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Lab - Identify Relevant Threat Intelligence

Objectives

Part 1: Research MITRE CVEs

Part 2: Access the MITRE ATT&CK Knowledge Base

Part 3: Investigate Potential Malware

Background / Scenario

You have been hired as a Tier 1 Cybersecurity Analyst by XYZ, Inc. Tier 1 analysts typically are responsible for responding to incoming tickets and security alerts. In this lab, you will conduct threat intelligence research for several scenarios that have impacted XYZ, Inc. Each scenario will require you to access threat intelligence websites and answer questions regarding the threat encountered in the scenario.

Required Resources

- 1 PC with internet access

Instructions

Part 1: Research MITRE CVEs

The MITRE organization created the Common Vulnerabilities and Exposures (CVE) database in 1999 to identify, define, and catalog publicly disclosed cybersecurity vulnerabilities. It was endorsed by the National Institute of Standards and Technology (NIST) in 2002. The CVE database is now the standard method of registering and identifying vulnerabilities.

In this part, you will research the CVE program and use the CVE list to identify threats.

Step 1: Research the CVE website.

Go to **https://cve.mitre.org** and navigate to the **About** > **Terminology** page to answer the following questions.

Questions:

What is the **CVE Program**?

Answer Area

The CVE Program is a global, community-based effort aimed at identifying and documenting vulnerabilities by following specific rules and guidelines set by the program.

The CVE program is an international, community-driven effort to catalog vulnerabilities in accordance with the effort’s rules and guidelines.

What is a CVE Numbering Authority (CNA)?

Answer Area

A CNA is an entity responsible for assigning CVE IDs to identified vulnerabilities and for preparing and publishing information about those vulnerabilities in the CVE Record. Each CNA has a defined scope of responsibility for identifying and reporting vulnerabilities.

What is an Authorized Data Publisher (ADP)?

Answer Area

An ADP is an organization authorized within the CVE Program to add further information to a CVE Record already published by a CNA. This additional information may include risk scores (such as CVSS), as well as lists of affected products and versions.

What is the **CVE List**?

Answer Area

The CVE List is a searchable catalog that includes all CVE Records identified or reported to the CVE Program, serving as an archive of vulnerabilities.

What is a **CVE Record**?

Answer Area

A CVE Record is detailed data about a specific vulnerability associated with a CVE ID, gathered by a CNA and potentially enriched by an ADP. This data is available in formats readable by both humans and machines, with each CVE Record having a status of either Reserved, Published, or Rejected.

What is a **CVE ID**?

Answer Area

A CVE ID is a unique alphanumeric code provided by the CVE Program to identify a specific vulnerability. This identifier allows multiple parties to refer to the same vulnerability, facilitating accurate information sharing and correlation.

Step 2: Research CVEs at the Cisco Security Advisories website.

Many security sites and software refer to CVEs. For example, the cisco.com website provides Cisco Security Advisories identifying vulnerabilities associated with Cisco products. In this step, you will refer to this website to identify a CVE ID.

a. Leave the cve.mitre.org website open. In another browser tab, do an internet search for **Cisco Security Advisories** and click the link to go to the tools.cisco.com web page.

b. This page lists all the currently known CVEs. For the **Impact** column, click the down arrow and uncheck everything except **Critical**, and then click **Done**.

c. Choose one of the advisories and answer the following questions about your selected advisory.

Questions:

What is the name of the advisory that you chose?

Answer Area

For example, a listed vulnerability name in the first column might be "Cisco SD-WAN vManage Software Arbitrary File Overwrite Vulnerability."

What is the CVE ID? You will use this ID in the next step.

Answer Area

The CVE ID for this vulnerability can be found in the third column, for instance, "CVE-2022-20699."

d. You can either click the advisory to go to a details page or click the down arrow next to the advisory name to get more information.

Question:

Is there a **workaround** for the advisory you chose?

Answer Area

To determine if there is a workaround or mitigation for this vulnerability, you can either click on the advisory name or click the down arrow next to it for more details.

