November 30th, 2020

IcedID Bulletin

EXECUTIVE SUMMARY

IcedID stealer (Also known as BokBot) was first discovered at the end of 2017, believed to be a resurgence of the NeverQuest banking Trojan. It is a modular banking trojan that uses man-in-the-browser (MitB) attacks to steal banking credentials, payment card information and other financial data.

The stealer possesses relatively sophisticated functionality and capabilities such as web injects, a large remote access trojan (RAT) arsenal and a VNC module for remote control. Additionally, the use of steganography to hide configuration data along with anti-VM detection and anti-debugging techniques complicate detection and analysis.

IcedID's typical range of targets includes the customers of banks and telecommunications organisations worldwide leading to impacts including brand abuse, funds theft and customer data breaches.

Cyberint have recently observed an ongoing campaign targeting users in the APAC region with an apparent focus on the Philippines and Japan.

The IcedID stealer is traditionally delivered by a malspam lure, with Microsoft Word attachments weaponized with malicious Macros, based on Emotet.

While the majority of recently detected lure documents were written in English and targeted a wide range of users, localized campaigns have also been reported. One such recent example targeted users located in Japan with lure documents in Japanese, likely indicating that the threat actor behind this threat is relatively sophisticated and may focus on specific geographies as potential targets, adjusting their arsenal accordingly.

Whilst it is not possible to attribute IcedID to a specific group, past indications suggest a potential link to the following threat actors:

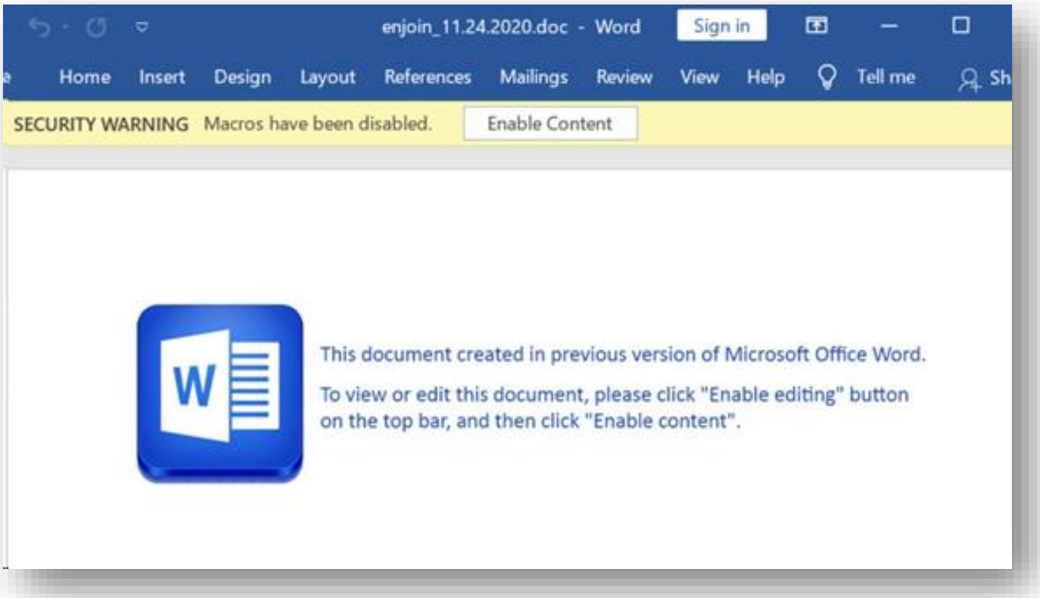
- Lunar Spider

- TA2101

DELIVERY

The email contains an attached ZIP folder protected by a password provided within the email body.

At the next stage, once the user extracts the document file from the ZIP folder, they will be requested to 'Enable Content' (Figure 1) within Microsoft Word, leading to malicious Macro code being executed whilst decoy content (Figure 2) is displayed.

