New Conversation Hijacking Campaign Delivering IcedID

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March 28, 2022

Written by Joakim Kennedy and Ryan Robinson - 28 March 2022

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This post describes the technical analysis of a new campaign detected by Intezer's research team, which initiates attacks with a phishing email that uses conversation hijacking to deliver IcedID.

The underground economy is constantly evolving with threat actors specializing in specific fields. One field that has bloomed in the last few years is initial access brokers. Initial access brokers specialize in gaining an initial beachhead access to organizations and once achieved, sell the access to other threat actors that monetize it further.

Some of the customers to initial access brokers buy the access to deploy ransomware. Proofpoint has identified ten access brokers that sell access to ransomware groups. These access brokers largely infect their victims with banking trojans that are later used to deploy another malware at the "purchaser's request."

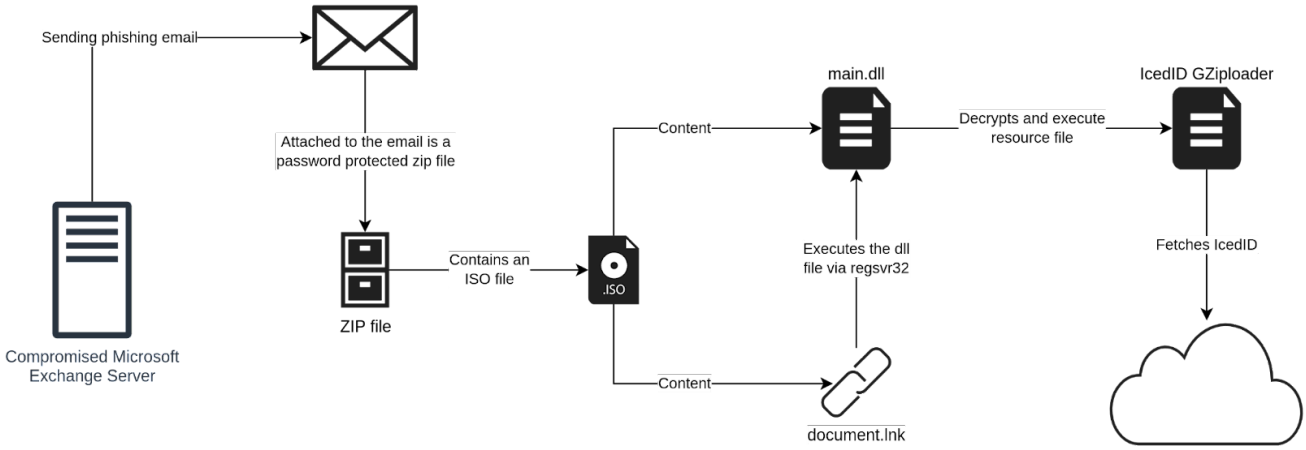
One of these banking trojans that have been used to deploy ransomware is IcedID (BokBot). IcedID was first reported on by IBM X-Force in November 2017 and the malware shared some code with Pony. While initially designed to steal banking credentials, like

many other banking trojans, the malware has been repurposed for deploying other malware on the infected machines.

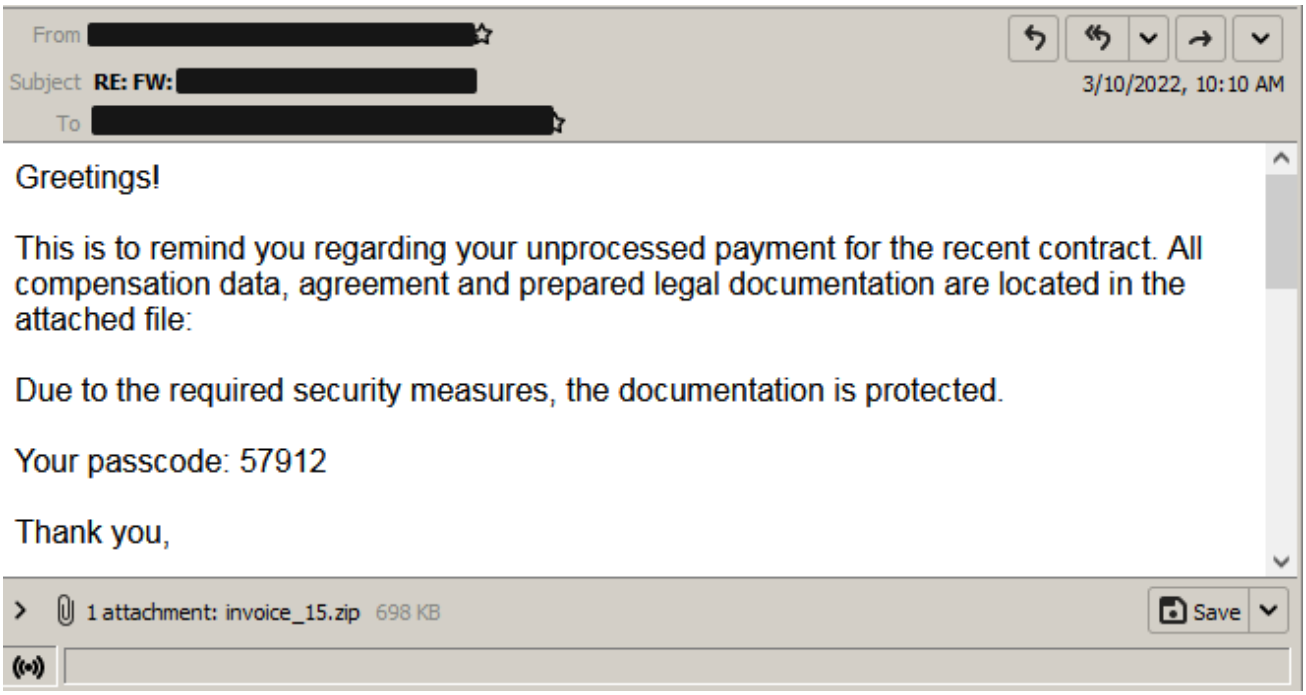
One way IcedID infects machines is via phishing emails. The infection chain that commonly has been used is an email with an attached password protected “zip” archive. Inside the archive is a macro enabled office document that executes the IcedID installer. Some phishing emails reuse previously stolen emails to make the lure more convincing.

