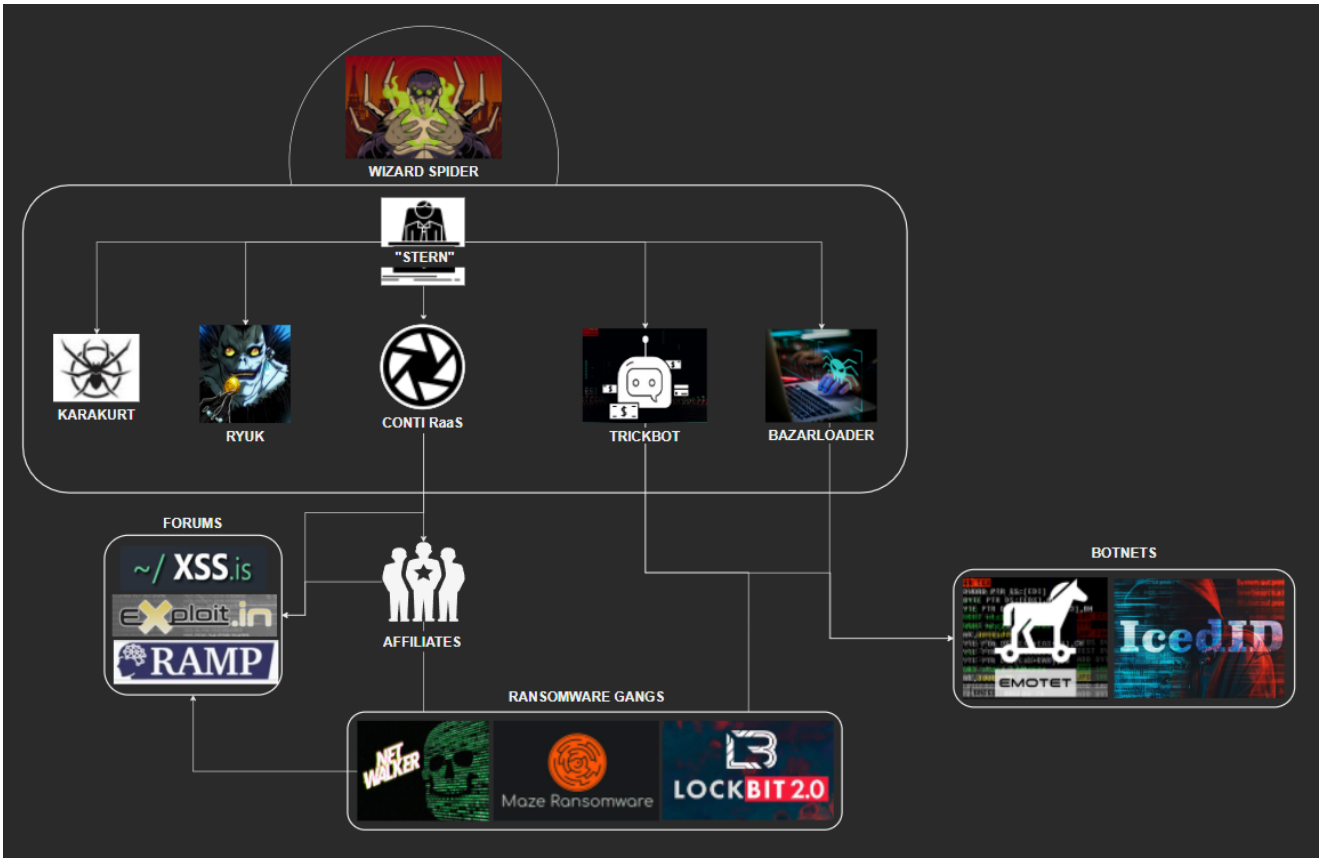
Lessons from the Conti Leaks

blog.bushidotoken.net/2022/04/lessons-from-conti-leaks.html

BushidoToken



If you wanted to learn how an organized cybercriminal operation worked, look no further than the threat group known as Conti. The recent leaks of the group's chat logs have uncovered an unprecedented wealth of information and insights into how these veteran cybercriminals organize themselves.

Cyber Threat Intelligence (CTI) vendors and independent researchers have spent weeks poring over the Conti leaked chat logs and have uncovered dozens of very significant findings.

In this blog, I didn't want to duplicate what is already known (too much). I wanted to share some of the findings that I thought were the most interesting to me. To rapidly get up to speed on the Conti Leaks, I highly recommend other researchers to read the work in the following blogs:

I will also recommend to read what other researchers have tweeted about what they found in the Conti Leaks:

- Observable Tactics, Techniques, and Procedures (TTPs) https://twitter.com/TheDFIRReport/status/1498642505646149634
- Cobalt Strike commands from RocketChat logs https://twitter.com/c3rb3ru5d3d53c/status/1499130574321197058
- All CVEs discussed in the Conti chat server https://twitter.com/c3rb3ru5d3d53c/status/1499570311460753408
- Proof Conti members are active on Twitter https://twitter.com/VK_Intel/status/1498761290709409792
- Conti member interviewed by local police https://twitter.com/VK_Intel/status/1498400616615395328
- Conti members acquire CarbonBlack and Sophos https://twitter.com/albertzsigovits/status/1498237945685422087
- Conti's Exploit[.]in account https://twitter.com/pancak3lullz/status/1499108972258906123
- Conti's Bitcoin wallets https://twitter.com/pancak3lullz/status/1498347648637624326

With those out of the way, we can get to the meat of this blog. I cannot emphasize enough that these leaks are **gargantuan** and span years of the group's operations. I seem to find something new every time I take another look at them but now have enough for a blog of my own.