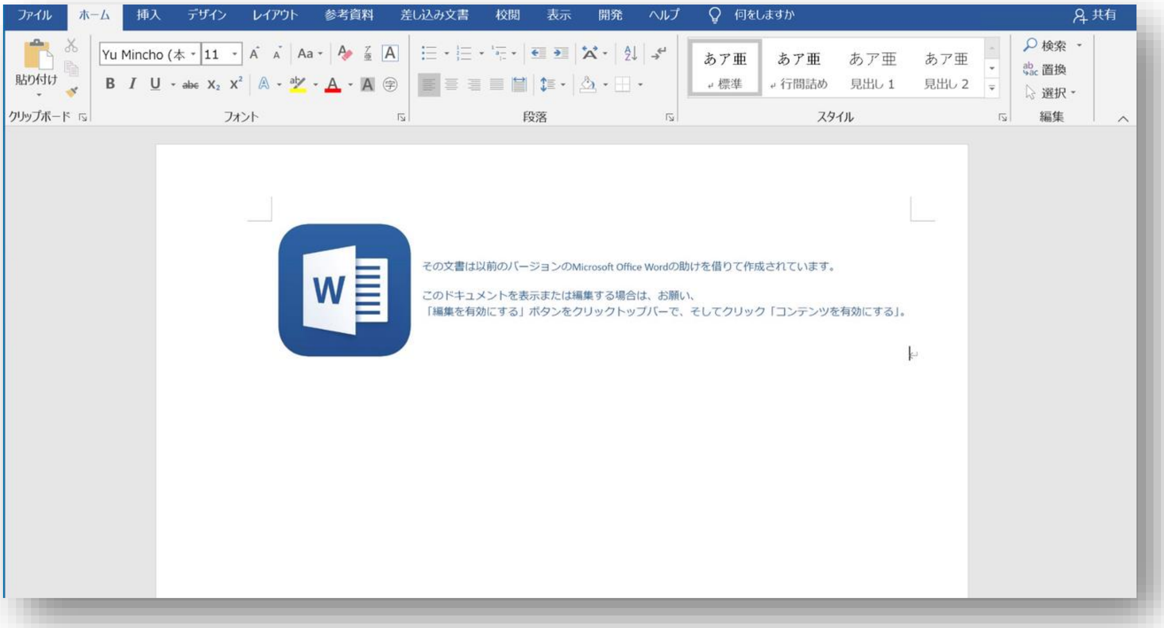


SECURITY WARNING Macros have been disabled.

This document created in previous version of Microsoft Office Word.

To view or edit this document, please click "Enable editing" button on the top bar, and then click "Enable content".

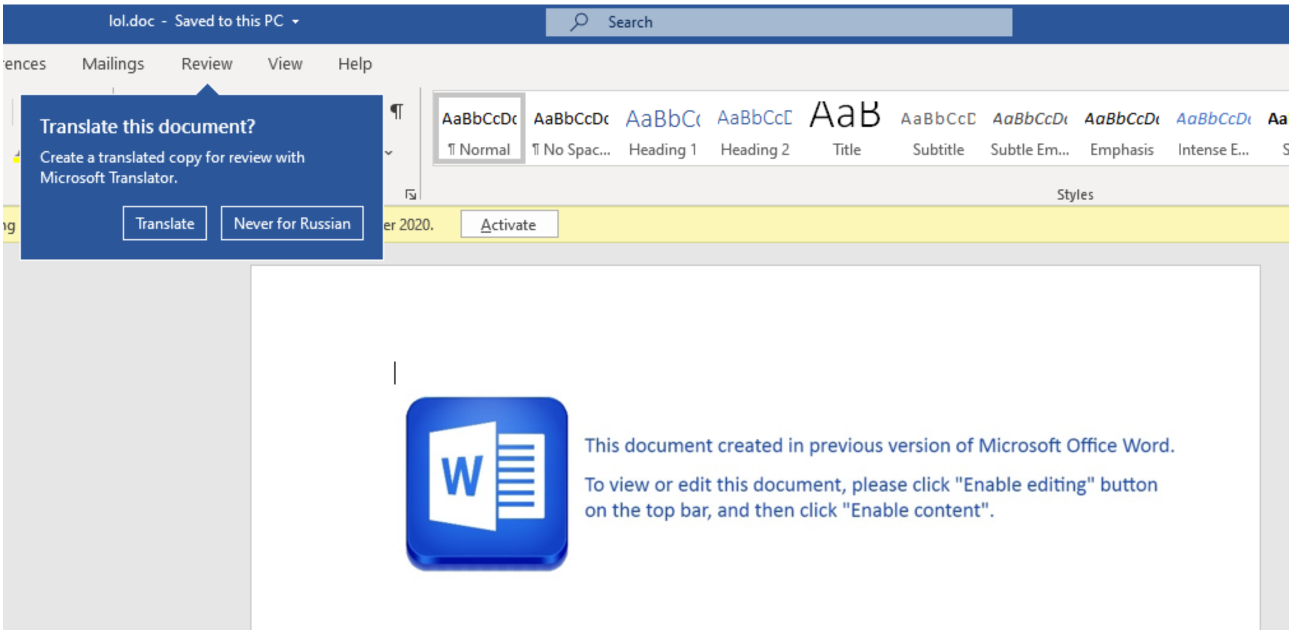
Figure 1 - Prompt to relax security controls



