Malware Analysis Report

SOC ACADEMY

Prepared by GROUP 4

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Executive Summary

A suspicious file was identified on a company workstation, triggering a malware analysis to assess its behavior and potential impact. Through static analysis, the file was found to display multiple indicators of malicious activity, including abnormal file properties, unexpected library dependencies, and hidden or irregular data structures. These initial red flags were validated by dynamic analysis, which revealed that the file engages in harmful operations such as creating or modifying files, altering system registry keys, and attempting to connect with external servers. It also initiates additional processes and incorporates persistence techniques to maintain its presence on the system. Collectively, these behaviors confirm the file as malware, posing a serious threat to system security and data confidentiality.

Static Analysis

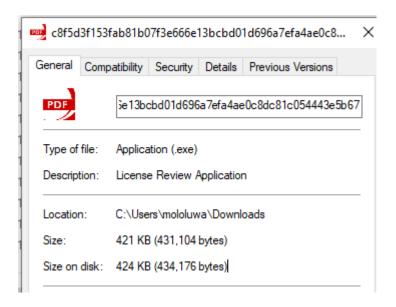
Static analysis is the process of analyzing a file, program, or code without running it to detect signs of malicious behavior, suspicious structures, or potential vulnerabilities. It involves inspecting elements like file metadata, strings, libraries, and code logic to assess risk before execution, and single out indicators of Compromise (Iocs)

Initial Examination

Starting off with metadata analysis by simply inspecting the properties of the file we can see that the file type is an application file with the .exe extension making it an executable application file

And in the description it says that it is a license review application

The size of the file is 421kb(431,104 bytes)but the size on disk is 424kb (434,176 bytes)
This doesn't indicate much as the slight difference in size is probably due to how disk storage is allocated



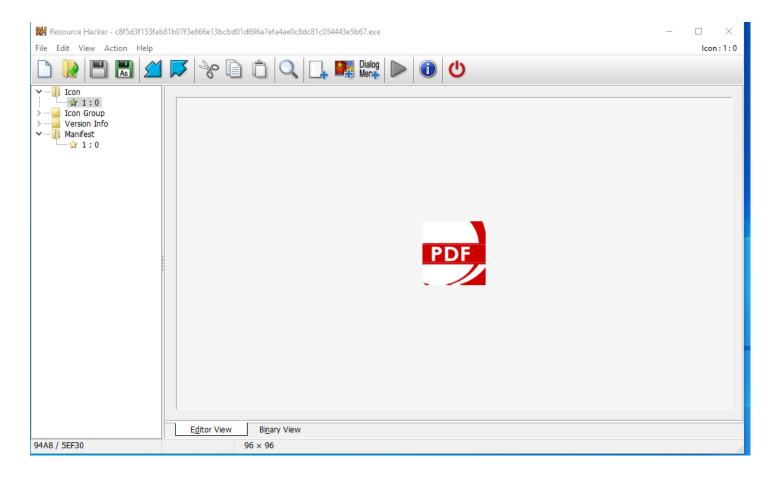
Also using pestudio I was able to find the compilation date of the file to be may 03 2025 Also it showed a high entropy of 7.640 which indicates that the file is probably obfuscated also more information about the file type was uncovered with pe studio here we can see that it is a 32 bit executable file with a gui

tamps	
tamp > compiler	Sat May 03 03:17:23 2025 (UTC)
L \ -l	-/-
property	value
file	
file > sha256	C8F5D3F153FAB81B07F3E666E13BCBD01D696A7EFA4AE0C8DC81C054443E5B67
file > first 32 bytes (hex)	4D 5A 90 00 03 00 00 00 04 00 00 0F FF 00 00 B8 00 00 00 00 00 00 40 00 00 00 00 00 00
file > first 32 bytes (text)	MZ@
file > info	size: 431104 bytes, entropy: 7.640
file > type	executable, 32-bit, GUI

Resource Hacker was utilized to explore the file's internal components, including icons, version details, and any embedded data. The analysis uncovered several suspicious elements, such as

• A deceptive PDF-style icon embedded in the executable — a classic social engineering technique used to trick users into believing the file is a legitimate document.

