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CYBER THREAT ALLIANCE
Threat Intelligence Practitioners' Summit

Unveiling Cybersecurity Impact

The Role of Published Security Findings in Strengthening Internet Defense Strategies

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Introduction

- The importance of cybersecurity investigations
  - Where to find data
- Best practices for cybersecurity findings publishing
- How cybersecurity is shared with organizations

Goals

- Use a scientific approach when evaluating the impact of published threat reports - keep it objective
  - Data-driven insights and how they can impact evaluation
  - Assess the impact of publishing security related findings by correlation with CVEs
- Use publicly available data for threat reports
  - Collaboration and information sharing
  - Shaping defensive strategies to mitigate cyber risks
- Evaluate the impact of reported findings on the enterprise side
- Contributing to strategic defense
  - Best practices
  - How to approach

Data

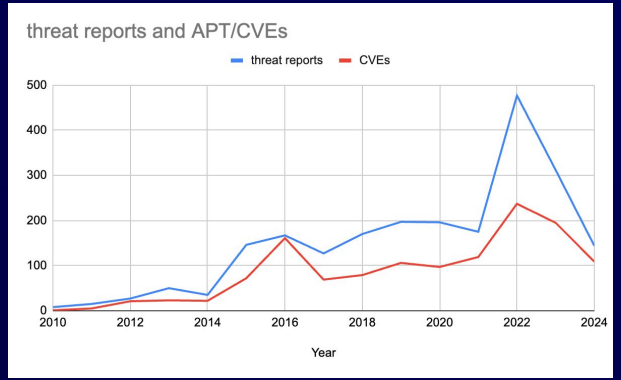
- Data in this report consists of information extracted from publicly available threat reports
  - CVE-id, report date, etc
  - Does it relate to ransomware
- Tenable focuses on threat intelligence for vulnerabilities instead of searching for threat actors
  - What and where was detected during security scans
  - Detailed information about each vulnerability

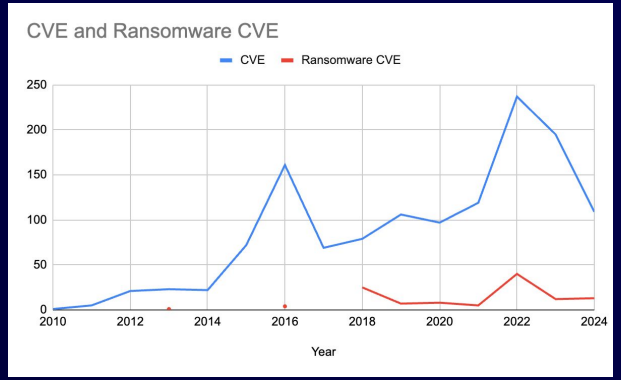
Analysed data in numbers

- 2264 threat reports published between 2010 and July 2024
- 498 of them reports mentions CVEs, some of them multiple times
- 1316 CVEs reported (449 unique)
- 256k CVEs that have been published so far

Evolution of CVEs in threat reports

		APT		Ransomware	
Year	threat reports	CVEs	Distinct CVEs	CVEs	Distinct CVEs
2010	8	1	1		
2011	15	5	5		
2012	27	21	17		
2013	50	23	9	1	1
2014	35	22	18		
2015	146	72	39		
2016	167	161	88	4	4
2017	127	69	37		
2018	170	79	43	25	10
2019	197	106	58	7	3
2020	196	97	59	8	8
2021	175	119	89	5	5
2022	477	237	106	40	29
2023	312	195	92	12	11
2024	144	109	63	13	13





Data insights

The most popular CVEs used by APT groups

- CVE-2012-0158 : 53
- **CVE-2017-11882 : 50**
- CVE-2017-0199 : 35
- CVE-2018-0802 : 24
- **CVE-2021-44228 : 21**
- **CVE-2017-5689 : 17**
- CVE-2021-26855 : 16
- CVE-2021-27065 : 15
- CVE-2022-30190 : 14
- CVE-2018-0798 : 13

The most popular CVEs used by ransomware groups

- CVE-2017-5689 : 17
- CVE-2021-44228 : 5
- CVE-2017-11882 : 4
- CVE-2021-34473 : 3
- CVE-2021-34523 : 3
- CVE-2021-31207 : 3
- CVE-2020-1472 : 2
- CVE-2019-19781 : 2
- CVE-2021-26857 : 2
- CVE-2018-8373 : 2

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How vulnerability scanning works?