その文書は以前のバージョンのMicrosoft Office Wordの助けを借りて作成されています。

このドキュメントを表示または編集する場合は、お願い、
「編集を有効にする」ボタンをクリックトップバーで、そしてクリック「コンテンツを有効にする」。

Figure 2 - Decoy document content

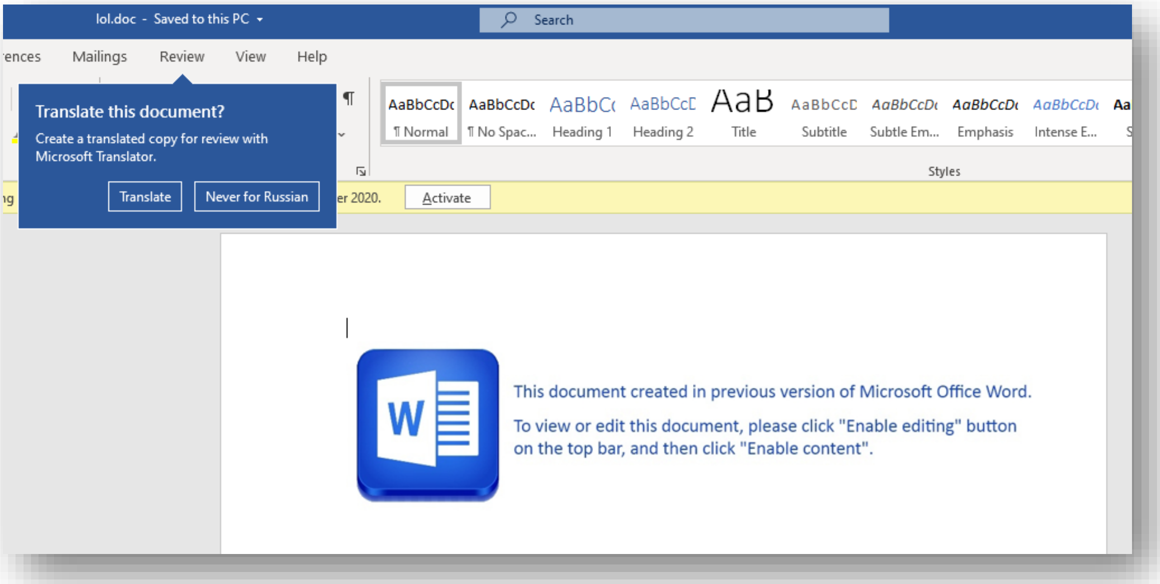


Translate this document?

Create a translated copy for review with Microsoft Translator.

This document created in previous version of Microsoft Office Word.

To view or edit this document, please click "Enable editing" button on the top bar, and then click "Enable content".



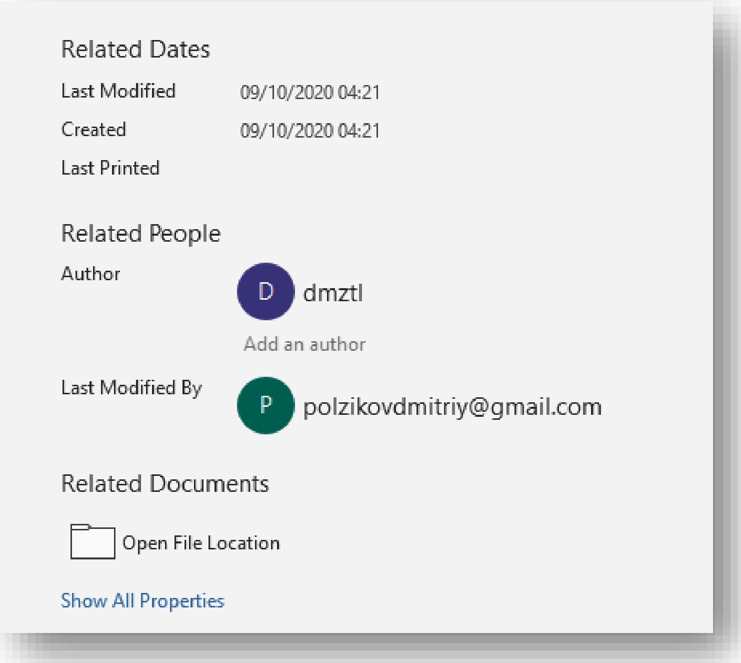
Translate this document?

Create a translated copy for review with Microsoft Translator.

This document created in previous version of Microsoft Office Word.

To view or edit this document, please click "Enable editing" button on the top bar, and then click "Enable content".

Figure 3 - Document metadata detected as Russian



Related Dates

Last Modified 09/10/2020 04:21

Created 09/10/2020 04:21

Last Printed

Related People

Author D dmztl

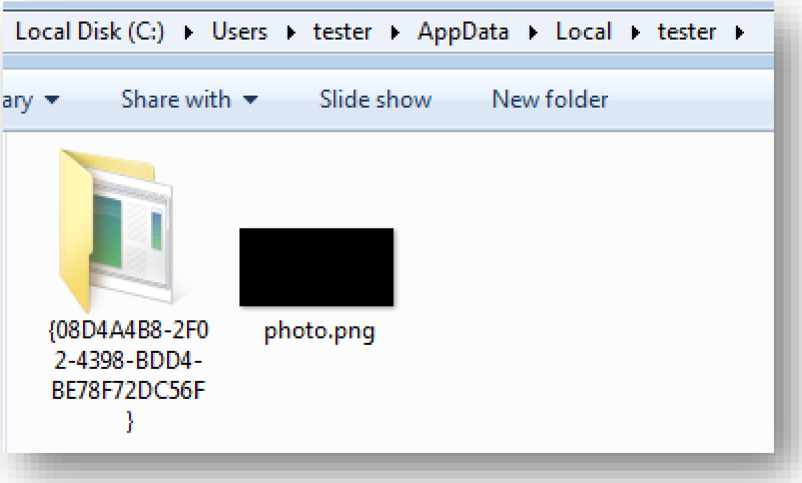
Add an author

Last Modified By P polzikovdmitriy@gmail.com

Related Documents

Figure 4 - Threat actor email address, used for the file creation

Once executed, the macro will write a variety of files to the drive, used for the download and decryption of the latest IcedID trojan, including an up-to-date configuration file containing a list of target bank and telecommunication organizations. In some cases, this was observed as a DLL file, where in others it was a steganographically obfuscated PNG file (Figure 3).