In the new IcedID campaign we have discovered a further evolution of the threat actors’ technique. The threat actor now uses compromised Microsoft Exchange servers to send the phishing emails from the account that they stole from. The payload has also moved away from using office documents to the use of ISO files with a Windows LNK file and a DLL file. The use of ISO files allows the threat actor to bypass the Mark-of-the-Web controls, resulting in execution of the malware without warning to the user. **With regards to targeting, we have seen organizations within energy, healthcare, law, and pharmaceutical sectors.**

Infection Chain



The attack-chain starts with a phishing email. The email includes a message about some important document and has a password protected “zip” archive file attached. The password to the archive is given in the email body, as can be seen in the screenshot below. What makes the phishing email more convincing is that it’s using conversation hijacking (thread hijacking). **A forged reply to a previous stolen email is being used.** Additionally, the email has also been sent from the email account from whom the email was stolen from.



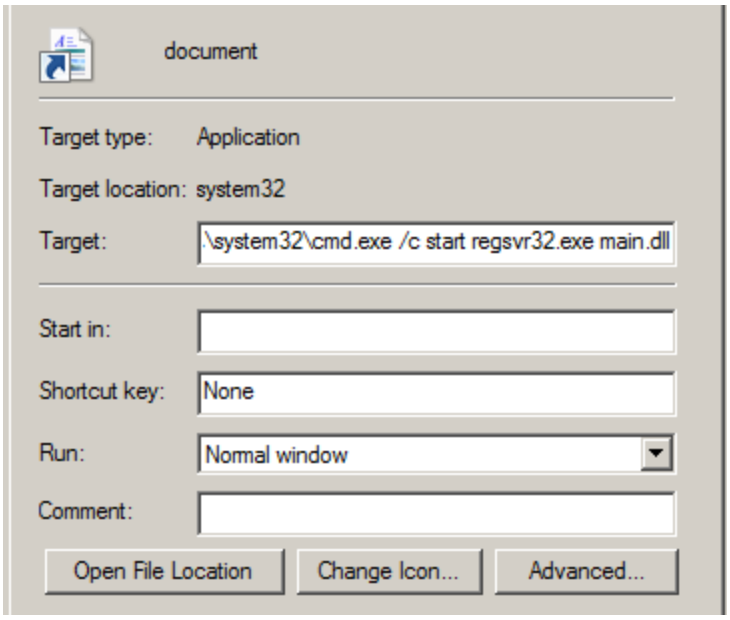
The content of the zip archive is shown in the screenshot below. It includes a single “ISO” file with the same filename as the zip archive. It can also be seen that the file was created not that long before the email was sent.

