HC3: Analyst Note
February 7, 2024 TLP:CLEAR Report: 202402071200

Akira Ransomware

Executive Summary
Akira ransomware is a relatively new ransomware gang that has demonstrated aggressive and capable targeting of the U.S. health sector in its short lifespan. U.S. healthcare organizations are advised to follow the steps in this alert to minimize their risk of attack.

Overview
Akira ransomware was first identified in May of 2023, and in less than a year, it has claimed at least 81 victims. It should not be confused with another ransomware variant known as Akira, which was briefly observed in 2017 but is believed to be unrelated to the most recent and active variant, which is the subject of this paper. There is research suggesting that Akira has connections to the now-defunct Conti ransomware gang. The technical details of this include similarities in their exploitation approach, the selection of certain types of files and directories for targeting, their choice of application for encryption algorithms, their use of ransom payment addresses, and the incorporation of comparable functions. While any formal relationship or connection between the two groups has not been confirmed, such a connection could indicate a degree of sophistication to Akira's operations, and reinforce the idea that they are highly capable and should be considered a serious threat.

Akira leverages many common features for their targeting and operations. They operate as ransomware-as-a-service (RaaS), which is to say they focus on the ransomware operations, but partner with other cybercriminals for individual attacks and share the extorted fees. They also conduct double extortion; they steal sensitive data, deploy their ransomware, and then charge two fees. The first fee restores the encrypted systems, and the second fee ensures no leaks of stolen data. They are highly reliant on credential compromise as an infection vector, which provides them initial access into their target networks. Akira also operates a leak site where they publicly post information on their victims. Their targeting includes both Windows and Linux infrastructure, and while organizations in the United States are their focus, their targeting is global. They are also known to target the United Kingdom, Canada, Australia, New Zealand and other countries.

Targeting and Scope of Attacks
Research indicates that geographically, while Akira is global in their targeting, their focus continues to be on the United States. Their targeting within the United States has been focused on organizations in California, Texas, Illinois, and the East Coast, especially the Northeast. This appears to be due to the geographic locations of specific targets, rather than deliberately targeting these states. Akira's most-targeted industries include materials, manufacturing, goods and services, construction, education, finance, legal, and healthcare. Open source reporting

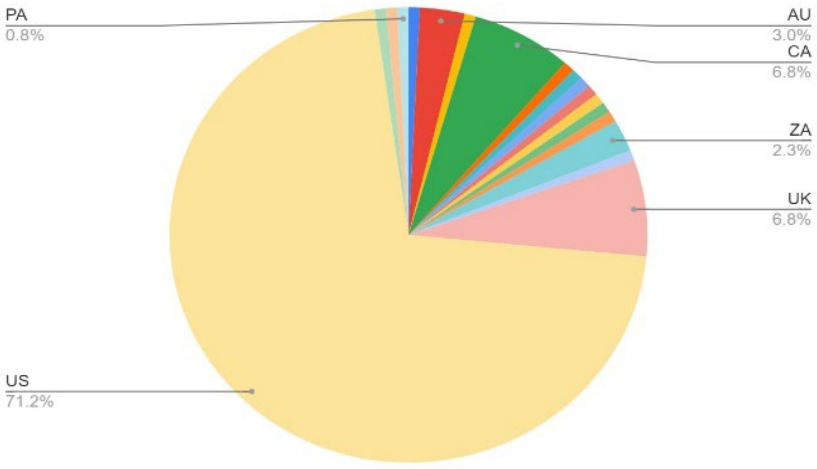

Figure 1: Akira victim distribution by country. *(Source: Trellix)*

and analysis consistently shows the health sector being one of the top industries targeted by Akira.

Tactics, Techniques, and Procedures (TTPs)

The following is a list of known tactics and techniques commonly used by the Akira ransomware gang, mapped against the MITRE ATT&CK framework. This list represents a significant collection of the most frequent activities by Akira, however it is not a comprehensive list. The references secton of this report contains resources where additional details on Akira attacks, including other tactics and techniques, can be found.

Initial Access

T1566.001 - Spearphishing Attachment
T1566.002 - Spearphishing Link
T1078 - Valid Accounts
T1190 - Exploit Public-Facing Application
T1195 - Supply Chain Compromise

Privilege Escalation

T1078 - Valid Accounts
T1136.002 – Create Account: Domain Account
T1547.009 - Shortcut Modification
T1547.001 - Registry Run Keys / Startup Folder

Persistence

T1078 - Valid Accounts
T1547.009 - Shortcut Modification
T1547.001 - Registry Run Keys / Startup Folder

Lateral Movement

T1570 – Lateral Tool Transfer

Data Collection

T1114.001 - Local Email Collection

Data Exfiltration

T1567 - Exfiltration Over Web Service
T1041 - Exfiltration Over C2 Channel
T1537 - Transfer Data to Cloud Account
T1029 - Scheduled Transfer
T1020 - Automated Exfiltration

Execution

T1059.001 - PowerShell
T1569.002 - Service Execution
T1059.003 - Windows Command Shell

