Old Dominion University
CYSE 450: Ethical Hacking and Penetration Testing

Lab 2: Passive Reconnaissance

Total Points: 30

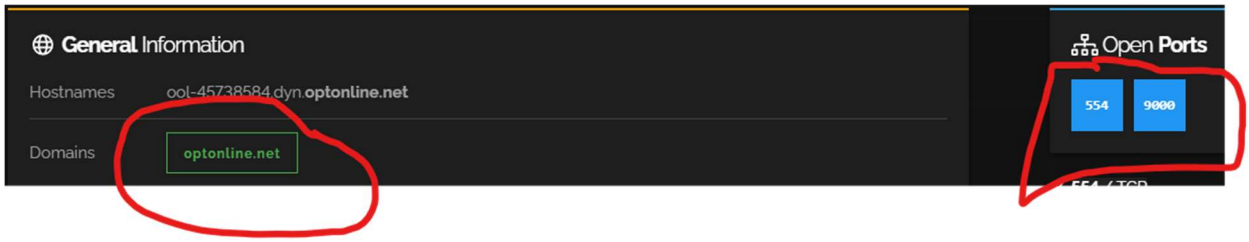
Question 1: Login to Shodan (https://www.shodan.io/) using your Gmail account or any other account you have created with the portal. Search ***Web Camera*** or ***Web Cam*** in the search bar, and you will be shown a report where a number of accessible web cameras are listed.

- **Task 1**: Find a device where there is at least one open port and the domain name (URL) is displayed. If you find multiple such devices, just choose one arbitrarily. Take a screenshot highlighting the domain name and the open ports. Attach the screenshot in your submission.

4 points

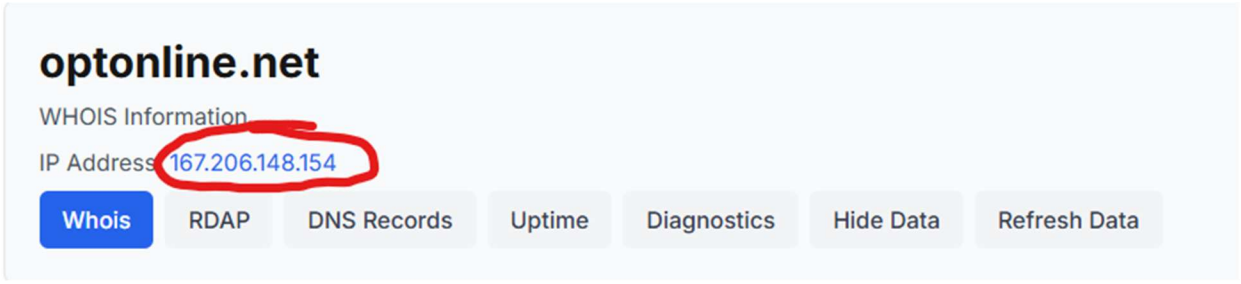
Domain name: optonline.net

Open ports: 554, 9000



- **Task 2**: Using WHOIS (https://who.is/) or Netcraft (https://sitereport.netcraft.com/), find the IP address of the domain name you found in Task 1. Take a screenshot highlighting the IP address and attach it in your submission. Go through the complete report you retrieved from WHOIS or Netcraft. Do some research online about the vulnerabilities or weakness the device has. Briefly describe all the security weakness or vulnerabilities you found.