Step 3: Return to the CVE website and research more about your chosen Cisco CVE.

a. Navigate back to the website cve.mitre.org website, which should still be open in a browser tab.

b. Click **Search CVE List** to open up a search box.

c. In the search field, enter the CVE ID for the critical advisory you documented in the previous step. The CVE ID is in the following format: **CVE-[year]-[id_number]**.

Question:

Briefly describe the vulnerability.

Answer Area

For instance, **CVE-2022-20699** describes a vulnerability in the Cisco SD-WAN vManage software that could allow an authenticated, remote attacker to overwrite arbitrary files on the affected system. This vulnerability exists because of insufficient validation of user-supplied input. By exploiting this issue, an attacker could potentially gain unauthorized access to sensitive information or disrupt services. This description aligns with the details available on the Cisco Security Advisories website for the chosen advisory.

Part 2: Access the MITRE ATT&CK Knowledge Base

The MITRE Adversarial Tactics, Techniques & Common Knowledge (ATT&CK) Framework enables the ability to detect attacker tactics, techniques, and procedures (TTP) as part of threat defense and attack attribution. In this part, you will investigate the MITRE ATT&CK website to answer questions.

Step 1: Go to the MITRE ATT&CK website.

Navigate to the **https://attack.mitre.org** website.

The page displays an attack matrix for enterprises which identifies various tactics and the techniques used by threat actors. **Tactics** are the header column titles (e.g., **Reconnaissance**, **Resource Developments**, etc.) with **Techniques** listed below. A short phrase for each technique summarizes what a threat actor could do to execute an attack. Clicking the linked phrase will take you to a page for detailed information about the techniques and methods for mitigation.

Note: You may need to expand the width of your browser window to see all 14 tactics. Alternatively, you can hold down the **Shift** key and scroll your mouse wheel to shift the window left and right.

This matrix is an excellent place to come to learn more about different tactics and techniques threat actors use to compromise systems. Cybersecurity analysts regularly visit this site to research specific attacks and possible mitigations.

Step 2: Investigate the Reconnaissance tactic and the Phishing for Information tactic.

Use the MITRE ATT&CK page to answer the following questions.

Questions:

How many techniques are attributed to the **Reconnaissance** tactic?

Answer Area

The number of techniques under Reconnaissance may vary, but as of the latest review, there are approximately 10 techniques listed.

Under **Reconnaissance**, click **Phishing for Information** and read the description. Briefly describe how a threat actor could gather reconnaissance information using phishing techniques?

Answer Area

Threat actors may use phishing messages to deceive individuals into sharing confidential information, which can aid in further targeting. Phishing leverages social engineering tactics and can be crafted specifically for certain individuals or organizations, known as spearphishing, to increase the likelihood of success.

Expand the dropdown menu under the **Phishing for Information** header or refer to the menu on the left. What are sub-techniques used when phishing for information?

Answer Area

The sub-techniques include **Spearphishing via Service**, **Spearphishing Attachment**, and **Spearphishing Link**.

What steps could you take to mitigate these techniques?

Answer Area

Implementing email filtering mechanisms, such as anti-spoofing and email authentication, along with regular user training to recognize phishing attempts, are effective measures to reduce the risk of phishing-based reconnaissance.

Step 3: Investigate the Command and Control tactic and Data Encoding technique.

Use the MITRE ATT&CK page to answer the following questions.

Note: **Command and Control** is the 12th tactic in the matrix. You may need to expand the width of your browser window to see it. Alternatively, you can hold down the **Shift** key and scroll your mouse wheel to shift the window left and right.

Questions:

How many techniques are attributed to the **Command and Control** tactic?

Answer Area

As of the latest information, there are around 16 techniques associated with the Command and Control tactic.

Under **Command and Control**, click **Data Encoding** and read the description. Briefly describe how a threat actor could use data encoding for command and control?

Answer Area

Type yo A threat actor might utilize data encoding to obfuscate the communication within command and control (C2) traffic, making it harder for security systems to detect. This can involve using encoding methods such as Base64 or hexadecimal, or compressing data using algorithms like gzip to disguise the true nature of the C2 messages.

What could you do to mitigate this technique?