Impact

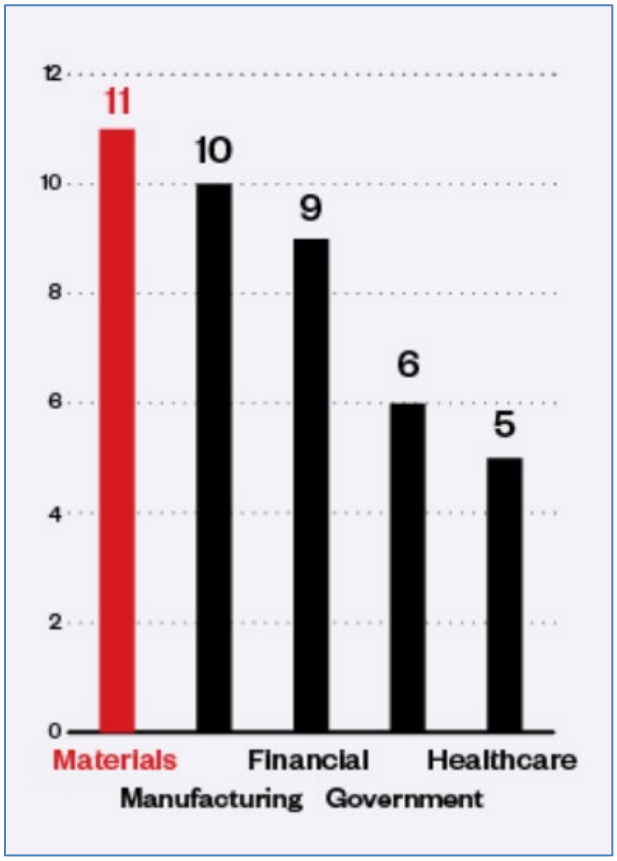

Figure 2: A sample of Akira's targeting by industry.
(Source: Trend Micro, leveraging data collected from May to August 2023)

T1486 - Data Encrypted for Impact

Defensive Evasion
T1078 - Valid Accounts
T1027.001 - Binary Padding
T1036.005 - Match Legitimate Name or Location
T1562.001 – Impari Defenses: Disable or Modify Tools

The below diagram is a step-by-step illustration of an Akira attack, leveraging several of the tactics and techniques described immediately above. In the below example, the Akira gang exploits a vulnerability in virtual private network software to gain initial access to their target. They then create an account (ostensibly via the VPN application) in order to establish persistent access to the network. After using appropriate tools to attempt to obscure their activities from detection, they immediately begin conducting network reconaissance (discovery) to understand their operational environment. They leverage tools to acquire existing credentials, move around the infrastructure and establish communications (command and control) back to their infrastructure. They finally steal data and deploy ransomware.