Local Disk (C:) ▸ Users ▸ tester ▸ AppData ▸ Local ▸ tester ▸

{08D4A4B8-2F02-4398-BDD4-BE78F72DC56F}

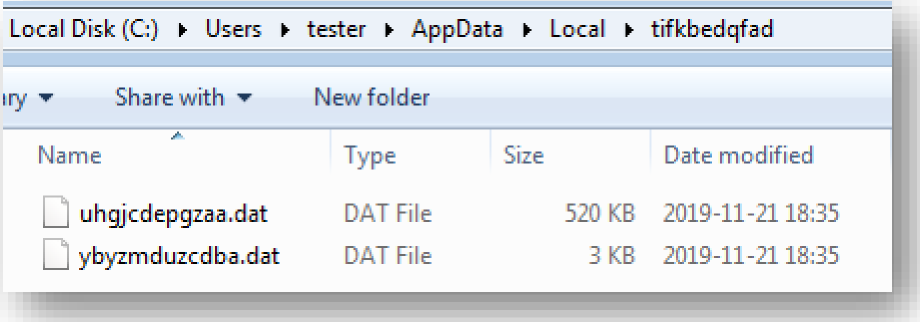
[redacted]

photo.png

Figure 5 - PNG Configuration Payload

Although surfaced in 2017, many iterations of this trojan have been well-investigated by numerous security researchers globally, but for the past year (circa January 2020), several new techniques were added in order to detect and evade sandboxes, and to generally hide the execution process taking place.

It was also noticed that the malware creates a new folder with a random name, where it saves a downloaded configuration in encrypted form (Figure 4).

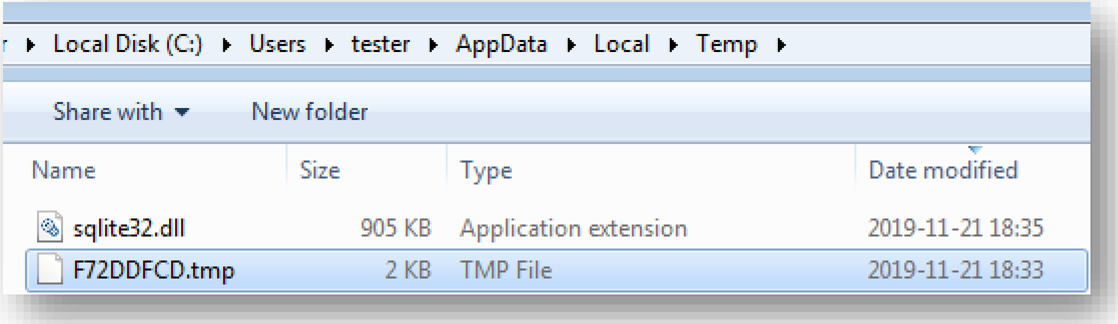


Local Disk (C:) ▸ Users ▸ tester ▸ AppData ▸ Local ▸ tifkbedqfad

Name	Type	Size	Date modified
uhgjcdepgzaa.dat	DAT File	520 KB	2019-11-21 18:35
ybyzmduzcdba.dat	DAT File	3 KB	2019-11-21 18:35

Figure 6 - Download directory

Inside the %TEMP% folder, it drops some non-malicious helper elements: *sqlite32.dll* (that will be used for reading SQLite browser databases found in web browsers), and a certificate that will be used for intercepting traffic (Figure 5).


▸ Local Disk (C:) ▸ Users ▸ tester ▸ AppData ▸ Local ▸ Temp ▸
Share with ▾
New folder

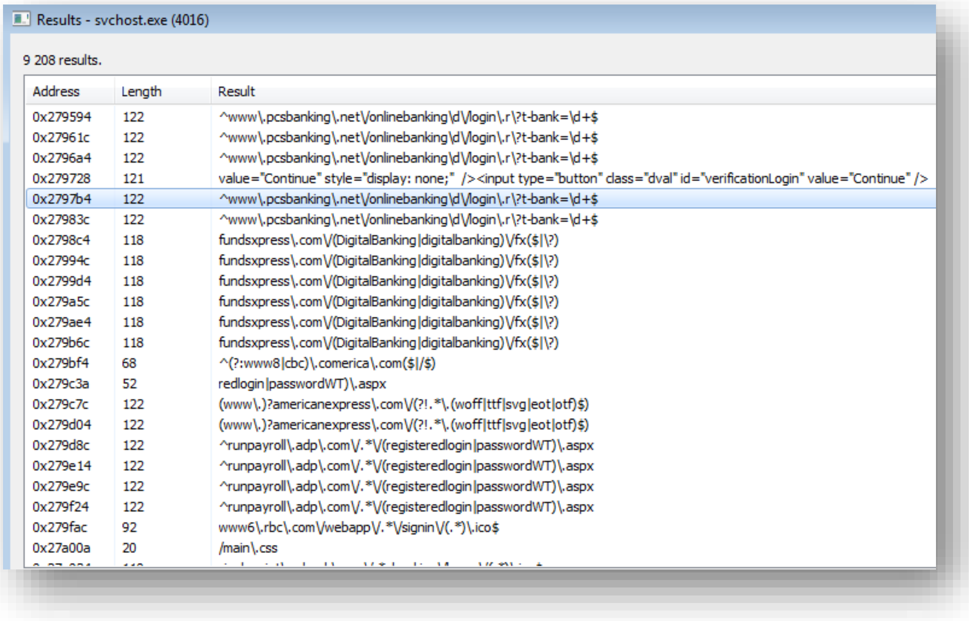
Name	Size	Type	Date modified
sqlite32.dll	905 KB	Application extension	2019-11-21 18:35
F72DDFCD.tmp	2 KB	TMP File	2019-11-21 18:33

Figure 7 - Temp directory

INFECTION

Once infected, the IcedID trojan, known as a banking Trojan, steals data related to banking transactions by injecting implants into browsers, API hooks and a 'Man-in-the-Browser' (MitB)[1] attack to manipulate visited webpages.