• An unusual icon and version information labeling the file as a "License Review Application," with server1.exe listed as both the original and internal filename.



```
Resource Hacker - c8f5d3f153fab81b07f3e666e13bcbd01d696a7efa4ae0c8dc81c054443e5b67.exe
                                                                                                                                                                                                                                                                                                    П
 File Edit View Action Help
                                                                                                                                                                                                                                                                                            Version Info: 1:0
 Y ····· 📗 Icon
                                                                    1 VERSIONINFO
               · 1:0
                                                                    FILEVERSION 1,7,5,9
      --- Icon Group
                                                                   PRODUCTVERSION 1,7,5,9
               32512:0
                                                              5 FILEOS 0x4
        Version Info
                                                                  FILETYPE 0x1
              · 🛊 1:0

✓ ····· III Manifest

                                                              8 BLOCK "StringFileInfo"
            ······ 😭 1:0
                                                            10
11
                                                                                 BLOCK "000004b0"
                                                                                              VALUE "Comments", "Important License Files"
VALUE "CompanyName", "License Review Application"
VALUE "FileDescription", "License Review Application"
VALUE "FileVersion", "1.7.5.9"
VALUE "InternalName", "server1.exe"
VALUE "LegalTrademarks", "All Right Reserved License Review Application"
VALUE "OriginalFilename", "server1.exe"
VALUE "OriginalFilename", "server1.exe"
VALUE "ProductName", "License Review Applications"
VALUE "ProductVersion", "1.7.5.9"
VALUE "Assembly Version", "2.9.7.8"
                                                             12
                                                             13
                                                             14
                                                            15
16
                                                            18
19
                                                             20
                                                            21
22
                                                            23
24 }
                                                             25
                                                            26 BLOCK "VarFileInfo"
27 {
                                                             28
                                                                                 VALUE "Translation", 0x0000 0x04B0
                                                            29 }
                                                                                                   Binary View
                                                                     Editor View
44C / 683EC
```

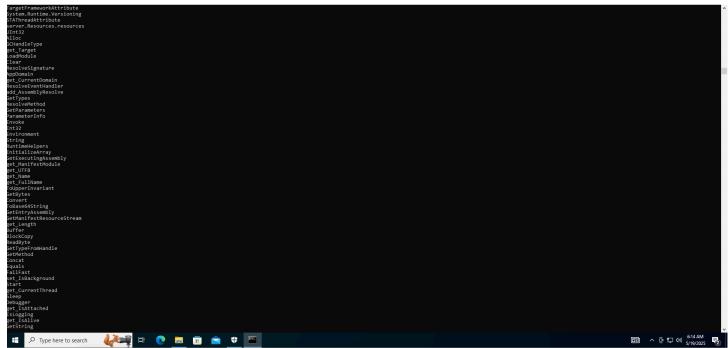
Strings Analysis

Running the strings tool on the malware sample revealed several indicators of potentially malicious behavior. The file is an executable, and the extracted strings suggest the use of obfuscation and reflection techniques. Key indicators include:

- **Base64String**: Shows the malware uses Base64 encoding to hide data or code from easy detection.
- **AppDomain:** A .NET feature that lets malware load and run code separately to stay hidden.
- **AssemblyResolve**: Used to load hidden code or modules during runtime, making detection harder.
- FailFast: Makes the program crash immediately to avoid being analyzed or debugged.
- **GCHandle:** Helps the malware keep code in memory to run it without leaving traces on disk.

These indicators reflect common malware tactics like code obfuscation, dynamic loading, and anti-analysis measures designed to avoid detection and maintain persistence.

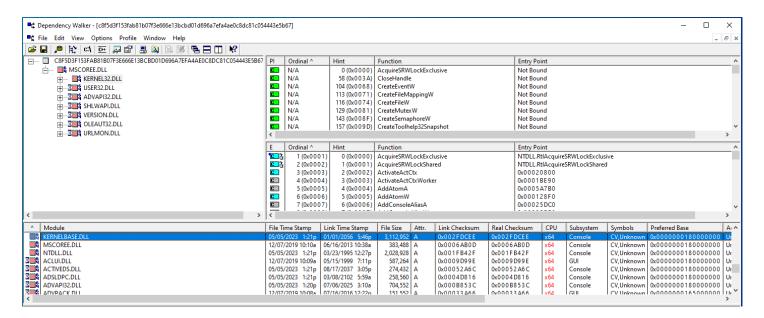




Dependencies Analysis

Dependency Walker was used to examine the libraries required by the malware "c8f5d3f153fab81b07f3e666e13bcbd01d696a7efa4ae0c8dc81c054443e5b67.exe"The analysis revealed the following dependencies:

- **ADVAPI32.DLL:** Used to access the registry and manage system services common for persistence and privilege abuse.
- **KERNEL32.DLL:** Enables the malware to perform core system actions like file creation, memory management, and process execution.
- URLMON.DLL: Handles URL and file downloads, often used to fetch payloads or communicate with C2 servers.
- **MSCOREE.DLL**: Loads .NET assemblies, indicating the malware is a .NET executable with potential for obfuscation and dynamic code execution.



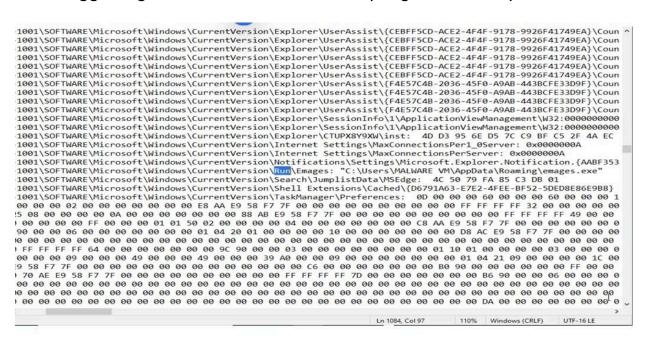
Dynamic Analysis

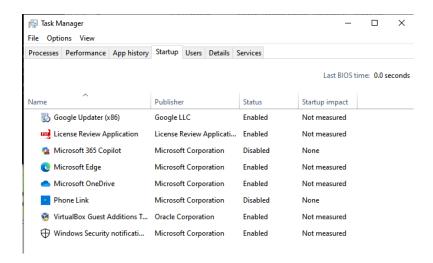
Dynamic analysis was performed by running the suspicious file in a secure, isolated environment to monitor its behavior and system interactions. This method reveals real-time actions the file attempts during execution, offering valuable insights into its malicious intent. The tools listed below were used to analyze the behavior of the malware. "c8f5d3f153fab81b07f3e666e13bcbd01d696a7efa4ae0c8dc81c054443e5b67.exe":

- ProcMon (Process Monitor)
- Regshot
- Wireshark
- FakeNet-NG

Behavioral Analysis

• **Registry Activity:** Regshot was utilized to take system registry snapshots before and after executing the malicious file, Comparing these snapshots revealed key changes, suggesting that the executable is attempting to establish persistence on the system.





The Startup tab in Task Manager shows that the suspicious "License Review Application" which is the malware is enabled, suggesting it is configured to launch at system boot, so as to achieve persistence

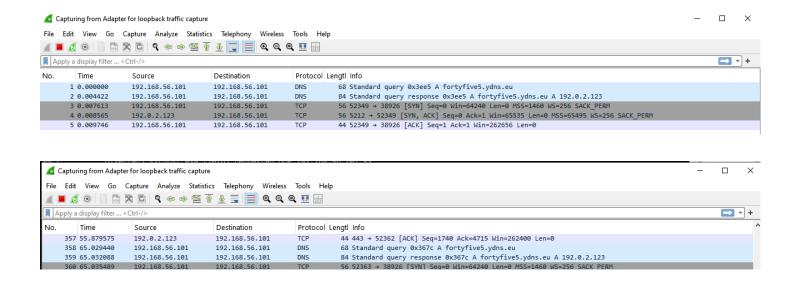
Network Analysis

Wireshark and fakenet ng was used to monitor network activity after successfully executing the malware, Wireshark was used to monitor network activity for any suspicious activity while fakenet was used to simulate a network environment and intercept network requests initiated by the malware

"c8f5d3f153fab81b07f3e666e13bcbd01d696a7efa4ae0c8dc81c054443e5b67.exe"