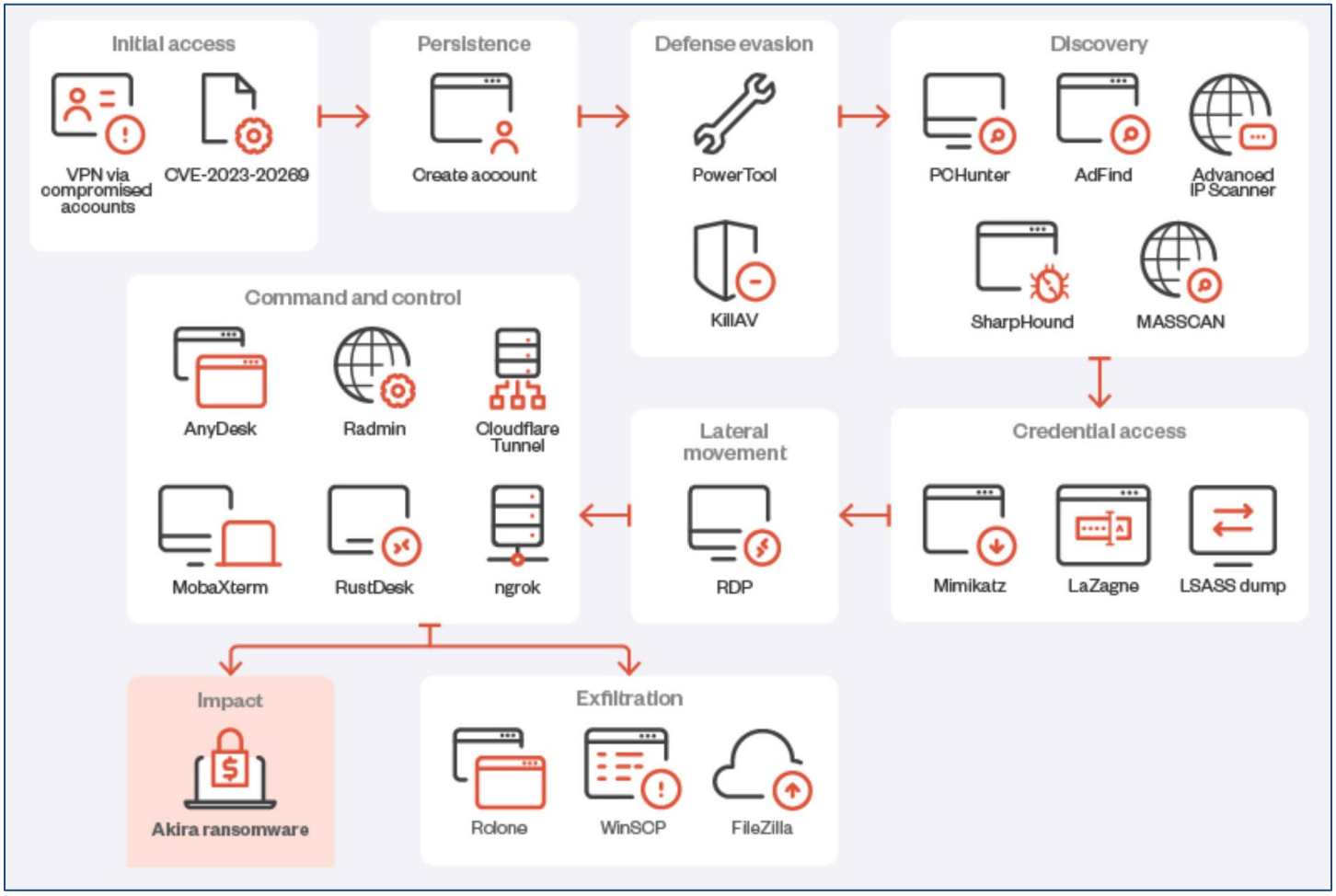

Figure 3: Akira attack diagram with typical MITRE-mapped tactics and techniques. *(Source: Trend Micro)*

Due to the nature of their operations, ransomware operators are enticed by data storage – both in-house and outsourced – and this can be seen in some of the more recent targeting by Akira. For example, in Jaunary of 2024, Akira successfully targeted the Finnish IT software and service company, Tietoevry, and


```
{"timestamp":"2023-01-03T11:38:35.000Z","user":"unknown","account":"*****","result":"FAILED_BAD_LOGIN",
"source_ip":"62.204.41.146","service":"vpn","geoip_country_code":"RU","geoip_country_name":"Russia",
"geoip_organization":"Horizon LLC","source_data":"<166>Jan 03 2023 05:38:35 FW : %ASA-6-:
Group  User <*****> IP <62.204.41.146> Authentication: rejected, Session Type: WebVPN. "}

{"timestamp":"2023-01-06T11:03:59.000Z","user":"TestUser","account":"test","result":"FAILED_BAD_LOGIN",
"source_ip":"179.60.147.152","service":"vpn","geoip_city":"Moscow","geoip_country_code":"RU",
"geoip_country_name":"Russia","geoip_organization":"Flyservers S.A.","geoip_region":"MOW","source_data":
"<166>Jan 06 2023 05:03:59 FW-%ASA-6-: "}
```


Figure 4: An example of anonymized log entry where the attacker attempts and fails to login to a CISCO ASA SSL VPN. *(Source: Rapid7)*

more specifically, their cloud hosting infrastructure. Furthermore, the Finnish National Cybersecurity Center reported on a campaign in December of 2023, where Akira was targeting network-attached storage devices in order to completely wipe them of data, allowing them to potentially ramp up extortion pressure even further. In the latter case, Akira exploited an unauthorized access vulnerability in the VPN feature in Cisco's Adaptive Security Appliance and Firepower Threat Defense platforms, tracked as CVE-2023-20269. This allows unauthorized attackers – in this case, Akira – to carry out brute force attacks (see Figure 4 as an example of an attempt to compromise a Cisco VPNs) and locate existing user credentials. Following initial access, observed activity in this campaign included network reconaissance and mapping, compromising credentials, and data encryption. Some of the usernames utilized for device compromise in this campaign included: admin, adminadmin, backupadmin, kali, cisco, guest, accounting, developer, ftp user, training, test, printer, echo, security, inspector, test test, and snmp. Upon successful authentication, set.bat was sometimes deployed, which installed and executed the remote desktop tool AnyDesk, with a configured password "greenday#@!". In some instances, nd.exe was executed on systems to dump NTDS.DIT, and the SAM and SYSTEM hives. As noted in this campaign, this may have given the adversary access to additional domain credentials. This was followed by lateral movement and binary executions on other systems to increase the scope of compromise. In several cases, the final result of the attack was the deployment of Akira ransomware.

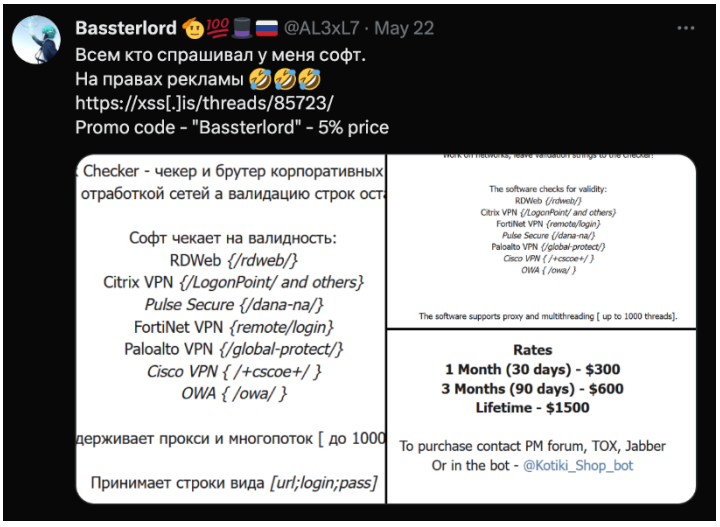

Figure 5: A screenshot of a dark web offering for a guide to compromising corporate networks, including via Cisco VPNs. *(Source: Rapid7)*

