

Aurora: The Dark Dawn and its Menacing Effects

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Aurora Stealer Background

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Aurora Stealer a non-friendly program in your neighborhood is developed in Go-lang. The malware was developed for threat actors to steal victims' sensitive data. Since its initial release, there have been many adaptations to the malware. It started as a botnet having info-stealer capabilities but currently it is a full-time info-stealer which is being sold by the threat actor labelled Cheshire on Russian speaking dark-net forums mentioned by cybersecurity firm Sekoia.

The malware has a knack for stealing the victim's browser data including cookies, passwords, login data and many more. It has the horizon to steal data from most browsers. The stealer also targets crypto wallets to pilfer victim's data. The malware does not stop here, it can exfiltrate files and data stored in different software from the victim's machine. Once all the super-sensitive data is possessed by the stealer it delivers the data to the attacker.

Operating Model

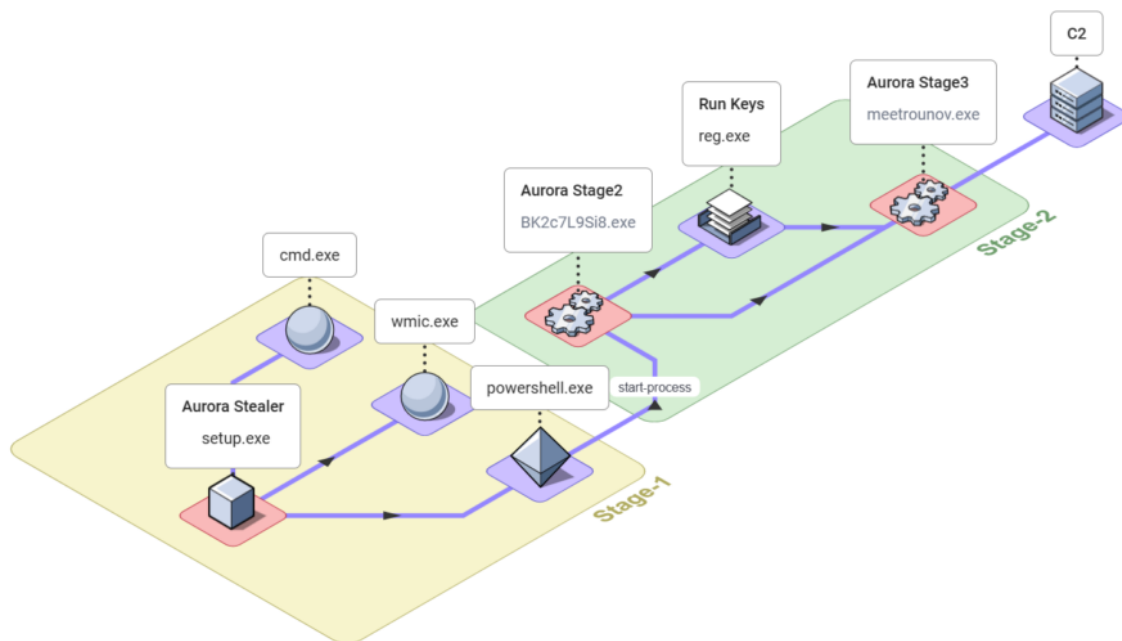
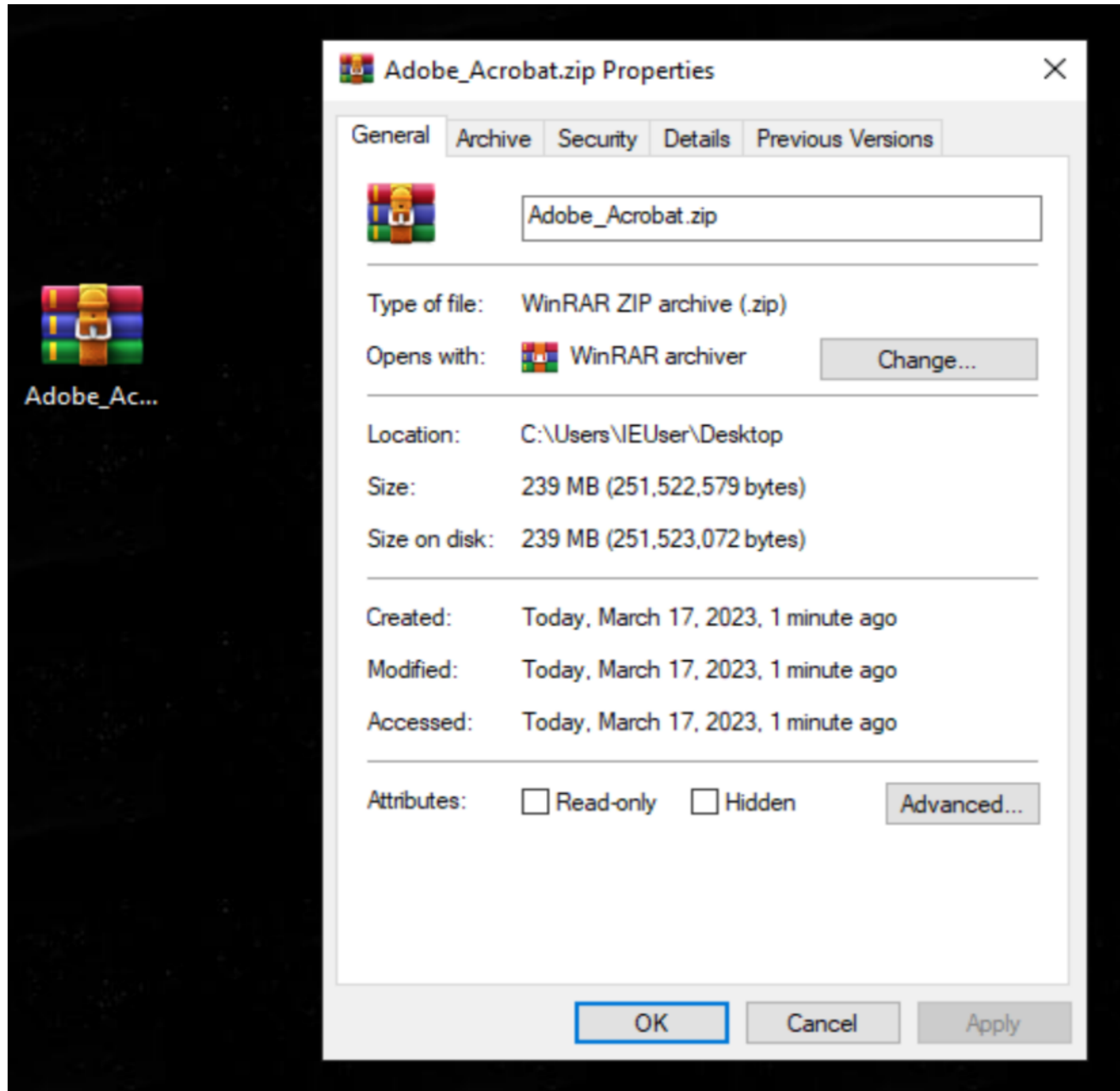