Through the combination of both we were able to identify multiple suspicious dns requests to the domain "fiftyfive5.ydns.eu."

```
19/25 02:51:03 PM
19/25 02:51:03 PM
19/25 02:51:03 PM
19/25 02:51:03 PM
                                                  HTTPListener443
                                                  HTTPListener443
                                                                                      svchost.exe (2016) requested UDP 192.168.56.101:53
Received A request for domain 'kv601.prod.do.dsp.mp.microsoft.com' from svchost.exe (2016)
svchost.exe (3064) requested TCP 192.0.2.123:443
GET /all?doclientVersion=10.0.19041.2546&countryCode=NG&profile=1114368&eid=6&CacheHost=196.49.32.6&CacheId=7 HTTP/1.1
                                                            Diverter
DNS Server
 19/25 02:51:03 PM
                                                               Diverter
 19/25 02:51:03 PM
19/25 02:51:03 PM
                                                 HTTPListener443
HTTPListener443
                                                                                           Connection: Keep-Alive Accept: */*
 19/25 02:51:03 PM
19/25 02:51:03 PM
                                                 HTTPListener443
HTTPListener443
                                                                                           Accept-Encoding: gzip, deflate
User-Agent: Microsoft-Delivery-Optimization/10.0
 19/25 02:51:03 PM
19/25 02:51:03 PM
                                                  HTTPListener443
HTTPListener443
                                                                                           MS-CV: TXJrBW2NKU2YBMUa.24.1.1
Content-Length: 0
 19/25 02:51:03 PM
19/25 02:51:03 PM
                                                  HTTPListener443
HTTPListener443
                                                                                           Host: kv601.prod.do.dsp.mp.microsoft.com
 19/25 02:51:03 PM
19/25 02:51:10 PM
                                                  HTTPListener443
                                                                                      svchost.exe (2016) requested UDP 192.168.56.101:53
                                                               Diverter
                                                            DIVERTORS SERVE (2016) Requested UDP 192.108.30.101:53
DNS Server] Received PTR request for domain '251.08.224.in-addr.arpa' from svchost.exe (2016)
DNS Server] Received PTR request for domain '1.56.168.192.in-addr.arpa' from svchost.exe (2016)
Diverter] System (4) requested UDP 192.168.56.1:137
Diverter] svchost.exe (2016) requested UDP 192.168.56.101:53
DNS Server] Received A request for domain 'fortyfive5.ydns.eu' from svchost.exe (2016)
Diverter] c8f5d3f153fab81b07f3e666e13bcbd01d696a7efa4ae0c8dc81c054443e5b67.exe (12740) requested TCP 192.0.2.123:5212
 19/25 02:51:10 PM
19/25 02:51:10 PM
                                                           DNS Server]
DNS Server]
  19/25 02:51:10 PM
 19/25 02:51:13 PM
/19/25 02:51:13 PM
/19/25 02:51:13 PM
```

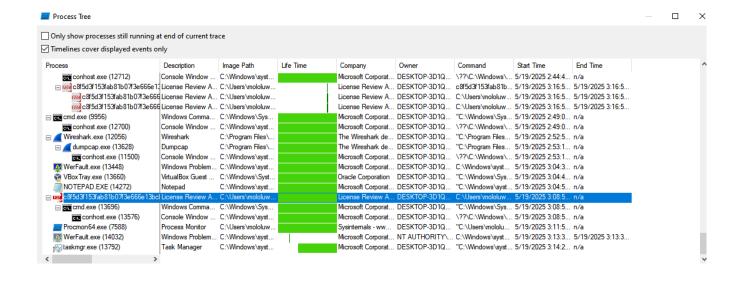


- Captured DNS traffic shows repeated requests to the suspicious domain fiftyfive5.ydns.eu, with responses resolving to 192.0.2.123, a non-routable address used by FakeNet-NG for redirection. This behavior suggests the malware is attempting to simulate or initiate command and control (C2) communication.
- 2. This activity indicates that the malware is trying to initiate command and control (C2) communication with a remote host with domain "fiftyfive5.ydns.eu"

System Activity Analysis

Using Procmon we monitored the process list after executing the malware and we noticed a couple of indicators which revealed that