Financials

As previously mentioned, there are technical indicators tha the Akira ransomware gang might have some connection to the Conti ransomware gang. Conti discontinued operations shortly after the Russian incursion into Ukraine in February of 2022, and the subsequent leaking of the Conti code, which was ostensibly prompted by infighting within the group caused by divided alliances related to the Russia-Ukraine war. In addition to similarities between operational procedures and technical aspects of the ransomware code, an additional connection exists: financial infrastructure. Cryptocurrency transactions are not completely anonymous. This is due to the fact that all of them - Bitcoin and the altcoins - all operate on a blockchain, which is a distributed, public digital ledger. The public nature of blockchain

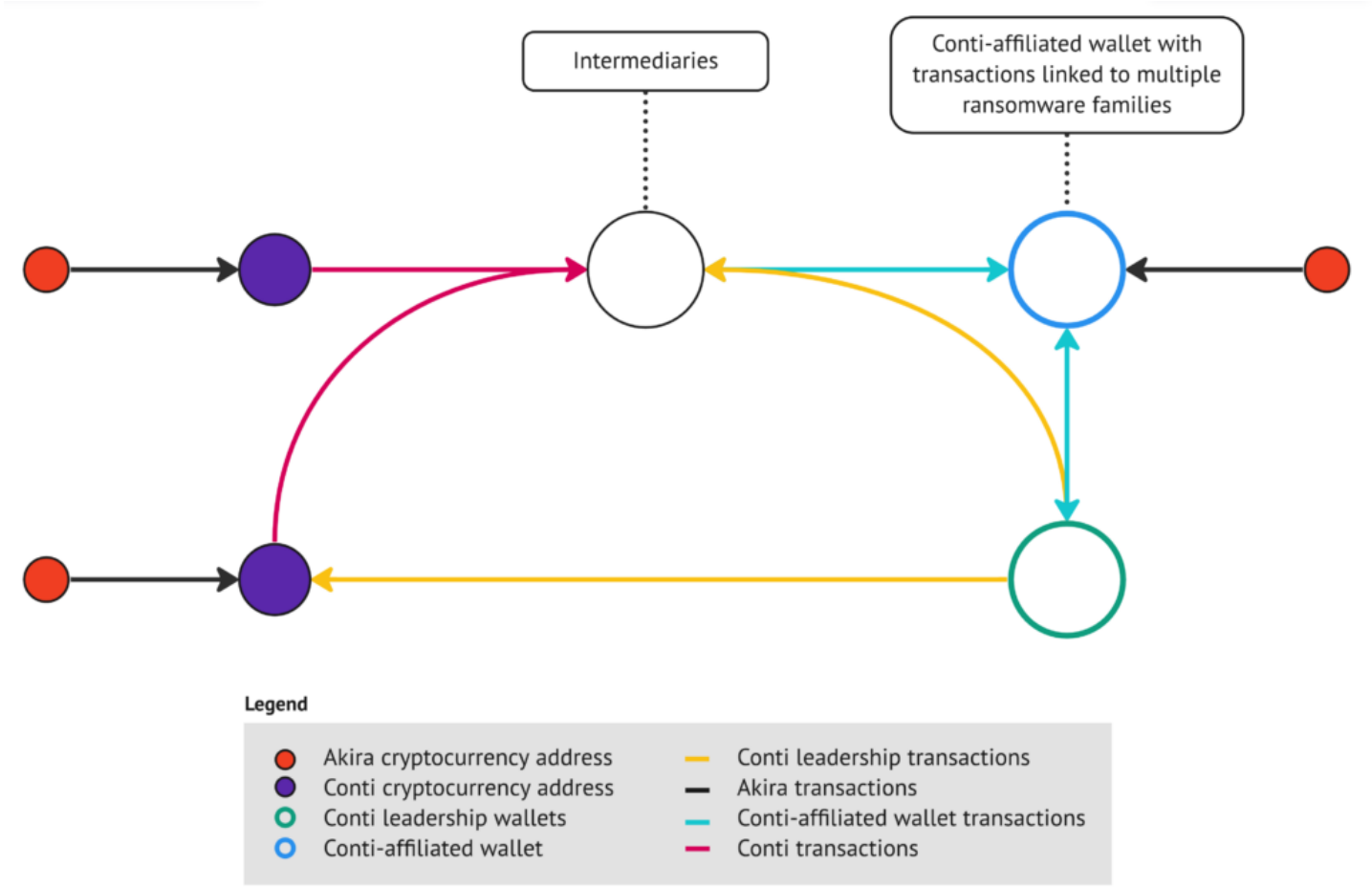

Figure 6: Overlapping financial infrastructure between Akira and Conti. *(Source: Arctic Wolf)*