Figure 1: Attack Chain of Aurora Stealer

The malware is being spread among victims in the hospitality industry through phishing emails as seen by [Trendmicro](#). Besides phishing campaigns, the threat actors also have utilized SEO poisoning technique to deliver the malware via malicious ads of notepad++ according to [SANS](#) finding.

Upon the detonation of the malware, our observations revealed the implementation of multiple sophisticated techniques by the malware to evade detection by antivirus software. One such technique involved the incorporation of [binary padding](#), resulting in an increase in the file size allowing the malware to circumvent the antivirus software and evade detection.



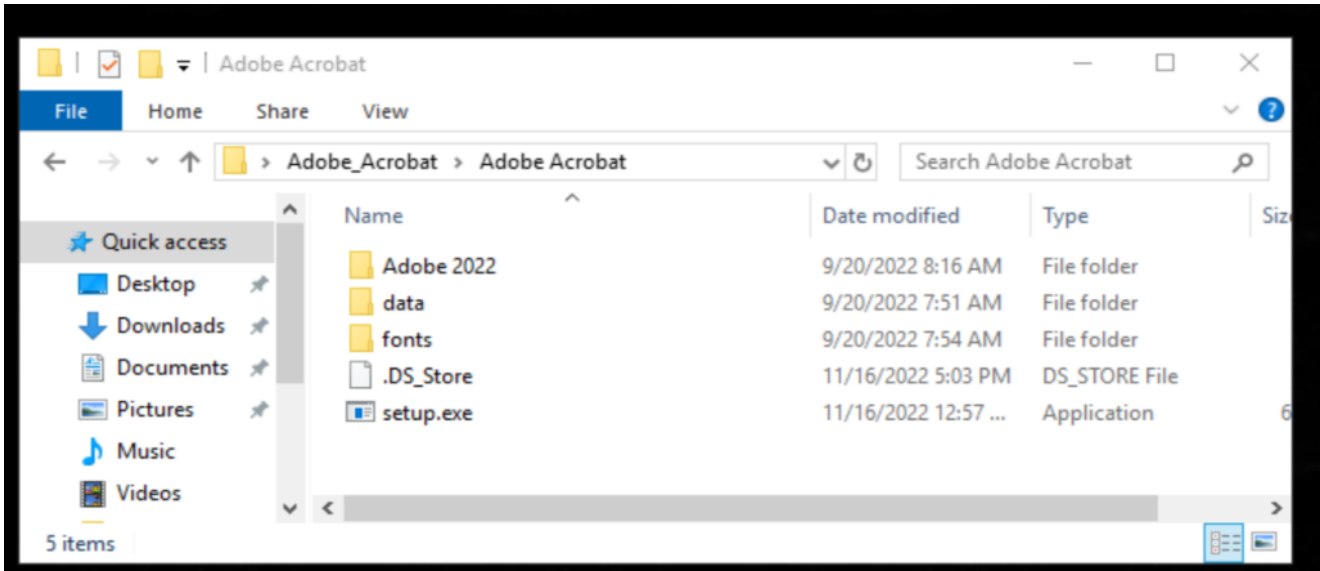


Figure2: Fake Adobe Acrobat Installer Downloaded from SEO Poisoning Campaign

After successful infiltration, the malware utilizes Windows Management Instrumentation (WMI) commands to gather pertinent system information. This behavior was consistently observed in all samples of Aurora stealer that we analyzed. Additionally, independent research conducted by [Cyble](#) and other industry experts has reported this observation.

process.parent.name	process.name	process.command_line
explorer.exe	setup.exe	"C:\Users\IEUser\Desktop\Adobe_Acrobat\Adobe Acrobat\setup.exe"
setup.exe	WMIC.exe	wmic os get Caption
setup.exe	cmd.exe	cmd /C "wmic path win32_VideoController get name"
setup.exe	cmd.exe	cmd /C "wmic cpu get name"

Figure2.1 : WMI Commands getting Executed

We also captured Aurora stealer's actions that were aimed at extracting sensitive information from files and folders located in various browsers, cryptocurrency wallets, and drives, as illustrated below.