Name	Size	Packed Size	Modified	Created	Accessed
invoice_15.iso	1 271 808	714 748	2019-11-11 21:00	2022-03-10 09:24	2022-03-10 09:24

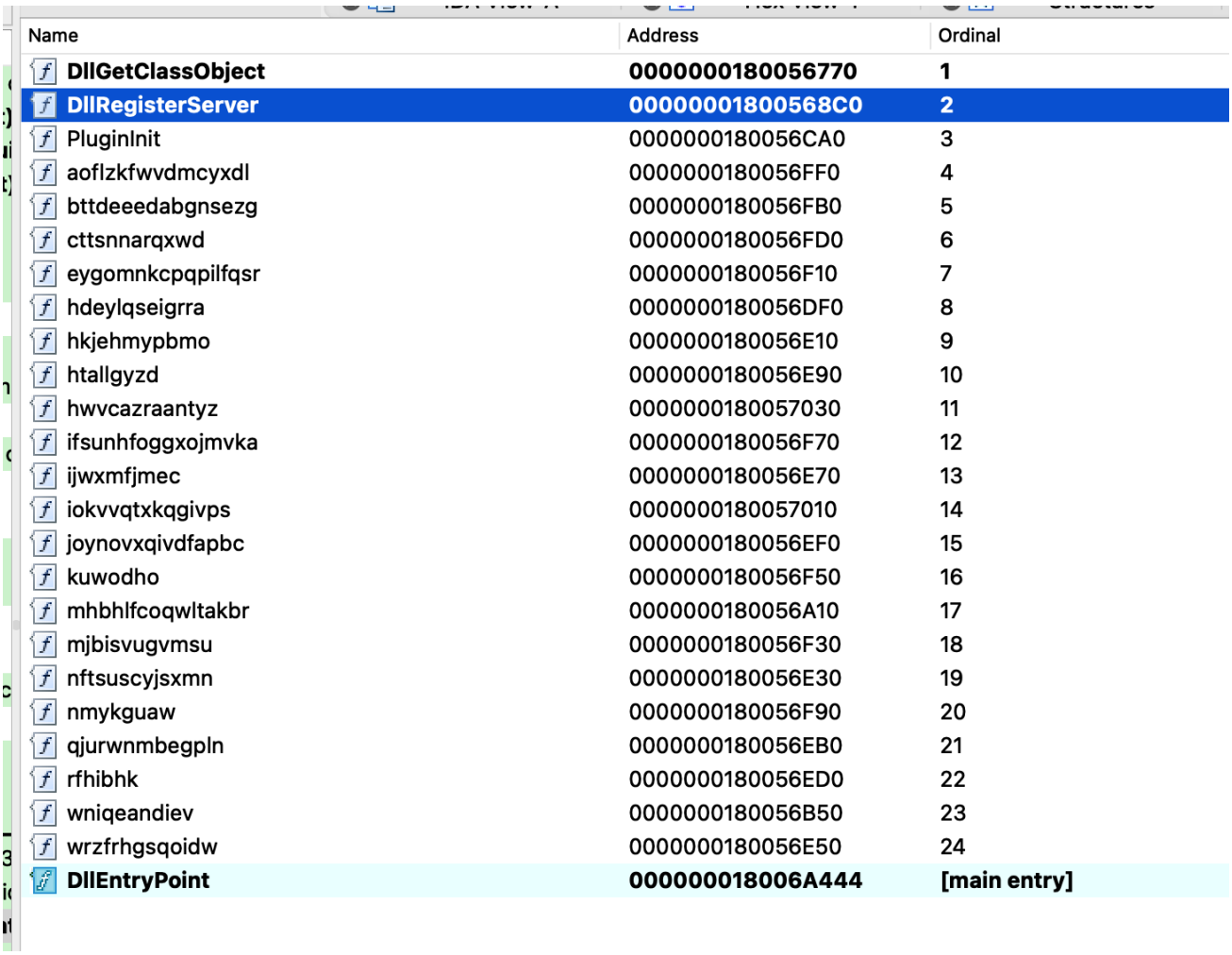
The ISO file includes two files, a LNK file named “document” and a DLL file named “main.” From the timestamps it can be concluded that the DLL file was prepared the day before while the LNK file was prepared about a week before. It is possible that the LNK file has been used in earlier phishing emails.

Name	Size	Packed Size	Modified
document.lnk	2 798	2 798	2022-03-03 18:35
main.dll	1 204 736	1 204 736	2022-03-09 16:26

The LNK file has been made to look like a document file via its embedded icon file. As can be seen in the screenshot below, when a user double clicks the link file, it uses “regsvr32” to execute the DLL file.