makes transactions open to examination by the public. While certain technologies can make this more complicated, such as the use of privacy coins, mixers or privacy wallets, a cryptocurrency transaction could not be conducted with 100% certainty of privacy. To some extent, attribution is almost always possible, even if exceptionally challenging in some cases. According to analysis of the transaction details between Akira victims and the Akira group itself, there is shared infrastructure between Akira and Conti, bolstering the case that there is an overlap of talent between the two groups. In an examination of Akira's known cryptocurrency wallet addresses, pattern analysis of the transactions allows for the discovery of additional

wallet addresses, and in some cases, this effort has uncovered instances of certain wallets being reused between both Akira and Conti. This potentially indicates that one or more individuals who were active members of Conti subsequently joined Akira after the dissolution of Conti. This determination cannot be made definitively, but when considered along with previous technical overlaps between the two groups, the possibility of talent utilized acorss both groups becomes increasingly likely. This assessment is important in understanding the level of sophistication within the Akira group. Conti was an established and highly-capable ransomware gang, believed to be the predecessor to or overlapping with a previous ransomware gang named Ryuk. This indicates that Akira includes members who have a long and successful history of operating ransomware, making the group a significant threat to potential victims.

Defense and Mitigations

The following resources and guidance are provided by various elements of the federal government to assist the health sector in defending against, mitigating the effects of, and reporting ransomware attacks:

- DHS/CISA Stop Ransomware: https://www.cisa.gov/stopransomware
- FBI Cybercrime: https://www.fbi.gov/investigate/cyber
- FBI Internet Crime Complaint Center (IC3): https://www.ic3.gov/Home/ComplaintChoice/default.aspx/
- FDA - Medical Device Security Information: https://www.fda.gov/medical-devices/digital-health-center-excellence/cybersecurity
- H-ISAC White Papers: https://h-isac.org/category/h-isac-blog/white-papers/
- 405(d) Resource Library: https://405d.hhs.gov/resources
- HC3 Products: https://www.hhs.gov/about/agencies/asa/ocio/hc3/index.html

Furthermore, the FBI recommends the following steps:

- Review domain controllers, servers, workstations, and active directories for new or unrecognized user accounts.
- Regularly back up data, air gap, and password-protect backup copies offline. Ensure copies of critical data are not accessible for modification or deletion from the system where the data resides.
- Review Task Scheduler for unrecognized scheduled tasks. Additionally, manually review operating system-defined or system-recognized scheduled tasks for unrecognized “actions.” (For example, review the steps each scheduled task is expected to perform.)
- Review anti-virus logs for indications that they were unexpectedly turned off.
- Implement network segmentation.
- Require administrator credentials to install software.
- Implement a recovery plan to maintain and retain multiple copies of sensitive or proprietary data and servers in a physically separate, segmented, secure location (e.g., hard drive, storage device, the cloud).
- Install updates/patch operating systems, software, and firmware as soon as updates/patches are released.
- Use multi-factor authentication where possible.
- Regularly change the passwords to network systems and accounts and avoid re-using passwords for different accounts.
- Implement the shortest acceptable timeframe for password changes.

- Disable unused remote access/Remote Desktop Protocol (RDP) ports and monitor remote access/RDP logs.
- Audit user accounts with administrative privileges and configure access controls with least privilege in mind.
- Install and regularly update anti-virus and anti-malware software on all hosts.
- Only use secure networks and avoid using public Wi-Fi networks. Consider installing and using a virtual private network (VPN).
- Consider adding an email banner to emails received from outside your organization.
- Disable hyperlinks in received emails.

Also, the 3-2-1 rule is important to implement across the enterprise. This means:

- Maintain at least three copies of all important files.
- Store these files on two different media types.
- Ensure one copy is offsite and preferably offline.

In addition to the above generic ransomware guidance, the following resources will assist the health sector in defending against and mitigating the effects of Akira ransomware attacks:

Indicators of compromise:

- Kaspersky: 0885b3153e61caa56117770247be0444
- Kaspersky: 02cda932f5a9dafb0a328d0f9788bd89c
- Kaspersky: 00141f86063092192baf046fd998a2d1
- Rapid7 IP addresses can be found here.
- Avast hashes listed below can be found here.
- Sophos has developed a Yara rule which can be found here.
- Trend Micro hashes can be found here:

Health sector organizations would be well-advised to take the following steps to defend against Akira attacks:

- Ensure identity and access management capabilities are in place, robust, and properly configured.
  - This is especially applicable to multi-factor authentication (MFA) for VPNs. Akira has a history of compromising VPNs that are not protected with MFA.
- Akira is heavily focused on exploiting legitimate remote access tools in addition to previously-mentioned VPNs, which include AnyDesk and tools that leverage the Remote Desktop Protocol.
  - Patch management for these tools (as well as other applications, especially those that are Internet-facing) is critical.
- Ensure credentials are properly protected and appropriate password maintenance/update policies are in place and enforced. Akira has a history of compromising credentials stored in Active Directory and dumping LSASS process memory.
  - Adding user accounts to security-enabled local groups will help prevent against Akira's compromise of accounts to establish persistent access.
  - Monitoring for account compromise and unusual activity, and ensuring old, unused accounts are automatically deleted after a period of time can help reduce the attack surface.

Avast released a decryptor for Akira which can be found here.