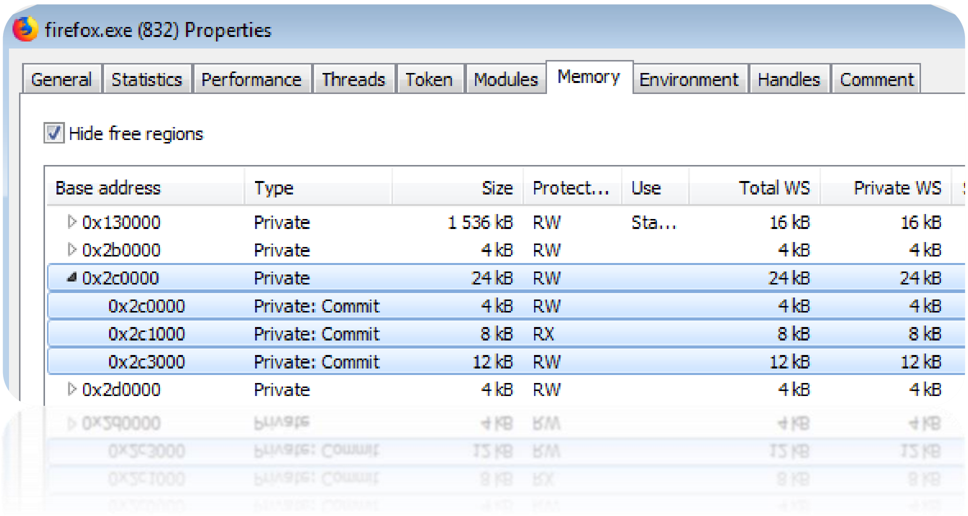
As observed (Figure 6) in the memory of an infected host, the svchost process contains strings that reveal the configuration of these 'web-injects', that being modular HTML and JavaScript code elements that are injected into the webpage of a targeted brand to steal data.



```
Results - svchost.exe (4016)

9 208 results.

Address    Length  Result
0x279594   122     ^www\.pcsbanking\.net\/onlinebanking\d\/login\.r\?t-bank=\d+$
0x27961c   122     ^www\.pcsbanking\.net\/onlinebanking\d\/login\.r\?t-bank=\d+$
0x2796a4   122     ^www\.pcsbanking\.net\/onlinebanking\d\/login\.r\?t-bank=\d+$
0x279728   121     value="Continue" style="display: none;"  /><input type="button" class="dval" id="verificationLogin" value="Continue" />
0x2797b4   122     ^www\.pcsbanking\.net\/onlinebanking\d\/login\.r\?t-bank=\d+$
0x27983c   122     ^www\.pcsbanking\.net\/onlinebanking\d\/login\.r\?t-bank=\d+$
0x2798c4   118     fundsxpress\.com\/(DigitalBanking|digitalbanking)\/fx($|\?)
0x27994c   118     fundsxpress\.com\/(DigitalBanking|digitalbanking)\/fx($|\?)
0x2799d4   118     fundsxpress\.com\/(DigitalBanking|digitalbanking)\/fx($|\?)
0x279a5c   118     fundsxpress\.com\/(DigitalBanking|digitalbanking)\/fx($|\?)
0x279ae4   118     fundsxpress\.com\/(DigitalBanking|digitalbanking)\/fx($|\?)
0x279b6c   118     fundsxpress\.com\/(DigitalBanking|digitalbanking)\/fx($|\?)
0x279bf4   68      ^(?:www8|cbc)\.comerica\.com($|/$)
0x279c3a   52      redlogin|passwordWT)\.aspx
0x279c7c   122     (www\.)?americanexpress\.com\/(?!.*\.(woff|ttf|svg|eot|otf)$)
0x279d04   122     (www\.)?americanexpress\.com\/(?!.*\.(woff|ttf|svg|eot|otf)$)
0x279d8c   122     ^runpayroll\.adp\.com\/.*\/(registeredlogin|passwordWT)\.aspx
0x279e14   122     ^runpayroll\.adp\.com\/.*\/(registeredlogin|passwordWT)\.aspx
0x279e9c   122     ^runpayroll\.adp\.com\/.*\/(registeredlogin|passwordWT)\.aspx
0x279f24   122     ^runpayroll\.adp\.com\/.*\/(registeredlogin|passwordWT)\.aspx
0x279fac   92      www6\.rbc\.com\/webapp\/.*\/signin\/(.*)\.ico$
0x27a00a   20      /main\.css
```

Figure 8 - Web-inject strings found in memory

The core bot that runs inside the memory of the `svchost` process observes other processes running on the system and injects implants into browsers, for example as seen in Mozilla Firefox (Figure 9).