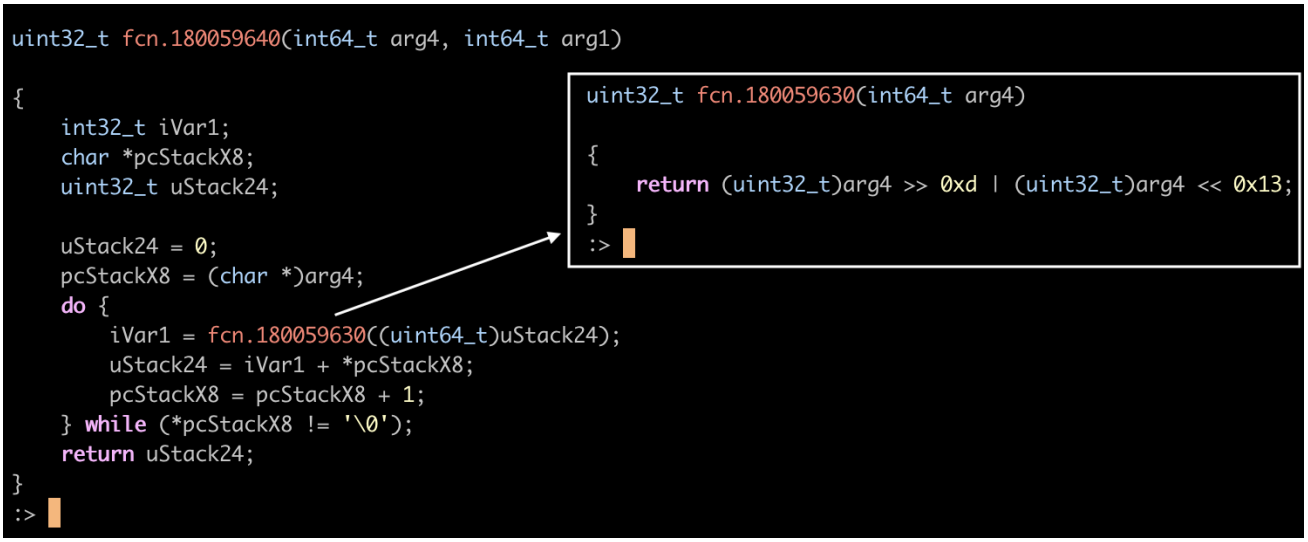


The use of regsvr32 allows for proxy execution of malicious code in **main.dll** for defense evasion. The DLL file is a loader for the IcedID payload. It contains a number of exports, most of which consist of junk code.