- Tenable Nessus and Tenable Vulnerability Management
  - Authenticated and unauthenticated scans
  - Agent-based scans
- Vulnerability detection
  - Signature-Based Detection: Tenable uses a database of known vulnerabilities, often referred to as plugins in Nessus. Each plugin is designed to detect a specific vulnerability, misconfiguration, or compliance issue. The scanner compares the system's characteristics against these signatures to identify matches.
  - Behavioral Analysis: In addition to signature-based detection, Tenable scanning can analyze behavior patterns, such as unusual network traffic or abnormal system processes, to detect potential threats or indicators of compromise.
- Scanning
  - Scheduled
  - On demand

What affects the number of detections

- The number of detections going down
  - Patching to mitigate the threat
  - Uninstalling
- The number of detections going up
  - Adding scan profiles to look for certain vulnerabilities
  - Increasing the scan coverage
  - New plugins development

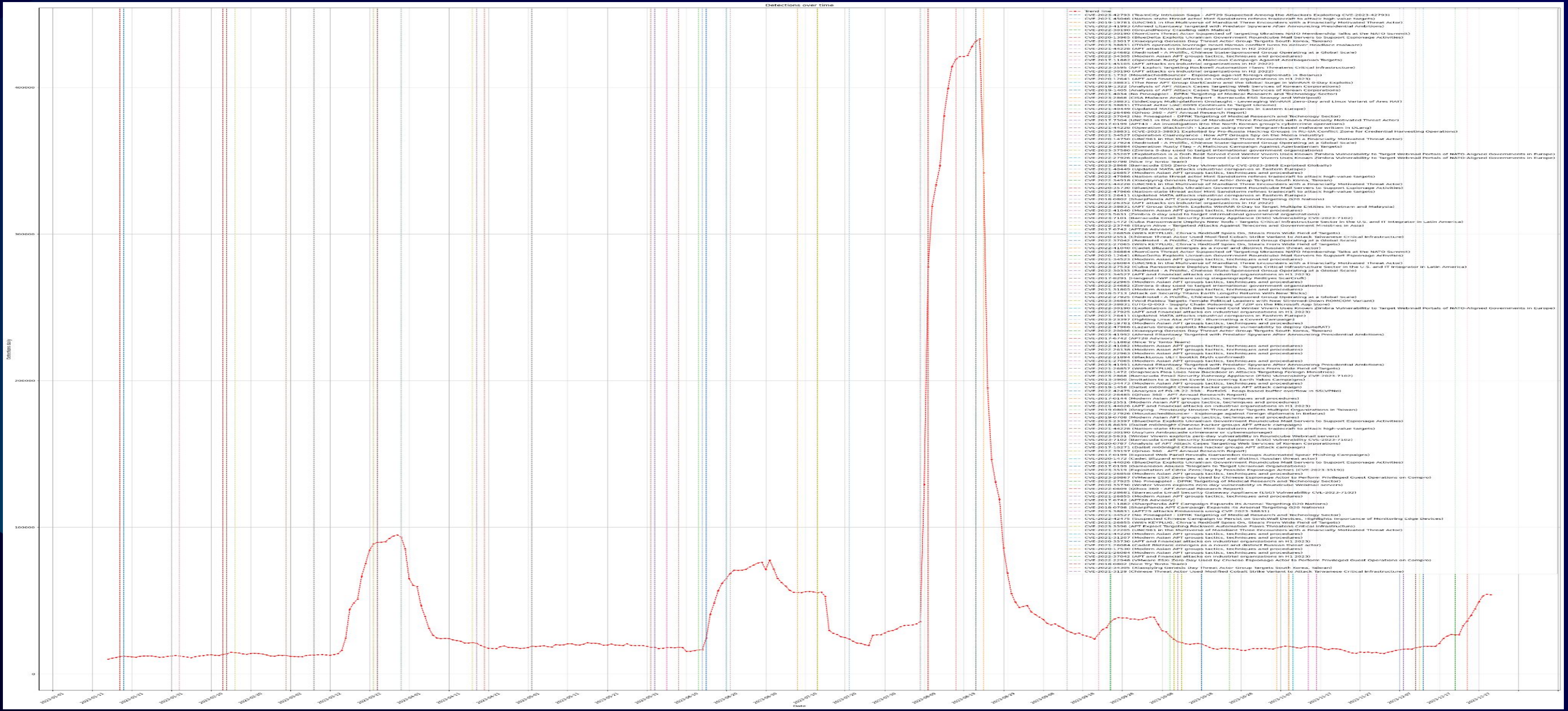
Data analysis – assumptions

- Limit threat report data to 2023 and beyond, which is the last fully completed year
- Take a representative sample of the detection data
- Assume that data from various threat reports was properly parsed and extracted
- Some Tenable plugins detect multiple similar vulnerabilities
- Try to be objective

Data analysis – plan recap

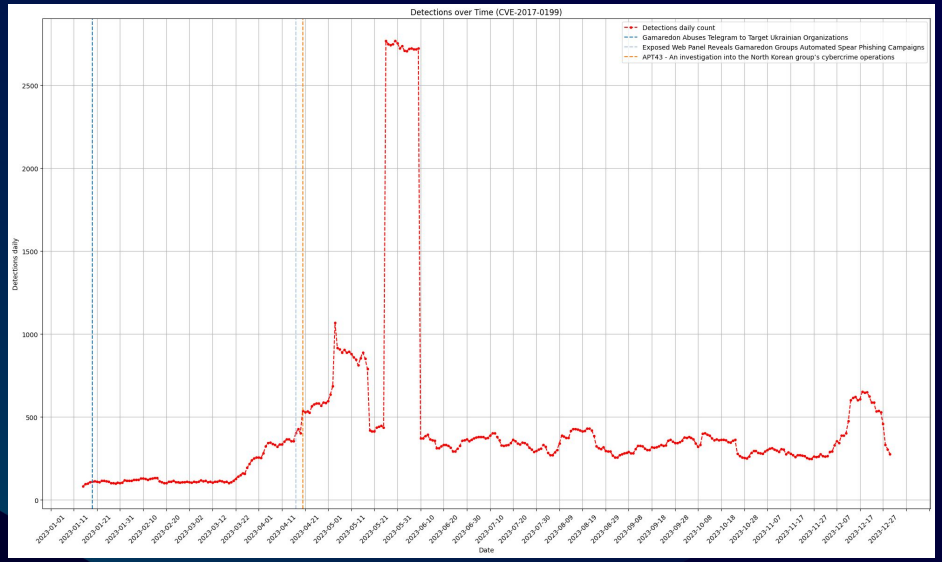
1. Take each threat report
2. Extract CVEs if any
3. Match with software
4. Obtain the trend of specific detections for a given vuln + software
5. Assess the impact or the lack of it