Conclusions

The Akira ransomware gang, despite having only operated for a short period of time, has proved to be a significant threat to the U.S. public and private health sectors. While many of the recommend defense and mitigation actions apply universally to most ransomware gangs, there are Akira-specific details in this alert which should also be implemented. Finally, while the technical details and actions contained in this alert are up-to-date, it is also worth noting that cybercriminals, especially major ransomware operators such as Akira, evolve over time. It will be important for any healthcare organization that wishes to stay secure in cyberspace to keep up with Akira's latest tactics, techniques and procedures (TTPs). HC3 will continue to release products as appropriate on a number of cybercriminal threats, including Akira, but it is critical for healthcare organizations to continuously monitor open-source reporting on Akira and consider any commercial threat intelligence support to augment public information as appropriate.

References

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Akira ransomware targets Cisco VPNs to breach organizations
https://www.bleepingcomputer.com/news/security/akira-ransomware-targets-cisco-vpns-to-breach-organizations/

Conti and Akira: Chained Together
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Blockchain data shows Conti gang tied to Akira and spate of ransomware attacks
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https://www.bleepingcomputer.com/news/security/finland-warns-of-akira-ransomware-wiping-nas-and-tape-backup-devices/

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https://www.rapid7.com/blog/post/2023/08/29/under-siege-rapid7-observed-exploitation-of-cisco-asa-ssl-vpns/

Appendix A: Additional Supporting Data Points

The following information is intended to augment/reinforce the main content of this alert.

According to research from Trend Micro and Avast, Akira does not encrypt the following file types:

.exe	.dll	lnk	.sys
msi	PLAY	akira_readme.txt	(the ransom note)

Akira also avoids encrypting the following directories:

winnt	tmp	temp	thumb	$Recycle.Bin	$RECYCLE.BIN
System Volume Information		Boot	Windows	Trend Micro	ProgramData

Akira is known to encrypt the following file types:

.4dd	.cpd	.dsk	.gdb	.mav	.owc	.spq	.xld
.4dl	.dacpac	.dsn	.grdb	.mdb	.p96	.sql	.xmlff
.accdb	.dad	.dtsx	.gwi	.mdf	.p97	.sqlite	.abcddb
.accdc	.dadiagrams	.dxl	.hdb	.mpd	.pan	.sqlite3	.abs
.accde	.daschema	.eco	.his	.mrg	.pdb	.sqlitedb	.abx
.accdr	.db	.ecx	.ib	.mud	.pdm	.te	.accdw
.accdt	.db-shm	.edb	.idb	.mwb	.pnz	.temx	.adn
.accft	.db-wal	.epim	.ihx	.myd	.qry	.tmd	.db2
.adb	.db3	.exb	.itdb	.ndf	.qvd	.tps	.fm5
.ade	.dbc	.fcd	.itw	.nnt	.rbf	.trc	.hjt
.adf	.dbf	.fdb	.jet	.nrmlib	.rctd	.trm	.icg
.adp	.dbs	.fic	.jtx	.ns2	.rod	.udb	.icr
.arc	.dbt	.fmp	.kdb	.ns3	.rodx	.udl	kdb
.ora	.dbv	.fmp12	.kexi	.ns4	.rpd	.usr	.lut
.alf	.dbx	.fmpsl	.kexic	.nsf	.rsd	.v12	.maw
.ask	.dcb	.fol	.kexis	.nv	.sas7bdat	.vis	.mdn
.btr	.dct	.fol	.lgc	.nv2	.sbf	.vpd	.mdt
.bdf	.dcx	.fp4	.lwx	.nwdb	.scx	.vvv	
.cat	ddl	.fp5	.maf	.nyf	.sdb	.wdb	
.cdb	.dlis	.fp7	.maq	.odb	.sdc	.wmdb	
.ckp	.dp1	.fpt	.mar	.oqy	.sdf	.wrk	
.cma	.dqy	.frm	.mas	.orx	.sis	.xdb	

The following graphic by Trellix shows the how commands and arguments are processed:

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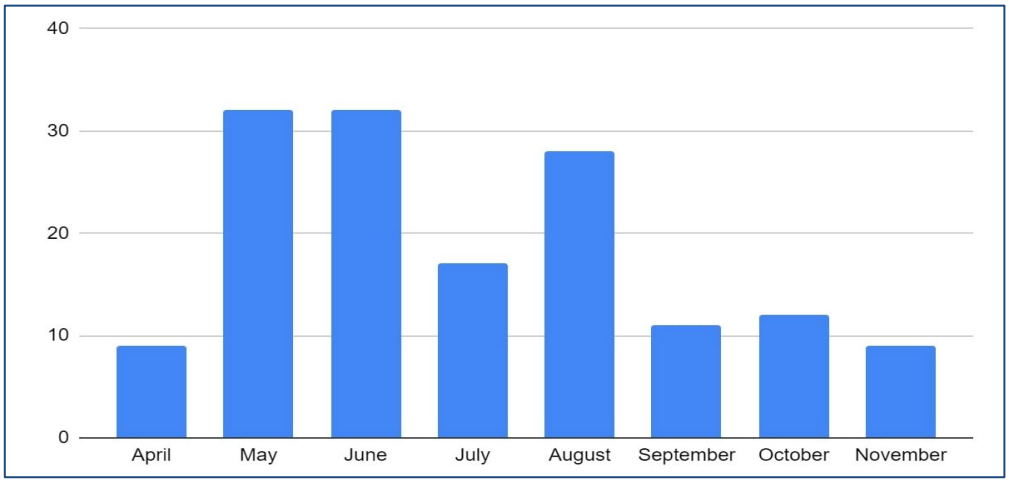
```
v166[0] = "-s";
v166[1] = "--share_file";
*&v117 = v166;
*(&v117 + 1) = &v167;
v199 = v117;
v11 = sub_14001F9D0(&v144, v216, &v199);
sub_140021AA0(v11, lpMultiByteStr);
*(v216 + *(v216[0] + 4)) = &std::istringstream::`vftable';
*(&v215[11] + *(v216[0] + 4) + 4) = *(v216[0] + 4) - 144;
std::stringbuf::~stringbuf(v217);
*(v216 + *(v216[0] + 4)) = &std::istream::`vftable';
*(&v215[11] + *(v216[0] + 4) + 4) = *(v216[0] + 4) - 24;
v218[0] = &std::ios_base::`vftable';
std::ios_base::_Ios_base_dtor(v218);
*&v117 = "-n";
*(&v117 + 1) = "--encryption_percent";
*&v121 = &v117;
*(&v121 + 1) = &pcbStructInfo;
v198 = v121;
v12 = sub_14001F9D0(&v144, v219, &v198);
sub_140021AA0(v12, String);
*(v219 + *(v219[0] + 4)) = &std::istringstream::`vftable';
*(&v218[11] + *(v219[0] + 4) + 4) = *(v219[0] + 4) - 144;
std::stringbuf::~stringbuf(v220);
*(v219 + *(v219[0] + 4)) = &std::istream::`vftable';
*(&v218[11] + *(v219[0] + 4) + 4) = *(v219[0] + 4) - 24;
v221 = &std::ios_base::`vftable';
std::ios_base::_Ios_base_dtor(&v221);
v160 = 10i64;
v161 = 15i64;
v158 = *"-localonly";
v159 = *"ly";
BYTE2(v159) = 0;
```

The below histogram from Trellix shows the published victim count from April to November of 2023:



The below diagram from Trend Micro walks through many of the steps of a typical Akira attack:

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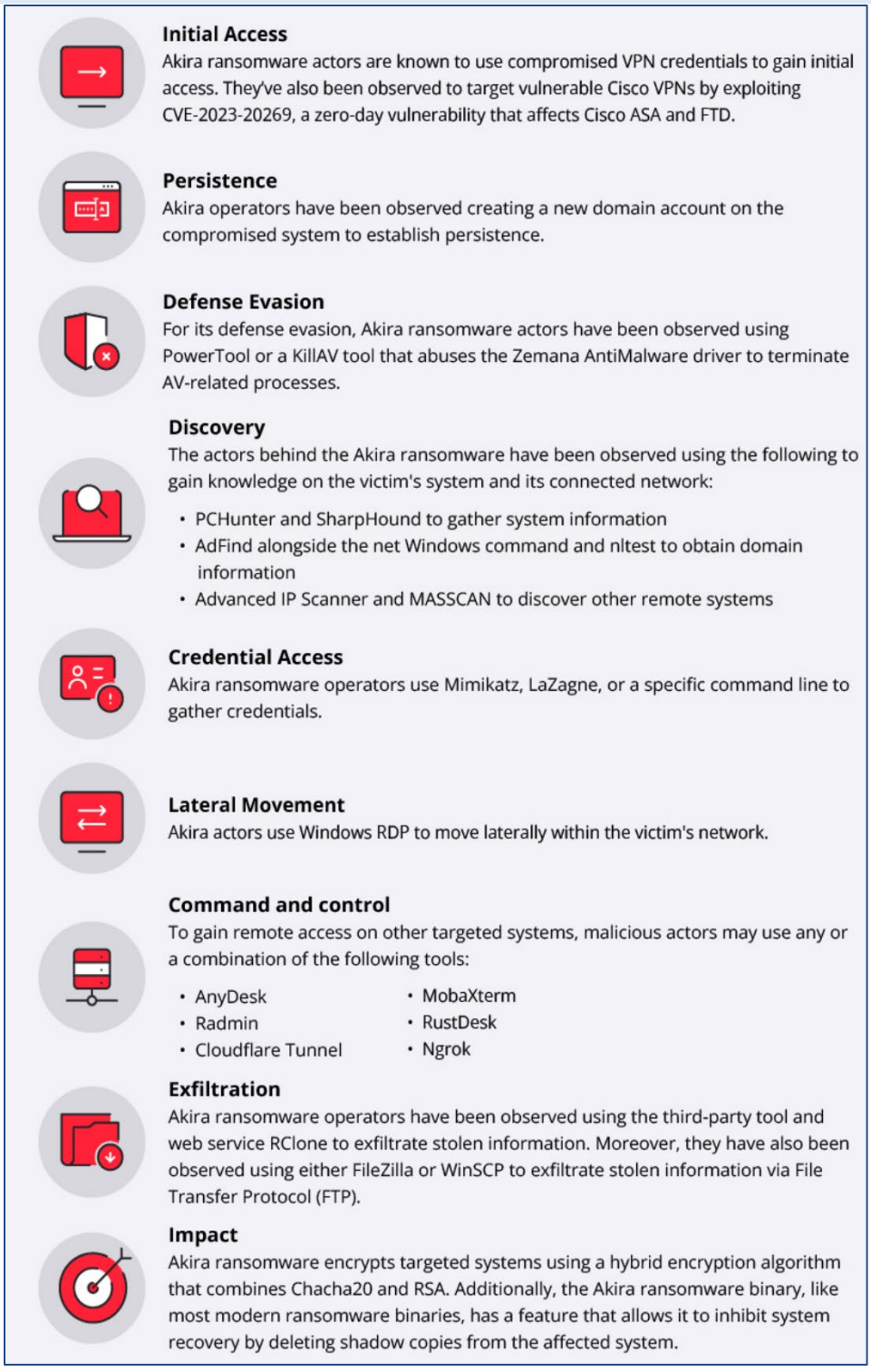