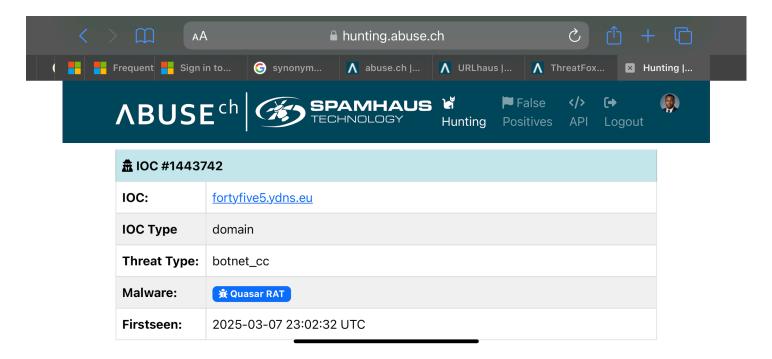
- New processes were spawned
- The process tree highlights multiple instances or the malware c8f5d3f153fab81b07f3e666e13bcbd01d696a7efa4ae0c8dc81c054443e5b67.exe repeatedly relaunching itself which in its own might suggest persistence



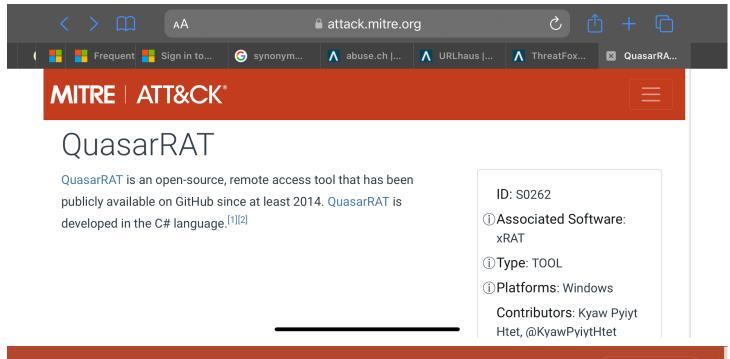
The domain fortyfive5.ydns.eu was flagged as malicious by 15 security vendors VirusTotal



A lookup on fortyfive5.ydns.eu via Abuse.ch ThreatFox confirms its association with Quasar RAT and identifies it as an active botnet C2 server. Its classification under malware infrastructure validates the suspicious external network activity observed during local analysis.



A MITRE ATT&CK screenshot highlights that QuasarRAT is a widely used, open-source remote access tool (ID: S0262) developed in C#. It has been employed by several known threat groups, including Patchwork (G0040), LazyScripter (G0140), Gorgon Group (G0078), Kimsuky (G0094), menuPass (G0045), and BackdoorDiplomacy (G0135), underscoring its prevalence in real-world cyberattacks.



MITRE | ATT&CK°



ID	Name	References
G0040	Patchwork	[3][2]
G0140	LazyScripter	[6]
G0078	Gorgon Group	[7]
G0094	Kimsuky	[8][9]
G0045	menuPass	[10][11][4]
G0135	BackdoorDiplomacy	[12]

Recommended Mitigation

- Quarantine all affected systems: Immediately disconnect the compromised workstation from the network to halt any ongoing malicious activity and prevent lateral movement.
- Securely eliminate the malicious file: Locate and permanently delete the file c8f5d3f153fab81b07f3e666e13bcbd01d696a7efa4ae0c8dc81c054443e5b67.exe, using secure deletion tools to ensure it cannot be recovered.
- Conduct a comprehensive malware scan: Run a full system scan using a trusted antivirus or EDR solution to uncover and remove any additional malicious components or artifacts.
- Monitor and restrict network traffic: Enable continuous network traffic analysis and apply firewall rules or DNS filtering to block connections to the identified C2 domain fiftyfive5.ydns.eu.
- Apply critical system updates: Ensure the operating system, software, and security tools are fully patched to mitigate known vulnerabilities and reduce the attack surface.
- Initiate user awareness programs: Provide regular training to employees on identifying phishing attempts, malicious attachments, and unsafe downloads.
- Audit system and user activity logs: Review Windows Event Logs and endpoint
 activity to identify any unusual behavior that may indicate further compromise.
- **Deploy endpoint detection and response (EDR):** Consider deploying EDR solutions for real-time threat detection, automated response, and deeper visibility into endpoint activities.