6 points

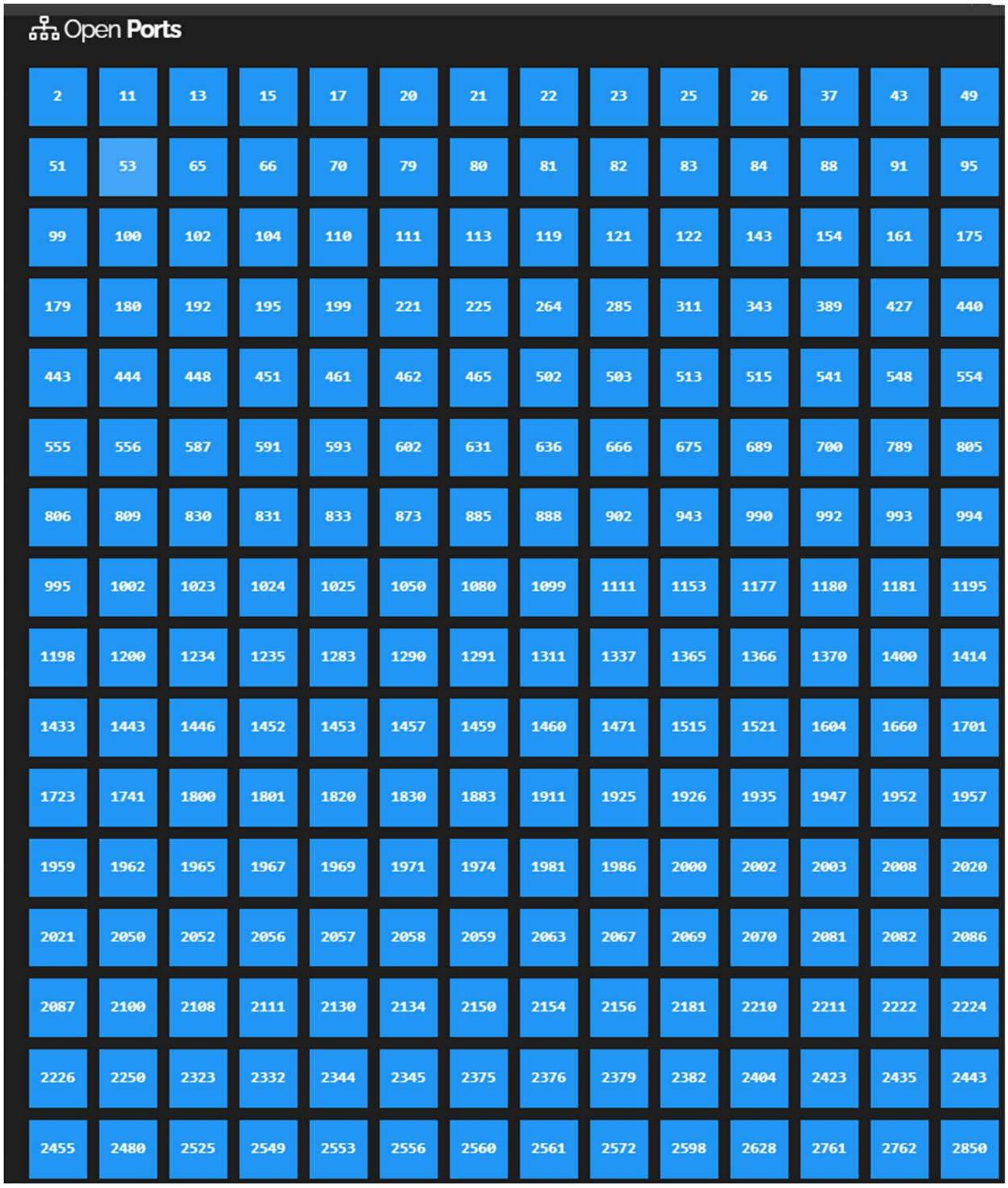


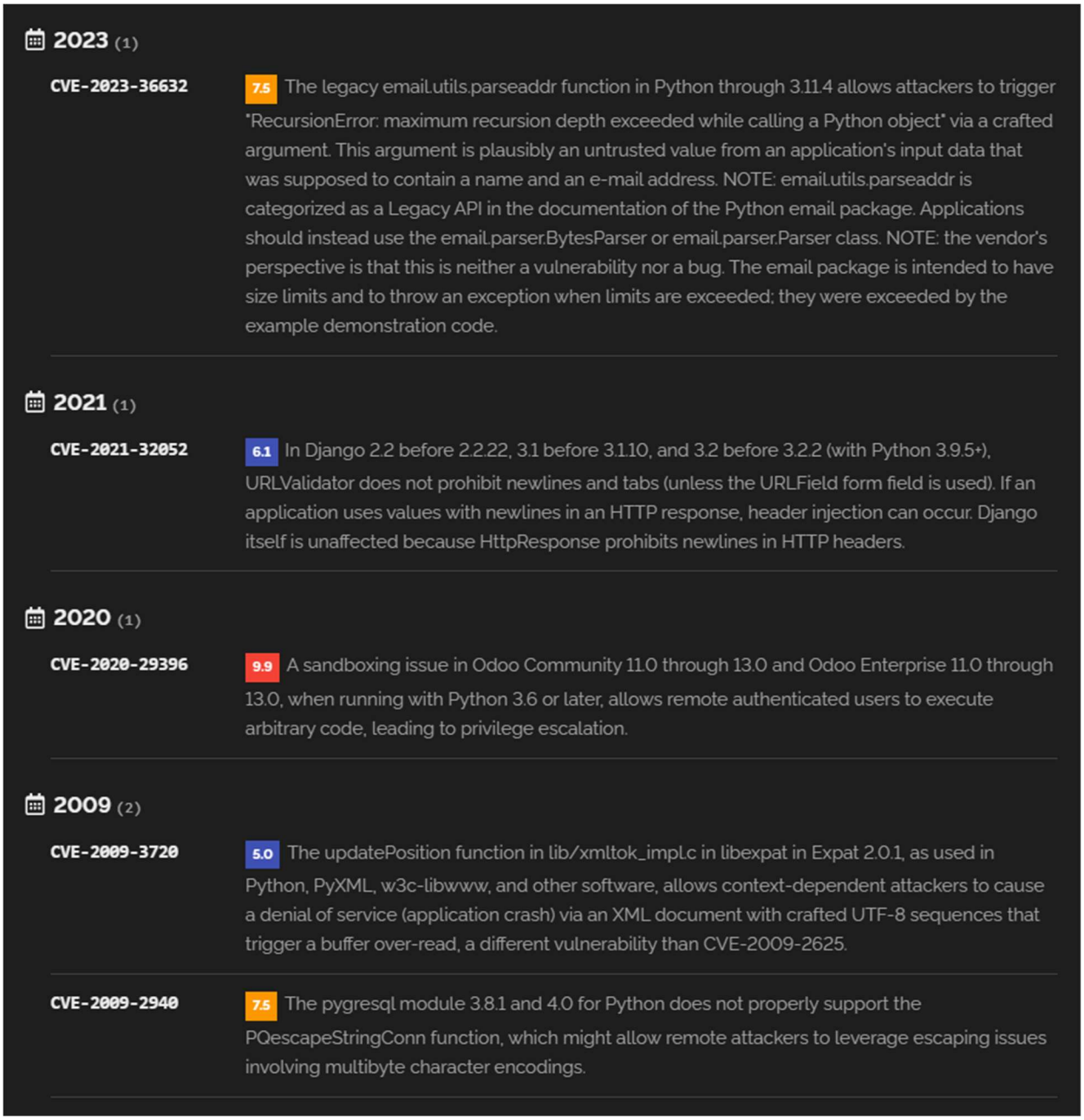
By going through Shodan, I found that the Web version of this device was build 230712. Hikvision as a company has a pdf with the related products that would be running that build in a pdf on their website. This gives a list of devices to look up vulnerabilities on. One such vulnerability is CVE-2023-48121, which is an authentication bypass vulnerability, which will allow remote attackers to get access to information by sending specific messages to the device.

Question 2: Login to Shodan again, but this time search for ***port:502***. Select a device that meets the following criteria:

1. There is at least some information in the ***device identification*** field.
2. There is at least one **CVE** listed in the ***Vulnerabilities*** section.