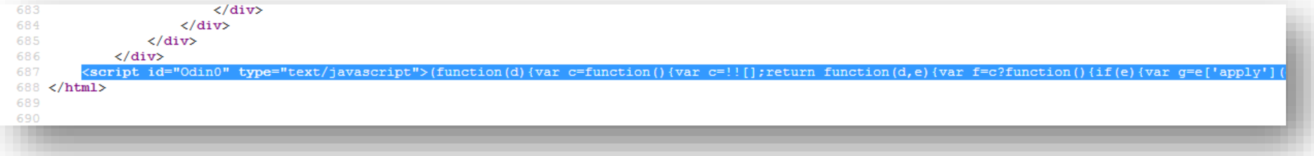


☑ Hide free regions

Base address	Type	Size	Protect...	Use	Total WS	Private WS
▷ 0x130000	Private	1 536 kB	RW	Sta...	16 kB	16 kB
▷ 0x2b0000	Private	4 kB	RW		4 kB	4 kB
◢ 0x2c0000	Private	24 kB	RW		24 kB	24 kB
0x2c0000	Private: Commit	4 kB	RW		4 kB	4 kB
0x2c1000	Private: Commit	8 kB	RX		8 kB	8 kB
0x2c3000	Private: Commit	12 kB	RW		12 kB	12 kB
▷ 0x2d0000	Private	4 kB	RW		4 kB	4 kB

Figure 9 - Mozilla Firefox Web-inject

The IcedID module running inside the browser's memory is responsible for applying the web-injects and installing malicious JavaScript into targeted webpages causing them to be executed on the client side (Figure 8).



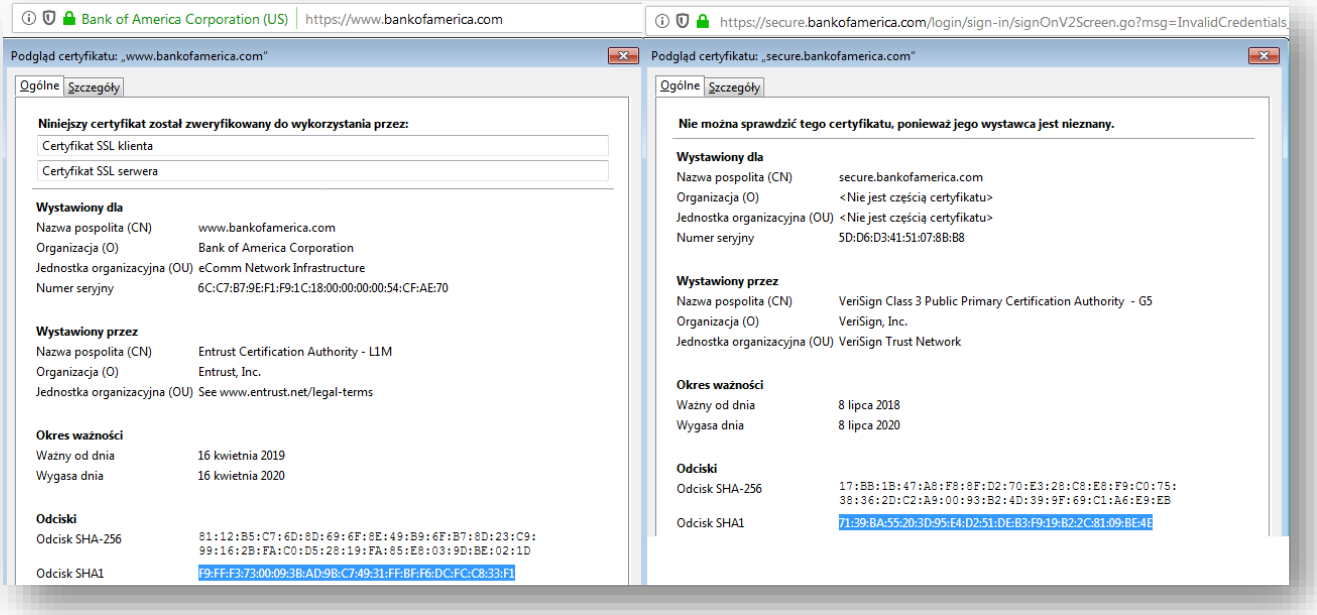
```
                    </div>
                </div>
            </div>
        </div>
    <script id="Odin0" type="text/javascript">(function(d){var c=function(){var c=!![];return function(d,e){var f=c?function(){if(e){var g=e['apply'](
</html>


```

Figure 10 - Injected code snippet executed on the client side (Example code available via GitHub[2])

C2

The hooked scripts, loaded from modified browser `DLLs`, communicate with the main bot process residing inside the *`svchost`* process. The main bot coordinates the work of all the injected components and exfiltrates stolen data to the C2 server.

In order to properly hide and encrypt its communication processes, all C2 communications are made over HTTPS using the trojan's own certificate (Figure 11).