Answer Area

To counteract these techniques, organizations can deploy network intrusion detection and prevention systems (IDS/IPS) that use specific network signatures and rules designed to recognize and flag suspicious traffic associated with known malware or adversary tactics. Additionally, maintaining up-to-date threat intelligence can help in identifying emerging C2 methods.

Step 4: Investigate the Impact Tactic

Use the MITRE ATT&CK page to answer the following questions.

Note: The **Impact** tactic is the last tactic on the far right of the matrix.

Questions:

How many techniques are attributed to the **Impact** tactic?

Answer Area

Currently, there are approximately 13 techniques listed under the Impact tactic.

Under **Impact**, click **Disk Wipe** and read the description. Briefly describe the impact if a threat actor does a disk wipe?

Answer Area

Type you When a threat actor executes a disk wipe, they can render critical data unrecoverable, severely disrupting the availability of systems and services. This type of attack can compromise operational continuity, as malware designed for disk wiping may also have the capability to spread throughout the network, affecting multiple systems.

What could you do to mitigate this technique?

Answer Area

To mitigate the risk of a disk wipe, organizations should implement a comprehensive IT disaster recovery plan that includes regular data backups. These backups should be securely stored off-site and protected from potential attacks, ensuring that recovery options are available even in the event of a successful attack on primary data storage. Additionally, regular testing of backup integrity and recovery procedures can further safeguard against data loss.

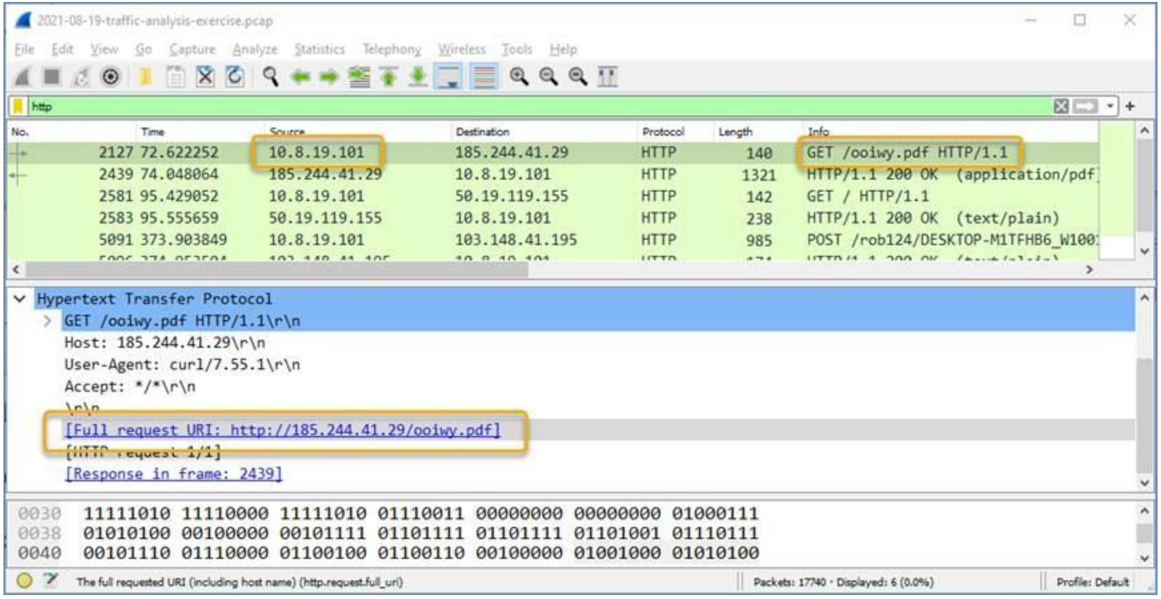
Part 3: Investigate Potential Malware

There are a number of tools that a cybersecurity analyst can use to validate malicious software. In this part, you will investigate an IPS alert to see if it is malicious software.

Step 1: Generate a SHA256 hash for a suspicious file.

As a Tier 1 Cybersecurity Analysts, you have access to a Security Information Event Management (SIEM) system on your Linux management station. The SIEM just sent you an IPS alert referencing a local IP address of 10.8.19.101. You decide to examine the actual traffic identified in the alert by pivoting to Wireshark.

a. As you scroll through the various packet captures of IP address 10.8.19.101, you notice that a file was downloaded by the host as shown in the figure.