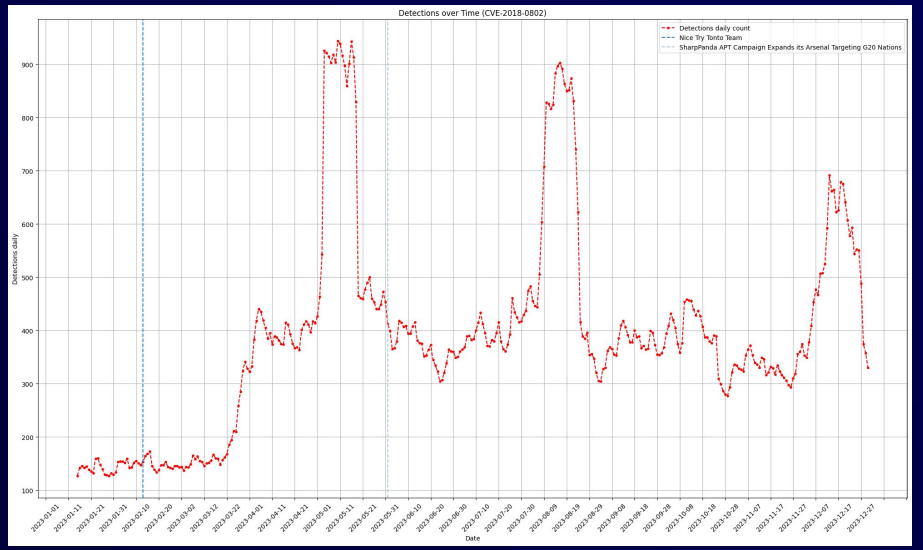
Data analysis - big picture



Data analysis

Microsoft Office: CVE-2017-0199, CVE-2018-0802





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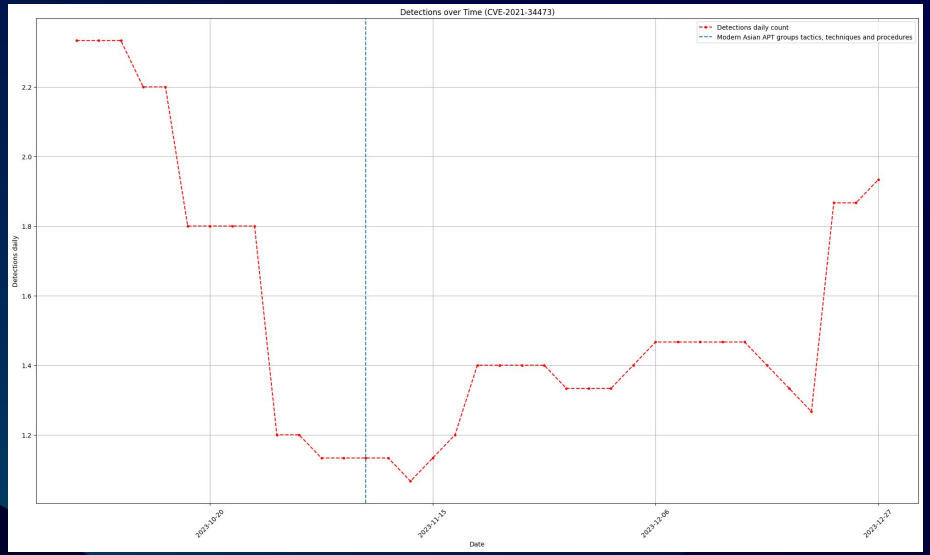
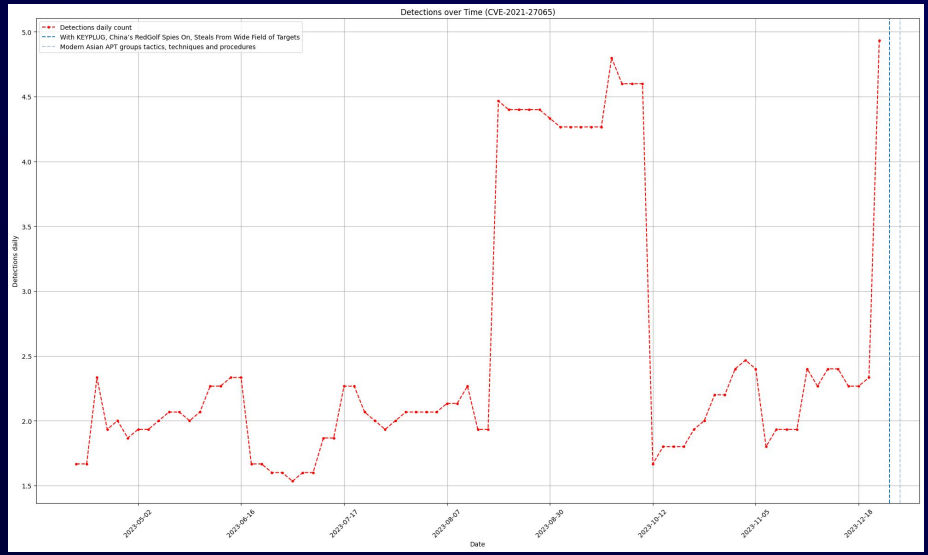
Data analysis