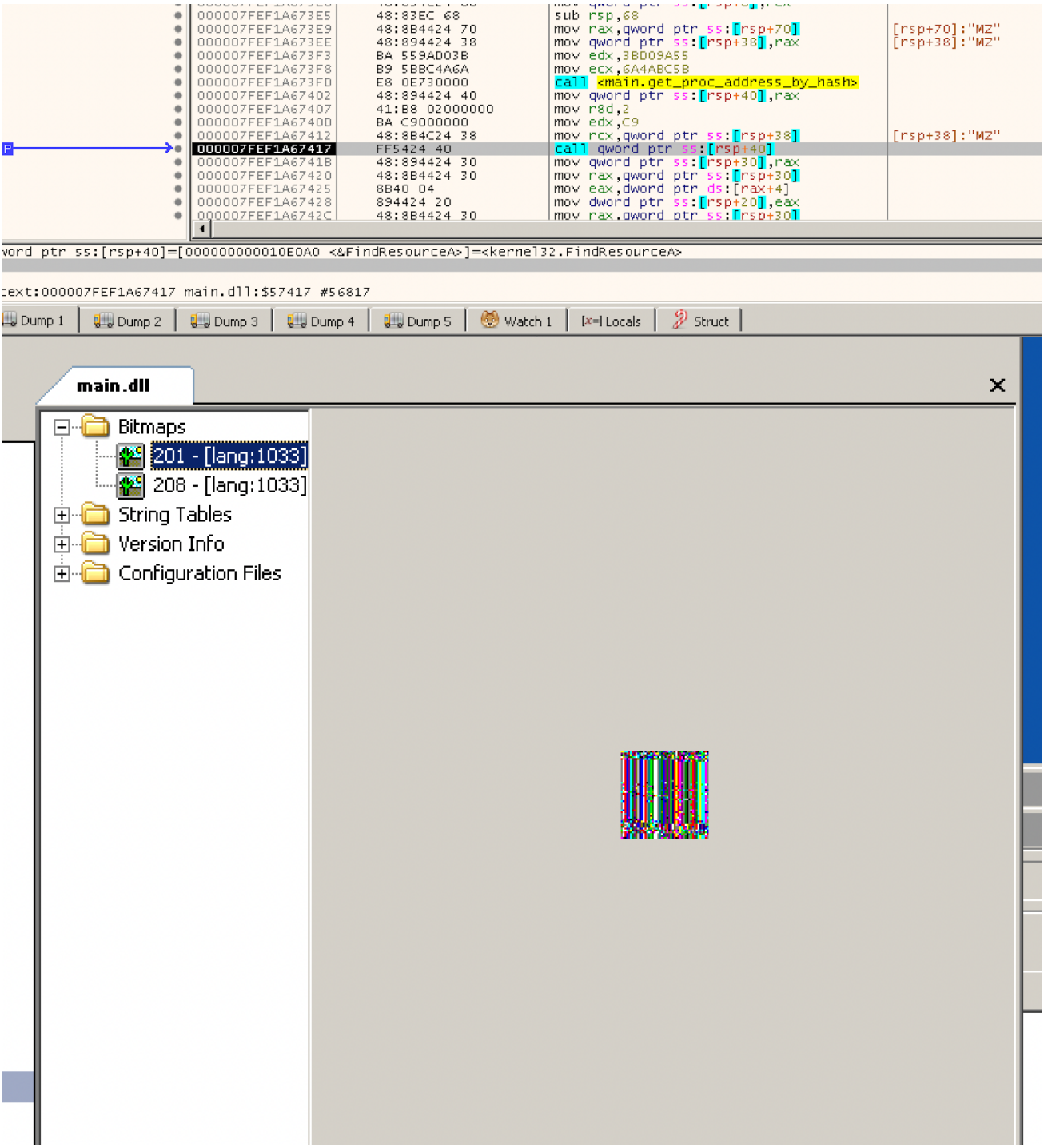


Name	Address	Ordinal
DllGetClassObject	**0000000180056770**	**1**
DllRegisterServer	**00000001800568C0**	**2**
PluginInit	0000000180056CA0	3
aoflzkfwvdmcyxdl	0000000180056FF0	4
bttdeeedabgnsezg	0000000180056FB0	5
cttsnnarqxwd	0000000180056FD0	6
eygomnkcpqpilfqsr	0000000180056F10	7
hdeylqseigrra	0000000180056DF0	8
hkjehmypbmo	0000000180056E10	9
htallgyzd	0000000180056E90	10
hwvcazraantyz	0000000180057030	11
ifsunhfoggxojmvka	0000000180056F70	12
ijwxmfjmec	0000000180056E70	13
iokvvqtxkqgivps	0000000180057010	14
joynovxqivdfapbc	0000000180056EF0	15
kuwodho	0000000180056F50	16
mhbhlfcoqwltakbr	0000000180056A10	17
mjbisvugvmsu	0000000180056F30	18
nftsuscyjsxmn	0000000180056E30	19
nmykguaw	0000000180056F90	20
qjurwnmbegpln	0000000180056EB0	21
rfhibhk	0000000180056ED0	22
wniqeandiev	0000000180056B50	23
wrzfrhgsqoidw	0000000180056E50	24
DllEntryPoint	**000000018006A444**	**[main entry]**

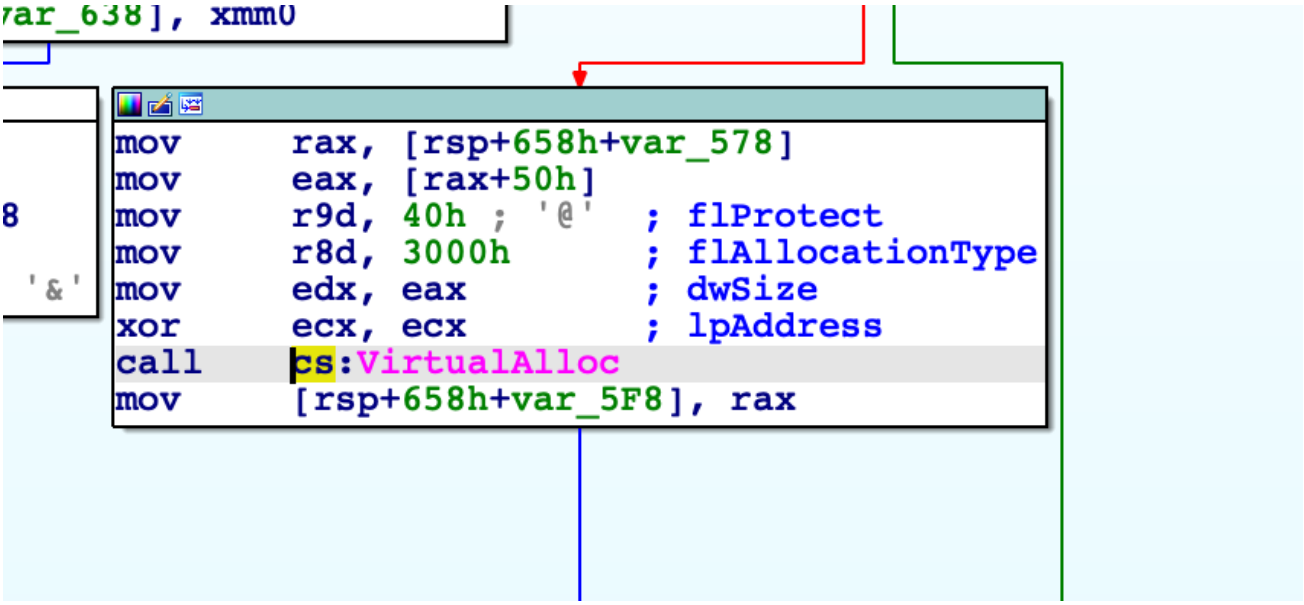
The loader will locate the encrypted payload, stored in the resource section of the binary. It does this through the technique *API hashing*. A decompilation of the simple hashing function is shown below.