2021-08-19-traffic-analysis-exercise.pcap
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

http

```
No.   Time          Source          Destination      Protocol  Length  Info
2127  72.622252     10.8.19.101     185.244.41.29    HTTP       140    GET /ooiwy.pdf HTTP/1.1
2439  74.048064     185.244.41.29   10.8.19.101      HTTP      1321    HTTP/1.1 200 OK  (application/pdf
2581  95.429052     10.8.19.101     50.19.119.155    HTTP       142    GET / HTTP/1.1
2583  95.555659     50.19.119.155   10.8.19.101      HTTP       238    HTTP/1.1 200 OK  (text/plain)
5091  373.903849    10.8.19.101     103.148.41.195   HTTP       985    POST /rob124/DESKTOP-M1TFHB6_W100
```

```
Hypertext Transfer Protocol
  GET /ooiwy.pdf HTTP/1.1\r\n
    Host: 185.244.41.29\r\n
    User-Agent: curl/7.55.1\r\n
    Accept: */*\r\n
    \r\n
    [Full request URI: http://185.244.41.29/ooiwy.pdf]
    [HTTP request 1/1]
    [Response in frame: 2439]
```

```
0030  11111010 11110000 11111010 01110011 00000000 00000000 01000111
0038  01010100 00100000 00101111 01101111 01101111 01101001 01110111
0040  00101110 01110000 01100100 01100110 00100000 01001000 01010100
```

The full requested URI (including host name) (http.request.full_uri) | Packets: 17740 · Displayed: 6 (0.0%) | Profile: Default

Blank Line, No additional information

b. You decide to export this file from Wireshark for malware analysis using the **File** > **Export Objects** > **HTTP** command and save the file with the name **ooiwy.pdf**.

c. Next you generate the SHA256 hash value of the saved file using the **sha256sum** command as shown.

```
[analyst@secOps ~]:~$ sha256sum ooiwy.pdf
f25a780095730701efac67e9d5b84bc289afea56d96d8aff8a44af69ae606404 ooiwy.pdf
```

Notice the SHA256 hash signature that was generated. This string can be validated in various file reputation sites to see if this the file is malware.

Step 2: Look up the hash at file reputation websites.

There are a number of file reputation sites that can be used to investigate this file. In this step, you will use Cisco's Talos website and virustotal.com.

a. Search for "Cisco Talos" and click the first link to access the Cisco Talos Intelligence Group website.

b. Locate the menus at the top and over the **Reputation Center** to dropdown a submenu. Click the link for the **Talos File Reputation** search page.

c. Copy the highlighted SHA hash value from the previous step and paste it into the search window. Click the “I’m not a robot” checkbox, and then click **Search**.

d. Review the information for this file.

Questions:

What is the Talos Weighted File Reputation Score? Is that good or bad?

Answer Area

The Talos Weighted File Reputation Score is rated on a scale from 1 to 100. If the score is 100, it indicates that the file is categorized as highly malicious, which is certainly bad and suggests a strong likelihood of being harmful.

e. Search for and navigate to the **VirusTotal** website.

f. Click **Search**, paste the SHA256 hash in the field, and then press **Enter**. The page displays all the security vendors that have identified this file as malicious (on the left) and the names this companies use to identify the malicious file.

g. Notice the column headings DETECTION, DETAILS, RELATIONS, BEHAVIOR, and COMMUNITY. Use the information on the DETAILs page to answer the following questions.

Questions:

When was this file created?

Answer Area

Creation Time 2021-07-06 13:28:40

What other names is the file known by other than **ooiwy.pdf**?

Answer Area

In addition to ooiwy.pdf, the file may also be identified by names such as **RegDemo.exe**, **RegistryDemo.exe**, **cdnupdaterapi.png**, and **ooiwy.pdf.exe**. These alternative names can help in recognizing and tracking the file across different security systems.

What is the target machine?

Answer Area

The target machine is identified as **Intel 386 or later processors and compatible processors**. This indicates that the file is designed to run on a range of Intel architecture systems that support the necessary operating environment for execution.