Bank of America Corporation (US) https://www.bankofamerica.com

Podgląd certyfikatu: „www.bankofamerica.com"

Niniejszy certyfikat został zweryfikowany do wykorzystania przez:

Certyfikat SSL klienta

Certyfikat SSL serwera

Wystawiony dla

Nazwa pospolita (CN)	www.bankofamerica.com
Organizacja (O)	Bank of America Corporation
Jednostka organizacyjna (OU)	eComm Network Infrastructure
Numer seryjny	6C:C7:B7:9E:F1:F9:1C:18:00:00:00:00:54:CF:AE:70

Wystawiony przez

Nazwa pospolita (CN)	Entrust Certification Authority - L1M
Organizacja (O)	Entrust, Inc.
Jednostka organizacyjna (OU)	See www.entrust.net/legal-terms

Okres ważności

Ważny od dnia	16 kwietnia 2019
Wygasa dnia	16 kwietnia 2020

Odciski

Odcisk SHA-256	81:12:B5:C7:6D:8D:69:6F:8E:49:B9:6F:B7:8D:23:C9: 99:16:2B:FA:C0:D5:28:19:FA:85:E8:03:9D:BE:02:1D
Odcisk SHA1	F9:FF:F3:73:00:09:3B:AD:9B:C7:49:31:FF:BF:F6:DC:FC:C8:33:F1

https://secure.bankofamerica.com/login/sign-in/signOnV2Screen.go?msg=InvalidCredentials

Podgląd certyfikatu: „secure.bankofamerica.com"

Nie można sprawdzić tego certyfikatu, ponieważ jego wystawca jest nieznany.

Wystawiony dla

Nazwa pospolita (CN)	secure.bankofamerica.com
Organizacja (O)	<Nie jest częścią certyfikatu>
Jednostka organizacyjna (OU)	<Nie jest częścią certyfikatu>
Numer seryjny	5D:D6:D3:41:51:07:8B:B8

Wystawiony przez

Nazwa pospolita (CN)	VeriSign Class 3 Public Primary Certification Authority - G5
Organizacja (O)	VeriSign, Inc.
Jednostka organizacyjna (OU)	VeriSign Trust Network

Okres ważności

Ważny od dnia	8 lipca 2018
Wygasa dnia	8 lipca 2020

Odciski

Odcisk SHA-256	17:BB:1B:47:A8:F8:8F:D2:70:E3:28:C8:E8:F9:C0:75: 38:36:2D:C2:A9:00:93:B2:4D:39:9F:69:C1:A6:E9:EB
Odcisk SHA1	71:39:BA:55:20:3D:95:E4:D2:51:DE:B3:F9:19:B2:2C:81:09:BE:4E

Figure 11 - Valid Bank of America certificate (left) vs. IcedID (right) - Note the hash mismatch

[1] https://en.wikipedia.org/wiki/Man-in-the-browser

[2] https://gist.github.com/malwarezone/830f4a0e4506d35e376a288b20d21433#file-inject-js

Recommendations

- Notify customer care of the ongoing threat in case of funds loss.
- Cyberint recommends that customers educate their end-users and always check for unusual browser behaviors that may lead to account compromise or funds theft.
- Phishing awareness to the end-users is advised.
- Usage of a modern, updated AV solution is advised.
- MFA should be enabled on all of the end-user accounts.

INDICATORS OF COMPROMISE

TARGETED BRANDS/ORGANIZATIONS

Based on strings extracted from IcedID samples, the following brands and/or organizations appear to be targeted:

- Amazon.com
- American Express
- AT&T
- Bank Of America
- Capital One
- Chase
- CIBC
- Comerica
- Dell
- Discover
- Dollar Bank
- eBay
- Erie Bank
- E-Trade
- Frost Bank
- Halifax UK
- Hancock Bank
- Huntington Bank
- J.P. Morgan
- Lloyds Bank
- M&T bank

- Centennial Bank
- PNC
- RBC
- Charles Schwab
- SunTrust Bank
- Synovus
- T-Mobile
- Union Bank
- USAA
- US Bank
- Verizon Wireless
- Wells Fargo

ICEDID SAMPLES

The following SHA256 hashes relate to recently observed IcedID malware samples:

- 00ec5cc40b91832adc257b43cb28f2fe0734c6e1761ae5020bd8178116ed005c
- 02c2cace0eab2cb902cf567be3524616db1747abd79c3417d3762452c604ab85
- 08cc79fac123eefee7e05e3568a0aa6d219e43d22b0679ea5d7a3ffaf4337403
- 08d1f171b424a35c7aeebb55da2077078f62fae847616a4f8c80f3e3e11d6573
- 10164d00c17bacb88eca79a8a836176ac49bfb7547ed90efcb86d19cdfda9dcb
- 12b73194a373f12d89a83152bd56ee02054dd20030cb6b421b7e79e70e1d2484
- 17f2d25fcba0ad909c0561179407b4bb37917b643b2c181dcdcb4c3cec743a5c
- 213347251fc9f4b6812547ecfef2b3783789067ccffee1521eb88c36003a742e
- 36d5d2317b7172e45229c24b2870bd827a8bdc7204fe2cd70aedb74c81e75126
- 3df7246090c8b2a9c9d19d68ca4bd2908247494a8badea39c00e3f20d60dfcae
- 3eace4aacf5dc5dc624ab72cf84b7c0f476ee0ff0de267d0976e25d2eee9f5d9
- 3f1b388938f1e6c6920e54639b8a3dafa9e381f3ef45e855123941e83bad64c7
- 3f8bc3cde5654bd8ac467a2efd1f926808c5915a6fd3e3f1d32edd13eaf3f1b1
- 4e7b3116a6589afe645b3e42e0ee9d0fa9c41c7847bca52e1be85ccd1058556b
- 550e7c5e79a0455d26f02e84921b7c40645d0b361c1e09e1b00bc79a930b2e85
- 56de520fa4445ccabe60373b039299f5709f291ff594482c92670d1eb8b911f6
- 6297e0fa6229c7f329f66227656bbf99d1329aaa48341c2f750c78f1937ac952
- 65ca5c2ea9b9eb4d10ab9d91e3928bdff5f27883a5a4c85a4e0871b56ab3533f
- 6a6243c111cbf9a94177835ab02a8378497ed18b5ba1d6fdceb03e9410e08cec
- 6bae8f2c4c1b730825cc5e9ce7bae35039eb08833b7310bf4f444d2524b1601f
- 6df240658329d6c21a7d6669c47ad824cb0d8af76cca197da2d919f27fc4b70e
- 6eb53a11d07dd708ecb63b036145e7e942a61eb693cc3353c612569121b4a110