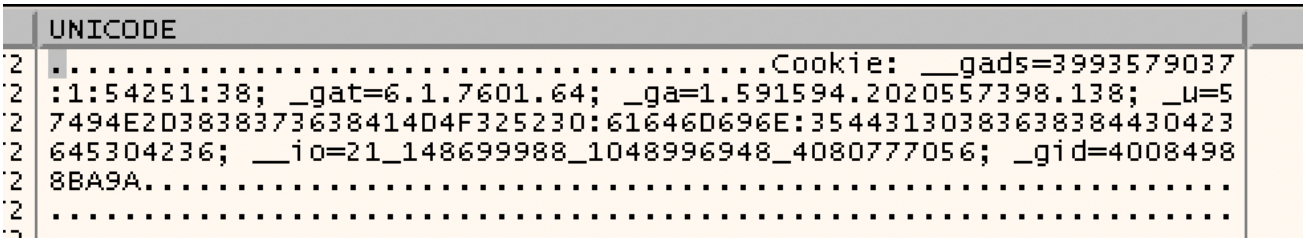
The resulting hash is then compared with a hardcoded hash, locating the call for **FindResourceA.** The function is dynamically called to fetch the payload.



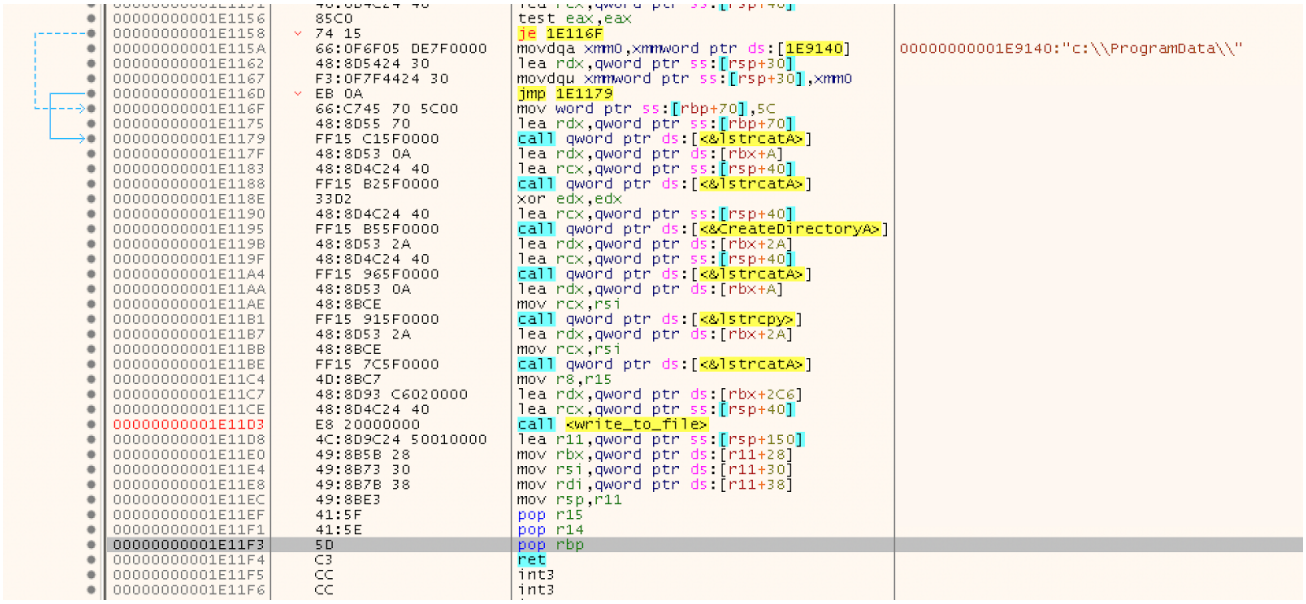
Memory is allocated using **VirtualAlloc** to hold the decrypted payload.



The IcedID “Gziploader” payload is decoded and placed in memory and then executed. GZiploader fingerprints the machine and sends a beacon to the command and control server with information about the infected host. The information is smuggled through the cookies header via an HTTP GET request.



The C2 is located at *yourgroceries[.]top*. The C2 can respond with a further stage to be dropped and executed. The C2 did not respond with a payload during our analysis.