Microsoft Exchange: CVE-2021-34473, CVE-2021-27065





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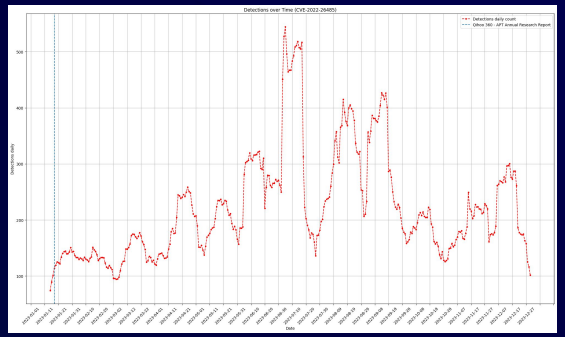
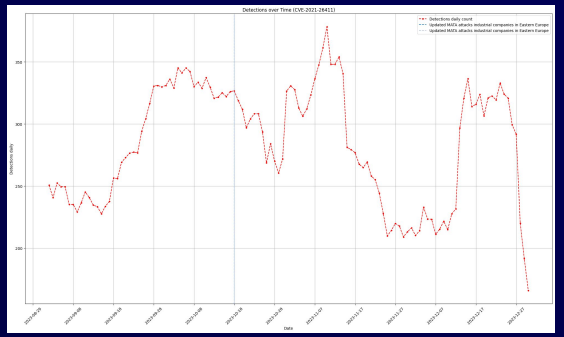
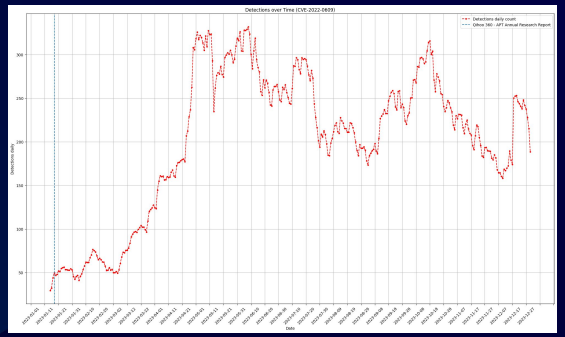
Data analysis

Browser-related exploits

- Firefox
  - CVE-2022-26485
  - CVE-2022-26486
- Internet Explorer
  - CVE-2021-26411
- Chrome
  - CVE-2022-0609







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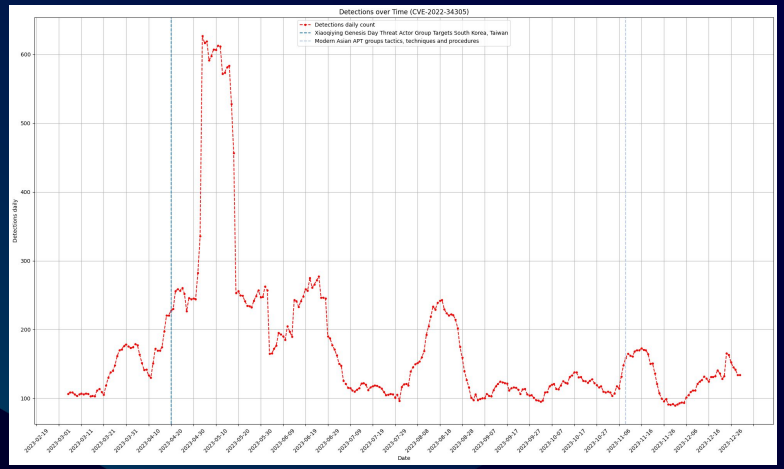
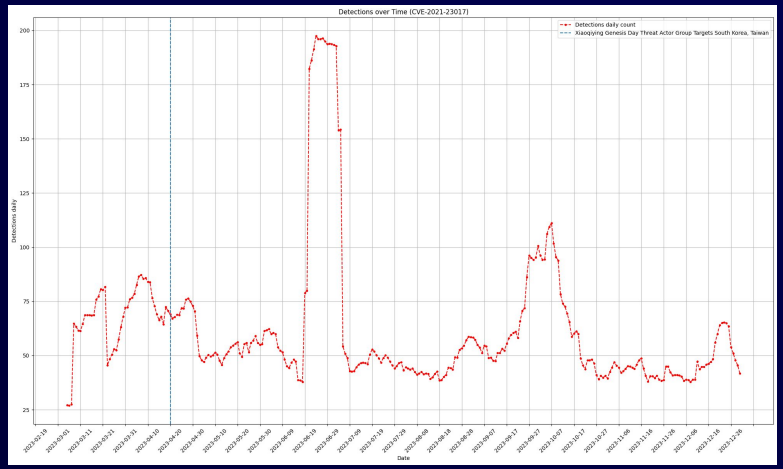
Data analysis