- 732a12f4a7b85176abfc17c142e83761d7a957672852af0d9069a9bc47defeb1
- 75509601134e810e7ae3dc36e8b9abff1025c0a0dada3b21ead7e24fd5f3ce2c
- 79957427faa2eed376f597aba9eb43fe9789e715833026fefd50458c73ee32b4
- 7a1a59257242c047bb2864abb448e00cfc8b2d281faab4bbfd3ce790c9c27400
- 7a371fcda4e07d7d7e516eed24c84908a601041bc00bb8736680d0b2349e3dec
- 7d6cdbaac836d0c95876c7c669687c933d3097477680864d9d4d6b7fb0c08345
- 7df70a77a6d20050c3d38bc30a2ccfeef4523f811c128717dbfd82325b50bbc8
- 7f19267b62de5efe0bbcd716c9f481e108fb60f4d35435595ae27489d08f7e0d
- 7fde0ff1061d3d15fe584f6ea186e1a23b9ce07123ff9dd70f71fcb51c099369
- 8be1e875a92483a1301d9144b5cd8897951ccb3ca811c99f10e51fff67552166
- 8c7dc92c6019d80364cda2d6ce19b157ac77b013731415d825b1a30f93c6d56d
- 9bb46cd5d1047a3694b3a3862c7ec16d0c3e7838d91c1361760f92958897be5c
- a4f88c40f615a527c16159d41c2798ff452c17a394e96d3b028516c46f88462f
- a7d8b3ab991c3be2e0f60fd748be9b55072f65b4cc0a36dc0d3c470ac3ea33b2
- b559a7560009ca33ad205d32122cb67538dd392ea4a4f5feffa521288810e5bd
- b8a1f0962411b5e5b5bc5e2c77b56c5a2f0fdfc5fe3c3a5857466fbfe9ac66bd
- b9d50f2ddfaa200c7c4695a9eb59c81347b52d53383534997c8b318b75be07d1
- ba92631f803bed252ce1839612315ab40653b2eff3e5f12edc38e4a66e004ccb
- baf2c1ade873167029a7ebc83ba56dca256ca91bd527a451ddde2efa3e3b6ddb
- c6019a1c6d66bc6aae0b6c1502ff241dd9cd00b60ef5e45b2dbd38571f40fb1f
- c6ea88ec4f01251649010e4a364374c90fc9f5bb6c22f1368ee5f222ea5e9b60
- c7bb632d52a485b9a2be160b2f8fa29abb3cd840ef0e7747f5d509846dcbf38b
- ca6738bd50f5eb9a4559f58d5c5ee6e8045a30fd306c110d760dcc325c9aacff
- cab24ced596b142b9bb38e691addea16c72b40d4b5f96865a25052ff11aeb6e0
- cdba1a0f75ecbeda42243f44cd8ac9b9fcd90e9213d8b4f8280e90b956635030

- ce36a13c5f837b9a1658ea5d77f1114b16ce4dada582e47d646321e5dd7cb0c1
- d35d93cbf992171905ec9c00f6c821850d3d1335c591df86f2dd3966d25f8ba0
- d5baabfe5ca28dd041bea2504807dbcdb1ff91b5c8f7e74c16e56f5b810ea3b5
- d9c7e8813b3d6c361e655a90c76b713bc90865819394df52e38e6012e48836b8
- e77c51ee76cde36adf1ad4a2461a3d29e6964aa13fde870c4e6fad041cebbec8
- eb1c15124298fa388784f270ceb0e6176dac3e65ad81f2e6951b1c4ce9381ea3
- f540a652469981b7a0ba4337c228712888e1d9cf75a00ce17c3fd3775c9b2781
- f6cba12a315620b39f172e496ade5dd6048cc09a6e454f9209284c73ffd055e2
- f8ed31cb2708b5230a3ce326153dbe0a1821161ef5e8b4d9e4df1edcd536db3e
- fc9565534d447bb7d5498aec1dcf1e0b933a7a717c159690529ba3b5ad7c9922

COMMAND & CONTROL INFRASTRUCTURE

The following command and control (C2) IP addresses have recently been observed as IcedID infrastructure:

- 149.154.64.179
- 178.250.156.74
- 178.250.157.144
- 185.219.43.85
- 185.98.87.6
- 193.109.79.219
- 193.201.126.18
- 194.61.2.224
- 45.12.4.206
- 45.128.206.80
- 45.129.237.168
- 45.150.64.102
- 45.150.64.57
- 45.8.124.36
- 45.89.67.169
- 5.253.61.235
- 62.109.14.179
- 80.85.158.53
- 83.166.242.27
- 93.189.41.223

REFERENCES

[1] https://blog.malwarebytes.com/threat-analysis/2019/12/new-version-of-icedid-trojan-uses-steganographic-payloads/ - Screenshots