Conversation Hijacking as a Phishing Technique

The technique of hijacking an already existing conversation over email to spread malware is something threat actors have been using for a while. Normally email messages are stolen during an infection and used in future attacks to make the phishing email appear more legitimate. In the last six months, threat actors have evolved the technique further to make it even more convincing. Instead of sending the stolen conversation to the victim with a "spoofed" email address, threat actors are now using the email address of the victim that they stole the original email from to make the phishing email even more convincing.

Kevin Beaumont reported on this conversation hijacking technique back in November 2021 being used to distribute Qakbot. Through the investigation, he confirmed that the Microsoft Exchange servers where the emails originated from had evidence of being exploited by ProxyShell.

New Campaign Discovered in March 2022

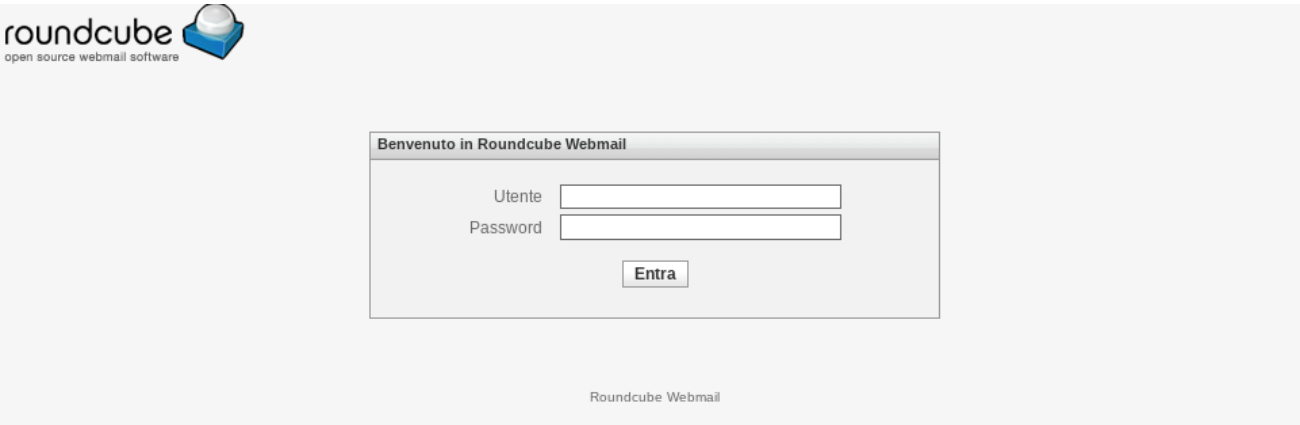
In the current mid-March campaign, we have discovered reuse of the same stolen conversation now being sent from the email address that received the latest email. Back in January when this conversation was also used, the "FROM" address was "webmaster@[REDACTED].com" with the name of the recipient of the last email in the conversation. By using this approach, the email appears more legitimate and is transported through the normal channels which can also include security products.

The majority of the originating Exchange servers we have observed appear to also be unpatched and publicly exposed, making the ProxyShell vector a good theory. While the majority of the Exchange servers used to send the phishing emails can be accessed by anyone over the Internet, we have also seen a phishing email sent internally on what appears to be an "internal" Exchange server.

The code snippet below shows a small part of the email header. The IP address of the Exchange server is a local IP address (172.29.0.12) with a top-level domain name of "local". We can also see a header added by Exchange marking it as an internal email. The exchange server also has added a header of the original client (172.29.5.131 which also is a local IP address) that connected to the Exchange server over MAPI.

```
Received: from ExchSrv01.[REDACTED].local (172.29.0.12) by
 ExchSrv01.[REDACTED].local (172.29.0.12) with Microsoft SMTP Server
 (version=TLS1_2, cipher=TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384) id 15.2.464.5
 via Mailbox Transport; Thu, 10 Mar 2022 14:34:29 +0100
Received: from ExchSrv01.[REDACTED].local (172.29.0.12) by
 ExchSrv01.[REDACTED].local (172.29.0.12) with Microsoft SMTP Server
 (version=TLS1_2, cipher=TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384) id 15.2.464.5;
 Thu, 10 Mar 2022 14:34:29 +0100
Received: from ExchSrv01.[REDACTED].local ([fe80::b148:8e7:61f8:61b4]) by
 ExchSrv01.[REDACTED].local ([fe80::b148:8e7:61f8:61b4%6]) with mapi id
 15.02.0464.005; Thu, 10 Mar 2022 14:34:29 +0100
…
X-MS-Exchange-Organization-AuthAs: Internal
X-MS-Exchange-Organization-AuthMechanism: 04
X-MS-Exchange-Organization-AuthSource: ExchSrv01.[REDACTED].local
X-MS-Has-Attach: yes
X-MS-Exchange-Organization-SCL: -1
X-MS-Exchange-Organization-RecordReviewCfmType: 0
x-ms-exchange-organization-originalclientipaddress: 172.29.5.131
x-ms-exchange-organization-originalserveripaddress: fe80::b148:8e7:61f8:61b4%6
```

We didn't manage to find a corresponding public IP address for this Exchange server and it is not known to us how it was accessed by the threat actor. The only thing we managed to find was a roundcube webmail instance. The login page is shown in the screenshot below.