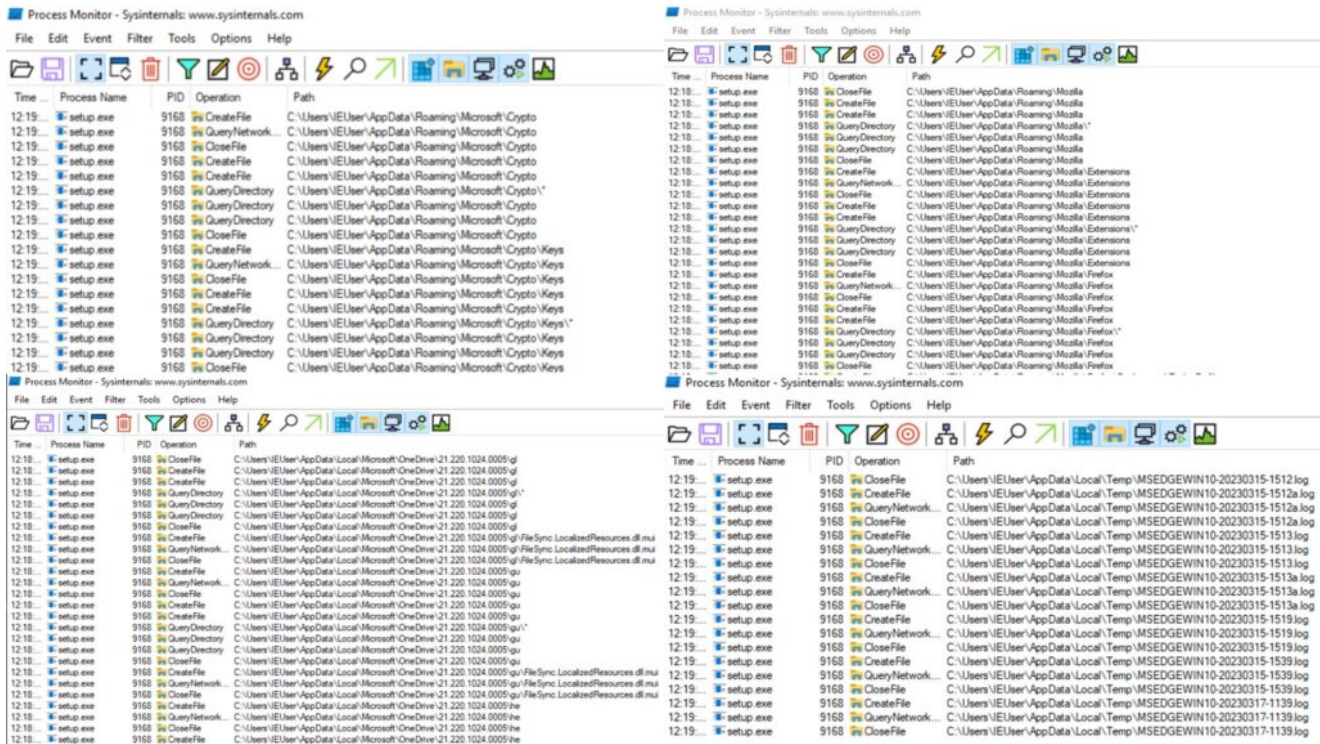


Figure3: Stealing Browser and Crypto Data

Aurora leverages PowerShell to facilitate the execution of its second stage, employing the following command:

```
powershell "" "start-process C:\Users\Admin\AppData\Local\Temp\BK2c7L9Si8.exe"
```

During the second stage of Aurora, an entry to the “run keys” in the registry was observed, enabling the malware to automatically execute its third stage DLL via RUNDLL32.exe at each user login.



Figure4: Run Key Added for DLL Execution

The third stage of the malware executes an encoded PowerShell command allowing it to delay execution for certain duration using the following command before it exfiltrates the data to the attacker.

```
C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe" -enc UwB0AGEAcgB0AC0AUwBsAGUAZQBwACAALQBTAGUAYwBvAG4AZABzACAAMwA0AA==
```

Once all the data and information are collected, the malware employs advanced encoding techniques to conceal the information and prepare it for shipment to the attacker over the C2 channel. The attacker can retrieve the encoded data and use it for nefarious purposes, such as identity theft or financial fraud.