Web server-related vulnerabilities

- Apache tomcat
  - CVE-2022-34305
- Nginx
  - CVE-2021-23017





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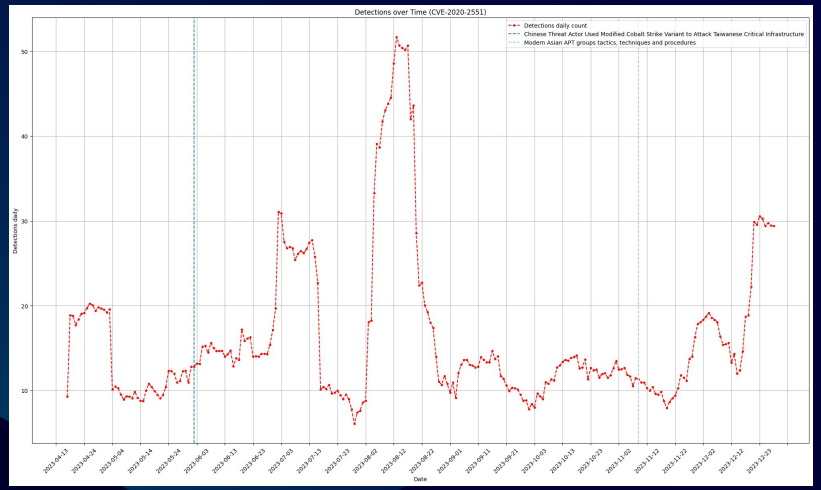
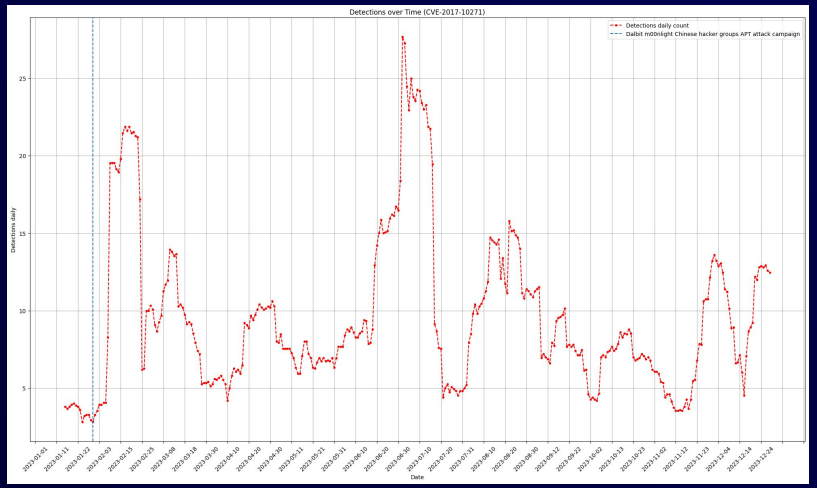
Data analysis