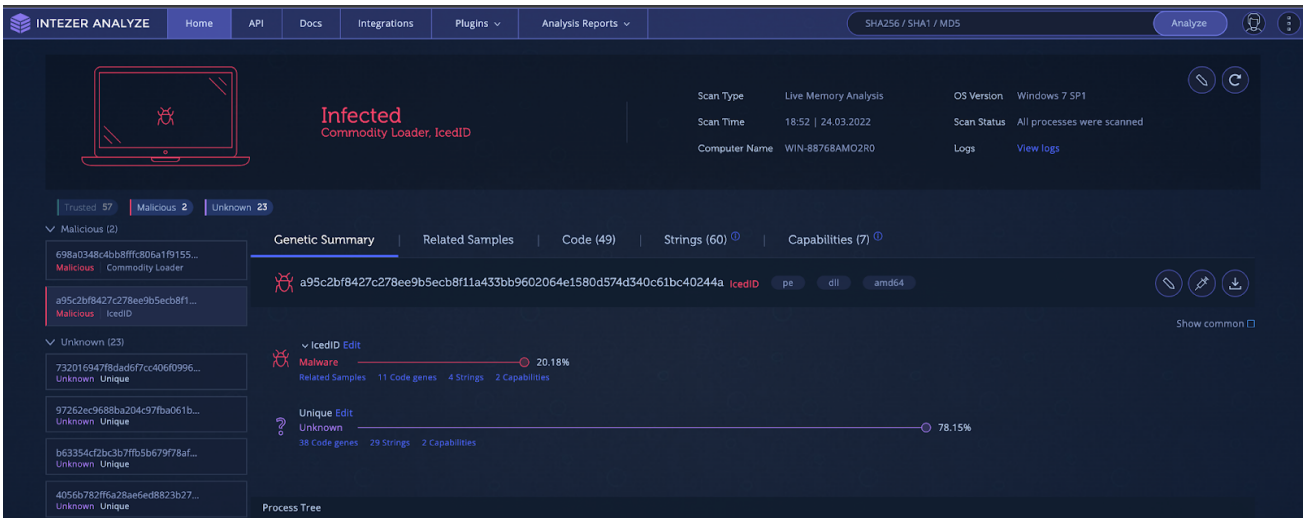
One of the headers in the snippet above reported that the client connected to the server via MAPI. MAPI is a protocol used (for example, by Outlook) to access the mailbox on an Exchange server. This suggests that the threat actor used an Exchange client instead of using SMTP to send the email. We have also seen the header "X-Mailer: Microsoft Outlook 16.0" in multiple phishing emails. In other phishing emails a "X-Originating-IP" header can be found. This is a header added by the Exchange server when the web interface is used. The IP address in the header is that of the client that connected to the server. We have observed both hosting providers and non-commercial IP addresses for the client IP.

Attribution

In June 2021, Proofpoint released a report on different access brokers that facilitates access for ransomware groups. Of the different threat actors, according to Proofpoint, two of them (TA577 and TA551) used IcedID as their malware. The techniques used by TA551 include conversation hijacking and password protected zip files. The group is also known to use regsvr32.exe for signed binary proxy execution for malicious DLLs.

Summary

The use of conversation hijacking is a powerful social engineering technique that can increase the rate of a successful phishing attempt. The payload has been moved away from office documents to the use of ISO files, employing the use of commodity packers and multiple stages to hide activity. It is important to be able to detect malicious files in memory to detect this type of attack. We recommend you use an endpoint scanner.

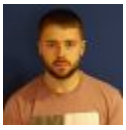


IoCs

```
ISO File:
3542d5179100a7644e0a747139d775dbc8d914245292209bc9038ad2413b3213

Loader DLL:
698a0348c4bb8fffc806a1f915592b20193229568647807e88a39d2ab81cb4c2

LNK File:
a17e32b43f96c8db69c979865a8732f3784c7c42714197091866473bcfac8250

IcedID GZiploader Network:
yourgroceries[.]top
```

Joakim Kennedy

Dr. Joakim Kennedy is a Security Researcher analyzing malware and tracking threat actors on a daily basis. For the last few years, Joakim has been researching malware written in Go. To make the analysis easier he has written the Go Reverse Engineering Toolkit (github.com/goretk), an open-source toolkit for analysis of Go binaries.



Ryan Robinson

Ryan is a security researcher analyzing malware and scripts. Formerly, he was a researcher on Anomali's Threat Research Team.