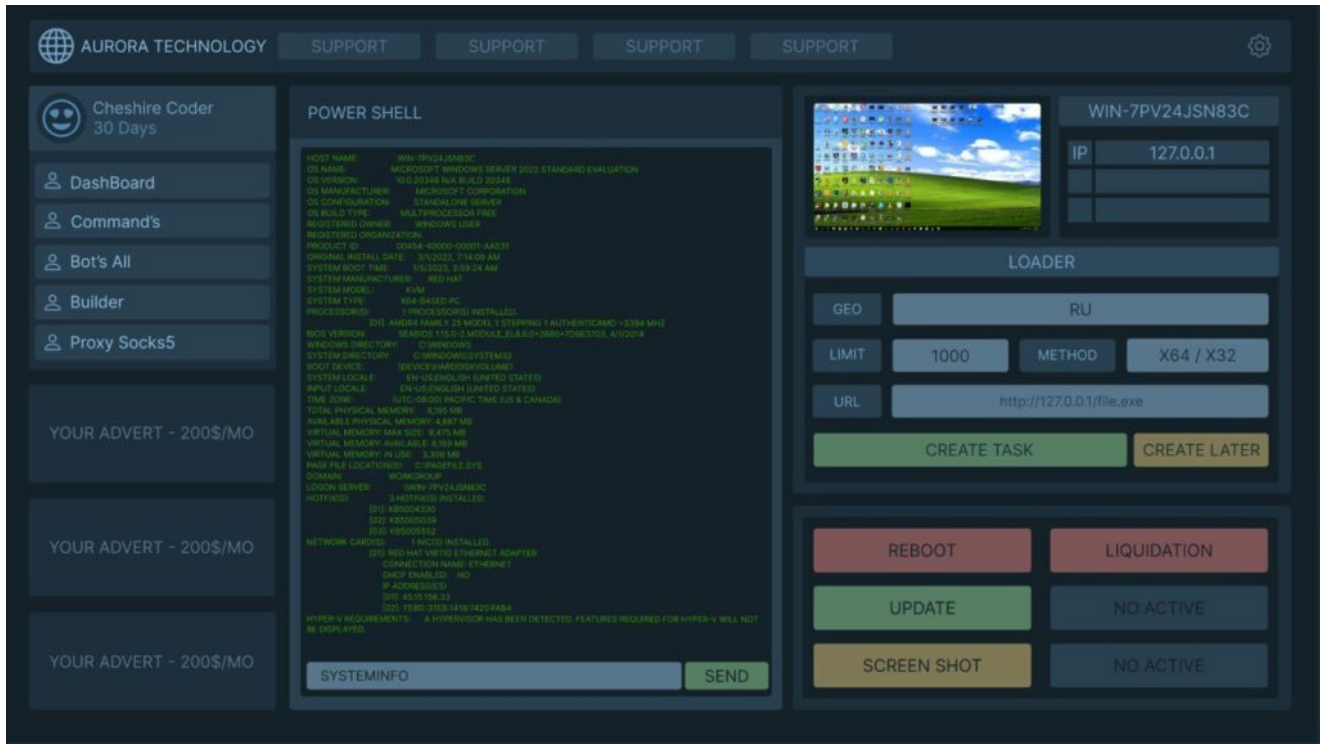


Figure5: C2 Panel; source: [twitter](#)

Detection

The infernal behavior of this malware can be detected using SIGMA rules.

To begin with, we attribute different WMI commands getting executed in sequence to detect Aurora Stealer malware.

```

logsource:
  category: process_creation
  product: windows
detection:
  selection:
    Image|endswith: '\wmic.exe'
  CommandLine|contains:
    - 'wmic os get Caption'
    - 'wmic path win32_VideoController get name'
    - 'wmic cpu get name'
  condition: selection
  
```

One detection would be to capture changes in 'run key' registry which execute DLL using RUNDLL32.exe

```
logsource:
  product: windows
  category: registry_set
detection:
  selection:
    EventType: SetValue
    TargetObject|contains:
      '\REGISTRY\MACHINE\Software\Microsoft\Windows\CurrentVersion\RunOnce'
    Details|re: .*rundll32.exe.C:\\\\Windows\\\\system32\\\\advpack.dll,DelNodeRunDLL32
      \\\"C:\\\\Users\\\\\\.*\\AppData\\\\Local\\\\Temp\\\\IXP[0-9]{1,3}.TMP.*
    condition: selection
```

Based on the general behavior followed by Aurora and different malwares, we have developed several detection methods. We also observed changes in the configuration of Windows Defender, where the path 'C:\Program Data' is excluded.

```
logsource:
  product: windows
  category: registry_set
detection:
  selection:
    EventType: SetValue
    TargetObject|contains: '\Microsoft\Windows Defender\Exclusions'
    Details: 'C:\Program Data\'
    condition: selection
```

Another detection would be by tracing event id `5007`, which can be activated by enabling Windows Defender operation logs. This particular event is triggered whenever there is a modification made to the configuration of Microsoft Defender Antivirus.

```
logsource:
  product: windows
  service: windefend
detection:
  selection:
    EventID: 5007
    NewValue|contains: 'C:\Program Data\'
    condition: selection
```

Additionally, one clever way to detect this malware is to monitor the execution of obfuscated PowerShell commands.