Web server-related vulnerabilities

- Oracle WebLogic Server
  - CVE-2017-10271
  - CVE-2020-2551





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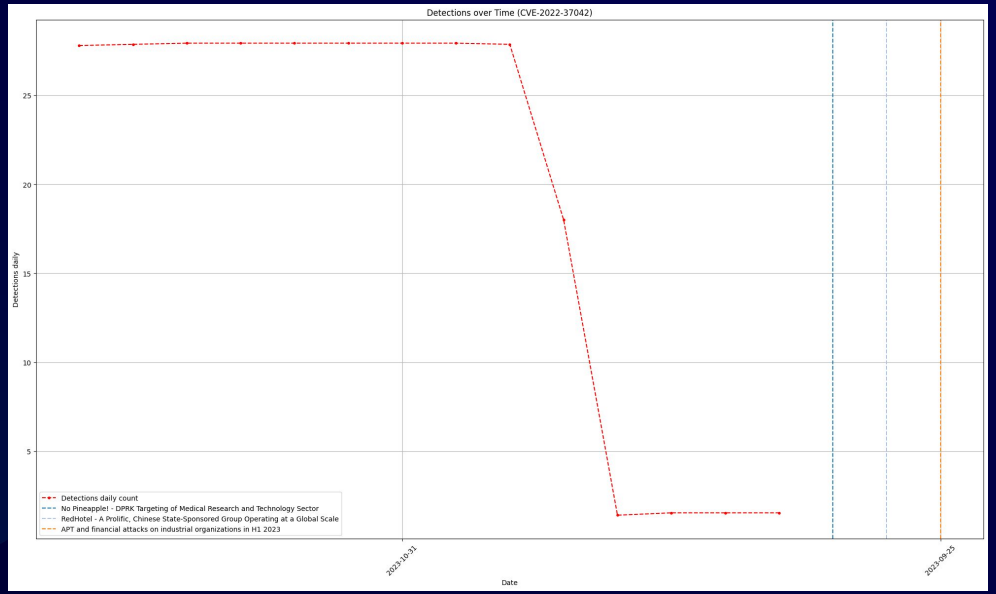
Data analysis

Zimbra Collaboration Suite (ZCS)

- CVE-2023-37580
- CVE-2022-27925
- CVE-2022-24682
- CVE-2022-27926
- CVE-2022-37042
- CVE-2022-27924
- CVE-2021-35207



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Impact by affected software

	CVE impact type			
	name	no impact	impact	no data
Windows	Windows		2	2
	Other windows	2	2	
	Win32k	1	3	
	Windows Search	1		
Enterprise	Exchange	1	5	3
	MS Office		4	
	MS Outlook		1	
	SMBv1 server		1	
	BITS		1	
	Remote Desktop	1		
	Windows Print Spooler		1	
	msdn		1	
Browsers	Internet Explorer		1	
	Firefox		2	
	Google Chrome		1	

	CVE impact type			
	name	no impact	impact	no data
OS	macOS Sonoma		1	
	macOS Ventura		1	
	macOS Monterey		1	
	Linux kernel		1	
Servers	Apache Tomcat		1	
	WebLogic Server		3	
	Nginx		1	
Developm	Apache Log4j		2	
	Spring MVC		1	1
	Apache Struts		2	
Other	Winrar / Unrar	2		
	VMware / vCent	1	1	
	Roundcube Web			4
	ZCS Zirnbra	7		

Impact by affected software

- Summary includes only those vulns of reported usage in 2023

Category	Impact Chance
Windows	53.85%
Enterprise	73.68%
Browsers	100.00%
OS	100.00%
Servers	100.00%
Development	83.33%
Other	6.67%

Data analysis – impact

	date	title	impactful	other	total
1	2023-11-09	Modern Asian APT groups tactics, techniques and procedures	7	14	21
2	2023-01-18	Qihoo 360 - APT Annual Research Report	3	1	4
3	2023-03-24	(ransomware) APT attacks on industrial organizations in H2 2022	3	1	4
4	2023-01-31	Dalbit m00nlight Chinese hacker groups APT attack campaign	3	0	3
5	2023-02-13	Nice Try Tonto Team	3	0	3
6	2023-09-22	Ahmed Eltantawy Targeted with Predator Spyware After Announcing Presidential Ambiti	3	0	3
7	2023-06-01	SharpPanda APT Campaign Expands its Arsenal Targeting G20 Nations	3	0	3
8	2023-04-20	Xiaoqiying Genesis Day Threat Actor Group Targets South Korea, Taiwan	3	1	4
9	2023-10-18	Updated MATA attacks industrial companies in Eastern Europe	2	0	2
10	2023-07-13	APT Exploit Targeting Rockwell Automation Flaws Threatens Critical Infrastructure	2	0	2
11	2023-04-18	Nation-state threat actor Mint Sandstorm refines tradecraft to attack high-value targets	2	2	4
12	2023-08-22	Analysis of APT Attack Cases Targeting Web Services of Korean Corporations	2	1	3
13	2023-03-23	(ransomware) UNC961 in the Multiverse of Mandiant Three Encounters with a Financial	2	4	6
14	2023-02-02	No Pineapple! - DPRK Targeting of Medical Research and Technology Sector	2	2	4