- **Task 1**: Capture some screenshots showing the device id, open ports, and the CVE lists. Attach the screenshots in your submission. **5 points**


Open Ports
2 11 13 15 17 20 21 22 23 25 26 37 43 49
51 53 65 66 70 79 80 81 82 83 84 88 91 95
99 100 102 104 110 111 113 119 121 122 143 154 161 175
179 180 192 195 199 221 225 264 285 311 343 389 427 440
443 444 448 451 461 462 465 502 503 513 515 541 548 554
555 556 587 591 593 602 631 636 666 675 689 700 789 805
806 809 830 831 833 873 885 888 902 943 990 992 993 994
995 1002 1023 1024 1025 1050 1080 1099 1111 1153 1177 1180 1181 1195
1198 1200 1234 1235 1283 1290 1291 1311 1337 1365 1366 1370 1400 1414
1433 1443 1446 1452 1453 1457 1459 1460 1471 1515 1521 1604 1660 1701
1723 1741 1800 1801 1820 1830 1883 1911 1925 1926 1935 1947 1952 1957
1959 1962 1965 1967 1969 1971 1974 1981 1986 2000 2002 2003 2008 2020
2021 2050 2052 2056 2057 2058 2059 2063 2067 2069 2070 2081 2082 2086
2087 2100 2108 2111 2130 2134 2150 2154 2156 2181 2210 2211 2222 2224
2226 2250 2323 2332 2344 2345 2375 2376 2379 2382 2404 2423 2435 2443
2455 2480 2525 2549 2553 2556 2560 2561 2572 2598 2628 2761 2762 2850



Task 2: Do some research about the device you chose and describe the device type and found vulnerabilities in a paragraph. Try to keep the paragraph limited into 5-10 sentences. **5 points**

Home assistant is an open source IOT home automation app. It can be used to manage and configure various devices that it is installed on, like a raspberry PI. A very severe vulnerability listed here is CVE-2020-29396. If this device's software is not up to date, this vulnerability can be exploited to remotely execute arbitrary code, leading to privilege escalation. This is bad on an IoT device because an attacker may be able to then increase their presence in your home network and compromise other devices in your network.

- **Task 3**: Select a CVE from the CVE list shown in the *Vulnerabilities* section and search for that CVE in https://cve.mitre.org/. Identify the attack/vulnerability described in the CVE.

Go to https://attack.mitre.org/matrices/enterprise/network/ and find the attack from the matrix. If the attack is not listed there, try to search in other attack matrices given in the MITRE ATT&CK website. Once you find the attack listed as a ***technique***, try to find out one relevant ***detection*** and one ***mitigation*** methods. Take screenshots showing the detection id and the mitigation id. Attach your screenshots in your submission and briefly summarize the selected detection and mitigation methods. **10 points**

This attack is perpetrated through a malicious user with an internal user account on an Odoo database crafting special code expressions (GitHub) So I chose the attack technique T1078, Valid Accounts. I chose mitigation M1018 because if you are monitoring what accounts are active and what they are doing, it will be harder for an attacker to use an account to execute malicious code. For a detection technique, I chose DS0028. By tracking who is logged on, what processes they are running, and looking for other suspicious activities, you have a better chance of knowing if malicious code is being run.

M1018	User Account Management	Regularly audit user accounts for activity and deactivate or remove any that are no longer needed.

DS0028	Logon Session	Logon Session Creation	Monitor for newly constructed logon behavior that may obtain and abuse credentials of existing accounts as a means of gaining Initial Access, Persistence, Privilege Escalation, or Defense Evasion. Correlate other security systems with login information (e.g., a user has an active login session but has not entered the building or does not have VPN access). `sourcetype="WinEventLog:Security" EventCode=4624 | stats count by _time, user, src_ip, dest_ip, LogonType| where LogonType IN ("2", "10") // Interactive or RDP logon| eval is_suspicious=if(src_ip!="expected_ip", "True", "False")| where is_suspicious="True"| table _time, user, src_ip, dest_ip, LogonType`
		Logon Session Metadata	Look for suspicious account behavior across systems that share accounts, either user, admin, or service accounts. Examples: one account logged into multiple systems simultaneously; multiple accounts logged into the same machine simultaneously; accounts logged in at odd times or outside of business hours. Activity may be from interactive login sessions or process ownership from accounts being used to execute binaries on a remote system as a particular account.