box, and press enter.



Once we've retrieved VirusTotal's report on the file hash, take some time to examine the report details. We can start by exploring the following tabs:

1. Detection: This tab provides a list of third-party security vendors and their detection verdicts on an artifact. Detection verdicts include: malicious, suspicious, unsafe, and others. Notice how many security vendors have reported this hash as malicious and how many have not.
2. Details: This tab provides additional information extracted from a static analysis of the IoC. Notice the additional hashes associated with this malware like MD5, SHA-1, and more.
3. Relations: This tab contains information about the network connections this malware has made with URLs, domain names, and IP addresses. The Detections column indicates how many vendors have flagged the URL or IP address as malicious.
4. Behavior: This tab contains information related to the observed activity and behaviors of an artifact after executing it in a controlled environment, such as a sandboxed environment. A sandboxed environment is an isolated environment that allows a file to be executed and observed by analysts and researchers. Information about the malware's behavioral patterns is provided through sandbox reports. Sandbox reports include information about the specific actions the file takes when it's executed in a sandboxed environment, such as registry and file system actions, processes, and more. Notice the different types of tactics and techniques used by this malware and the files it created.

Pro tip: Sandbox reports are useful in understanding the behavior of a file, but they might contain information that is not relevant to the analysis of the file. By default, VirusTotal shows all sandbox reports in the Behavior tab. You can select individual sandbox reports to view. This is helpful because you can

view the similarities and differences between reports so that it's easier to identify which behaviors are likely to be associated with the file.

Step 3: Fill in the report with additional indicators of compromise

After we've explored the sections in the VirusTotal report, we will uncover additional IoCs that are associated with the file according to the VirusTotal report.

We'll identify indicators of compromise (IoCs) that are associated with this file hash using the tabs in the VirusTotal report. Then, enter the IoCs into their respective sections in the Pyramid of Pain template.

Indicators of compromise are valuable sources of information for security professionals because they are used to identify malicious activity. We can choose to identify the six types of IoCs found in the Pyramid of Pain:

- Hash value: Hashes convert information into a unique value that can't be decrypted. Hashes are often used as unique references to files involved in an intrusion. In this activity, you used a SHA256 hash as the artifact for this investigation. Find another hash used to identify this malware and enter it beside the Hash values section in the Pyramid of Pain template. You can use the Details tab to help you identify other hashes.
- IP address: Find an IP address that this malware contacted and enter it beside the IP addresses section in the Pyramid of Pain template. You can locate IP addresses in the Relations tab under the Contacted IP addresses section or in the Behavior tab under the IP Traffic section.
- Domain name: Find a domain name that this malware contacted and enter it beside the Domain names section in the Pyramid of Pain template. You can find domain name information under the Relations tab. You might encounter benign domain names. Use the Detections column to identify domain names that have been reported as malicious.
- Network artifact/host artifact: Malware can create network-related or host-related artifacts on an infected system. Find a network-related or host-related artifact that this malware created and enter it beside the Network/host artifacts section in the Pyramid of Pain template. You can find this information from the sandbox reports under the Behavior tab or from the Relations tab.
- Tools: Attackers can use tools to achieve their goals. Try to find out if this malware has used any tool. Then, enter it beside the Tools section in the Pyramid of Pain template.
- Tactics, techniques, and procedures (TTPs): TTPs describe the behavior of an attacker. Using the sandbox reports from the Behavior tab, find the list of tactics and techniques used by this malware as identified by MITRE ATT&CK® and enter it beside the TTPs section in the Pyramid of Pain template.

Note: VirusTotal reports can contain legitimate domains and IP addresses that are not considered malicious.

Pro tip: To learn more about a section in VirusTotal, hover your cursor over the information icon to display information on what that section includes.