Data analysis – impactful threat reports

- Out of 60 reports that mentioned CVEs, 38 had corresponding data showing some impact.
- Bigger impact is proportional to the amount of included vulnerabilities
  - So annual reports or an aggregation of cases will be more impactful
- If ransomware is involved, higher impact
- Impactful reports can come from any region
- Many of them are from smaller but specialized organizations
- Impact is observed rather quickly
  - E.g., A report published in November is still impactful in the same year

Data analysis – impactful threat reports

- Why do certain reports despite having great findings don't get attention in the security community?
  - The vulnerability was already well-known and patched by users
  - Visibility of some specific software in telemetry could be poor, e.g., certain regions
  - No detection plugin was developed during the described event

Information sharing - how to improve

- The impact of the publishing source
  - Does it depend on the publisher?
  - Nation-state, zero-day, targets, ransomware
- Unify threat reports publications
  - Currently researchers have to track multiple sources so new sources can be overlooked
  - Include the threat report source type (ransomware, APT) and publisher

Questions?

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Thank you!

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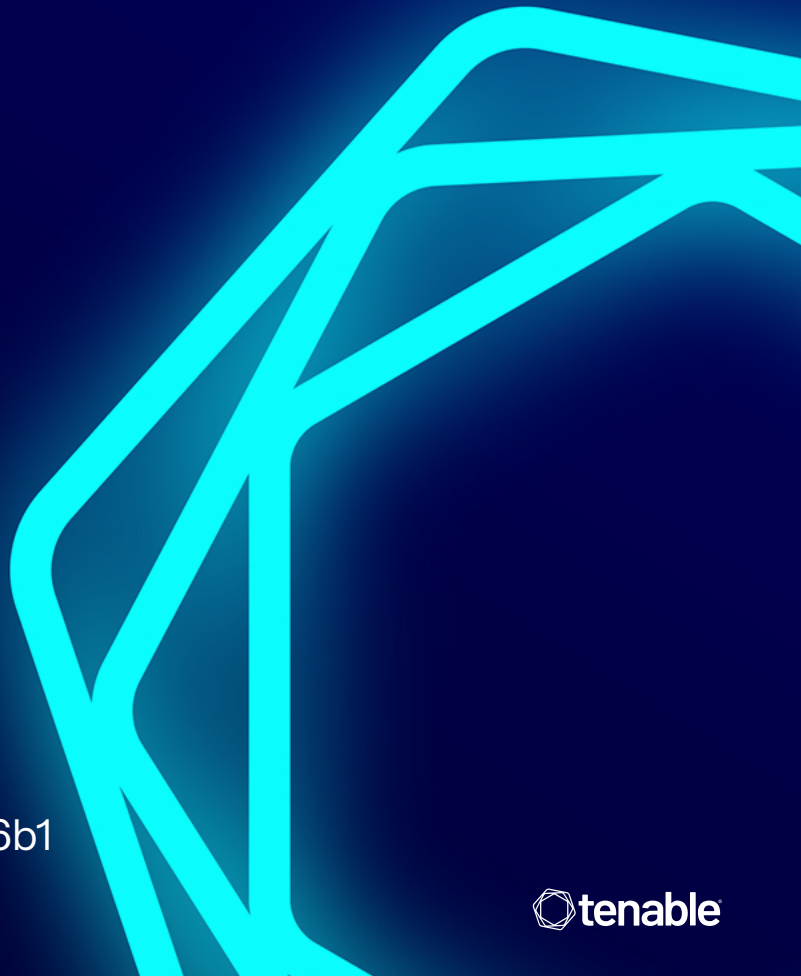

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