The same campaign can be detected using OSQUERY rules. Below are some rules that will help you keep your organization safe.

```

query_wmic:
    SELECT name,
           pid,
           cmdline,
           path,
           parent
    FROM processes
    WHERE LOWER(name) = 'wmic.exe'
    AND
    (
        cmdline LIKE '%OS Get Caption%'
        OR cmdline LIKE '%path win32_VideoController get name%'
        OR cmdline LIKE '%cpu get name%'
    );
query_registry:
    SELECT key,
           path,
           name,
           type,
           data
    FROM registry
    WHERE path LIKE
'HKEY_LOCAL_MACHINE\\Software\\Microsoft\\Windows\\CurrentVersion\\RunOnce\\%'
    AND data LIKE '%rundll32.exe C:\\Windows\\system32\\advpack.dll,De1NodeRunDLL32
"C:\\Users\\%%\\AppData\\Local\\Temp\\IXP%.TMP\\%' ;
query_exclusion:
    SELECT key,
           path,
           name,
           type,
           data
    FROM registry
    WHERE path LIKE 'HKEY_LOCAL_MACHINE\\SOFTWARE\\Microsoft\\Windows
Defender\\Exclusions\\Paths\\%'
    AND
    (
        data LIKE '%c:\\programdata%'
        OR data LIKE '%\\appdata\\roaming\\microsoft\\windows\\start menu\\programs\\startup%'
    )

```

For more threat analytics reach us [here](#).

The above rules have been vindicated by simulating [Aurora stealer](#) in a sandbox environment.

MITRE ATT&CK Techniques

Tactic	Technique ID	Technique Name
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Execution	<u>T1204</u> <u>T1059.001</u> <u>T1059.003</u> <u>T1047</u>	User Execution Command and Scripting Interpreter: PowerShell Command and Scripting Interpreter: Windows Command Shell Windows Management Instrumentation
Persistence	<u>T1547.001</u>	Boot or Logon Autostart Execution: Registry Run Keys / Startup Folder
Defense Evasion	<u>T1562.001</u> <u>T1027</u> <u>T1218.011</u> <u>T1497</u>	Impair Defenses Obfuscated Files or Information System Binary Proxy Execution: Rundll32 Virtualization/Sandbox Evasion
Credential Access	<u>T1555.003</u> <u>T1056</u> <u>T1003</u> <u>T1528</u> <u>T1539</u> <u>T1552.002</u>	Credentials from Password Stores: Credentials from Web Browsers Input Capture OS Credential Dumping Steal Application Access Token Steal Web Session Cookie Credentials in Registry
Discovery	<u>T1087</u> <u>T1083</u> <u>T1012</u> <u>T1082</u> <u>T1518.001</u> <u>T1614</u> <u>T1497</u>	Account Discovery File and Directory Discovery Query Registry System Information Discovery Software Discovery: Security Software Discovery System Location Discovery Virtualization/Sandbox Evasion
Collection	<u>T1119</u> <u>T1005</u> <u>T1056</u> <u>T1113</u>	Automated Collection Data from Local System Input Capture Screen Capture
Command and Control	<u>T1071.001</u> <u>T1105</u> <u>T1095</u> <u>T1571</u>	Application Layer Protocol: Web Protocols Ingress Tool Transfer Non-Application Layer Protocol Non-Standard Port

Threat Bites

Threat Actor

Targeted Country

Targeted Industry

First Seen

Last Seen

LOLBAS

Telemetry

Samples

:

:

:

:

:

:

:

:

Unknown

Worldwide

Hotels

April 2022

March 2023

Wmic, Reg, Rundll32

Sysmon, Security, Windefend, PowerShell

<https://tria.ge/230118-f1ewcaac94/behavioral1>

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