Global and U.S. targeting data from Trellix are contained in the two diagrams below:

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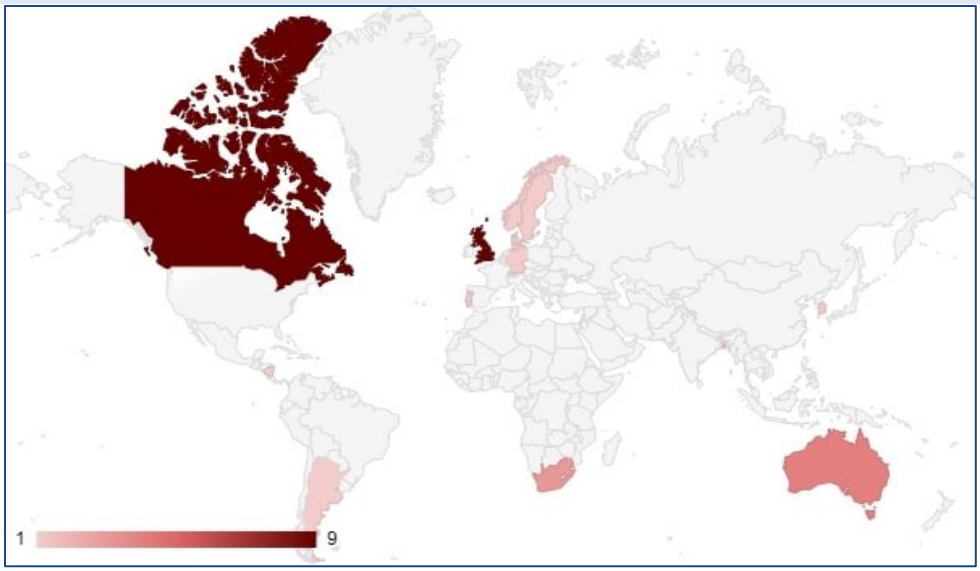

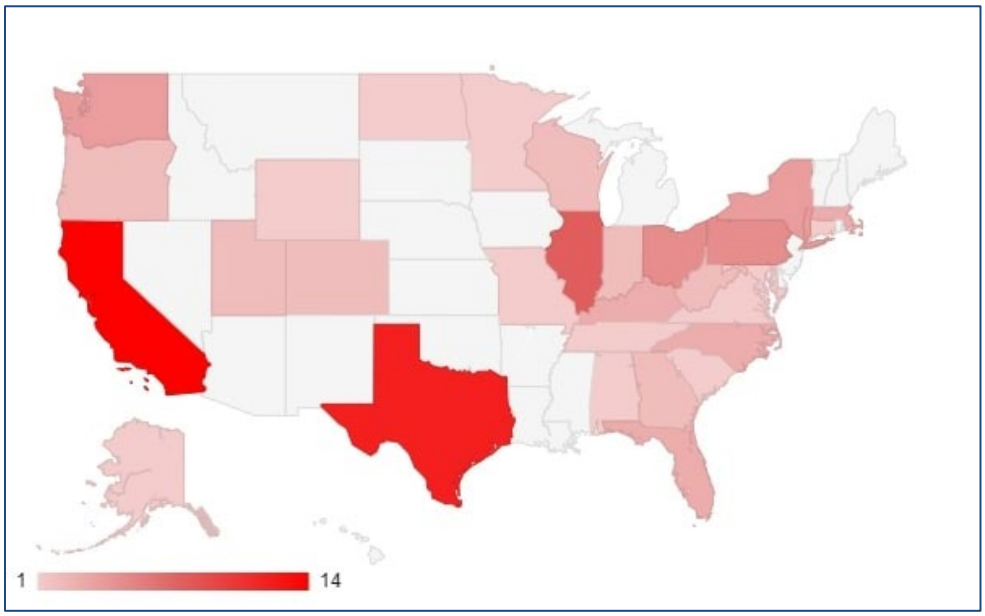

Contact Information

If you have any additional questions, we encourage you to contact us at HC3@hhs.gov.

We want to know how satisfied you are with the resources HC3 provides. Your answers will be anonymous, and we will use the responses to improve all future updates, features, and distributions. Share Your Feedback