Reconnaissance

One major discovery in the Conti leaks is that multiple vendors have covered is the existence of an "OSINT Team" who gathers details on Conti's targets. This team uses multiple techniques, as well as commercial tools, to find every piece of information about a target that will support the end goal of domain-wide Conti ransomware deployment. This OSINT Team also may engage with the targets (HUMINT), posing as marketing or sales people, gathering details and information about managers, executives, and how the company operates for exploitation later.

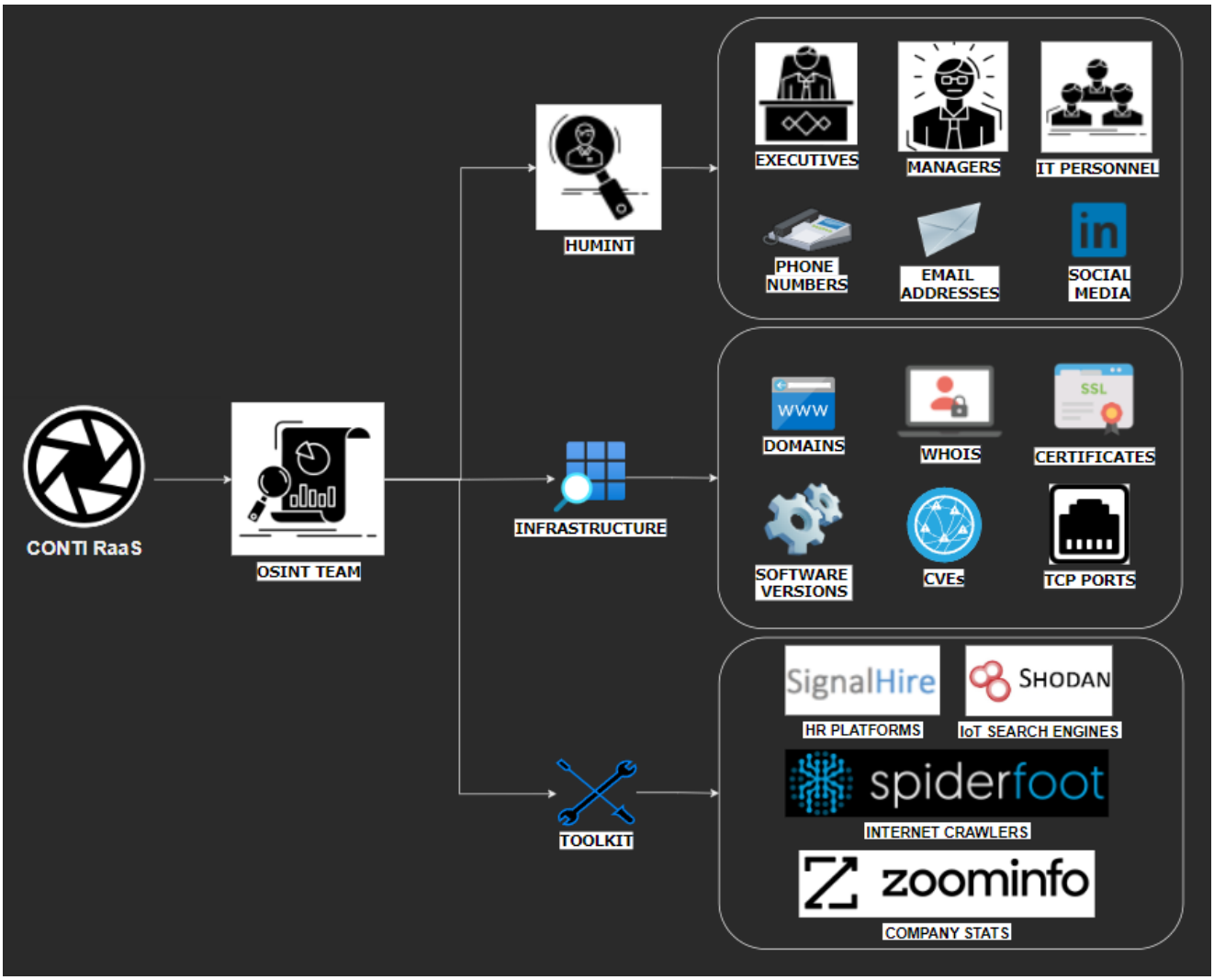


Fig. 1 - Overview of the Conti OSINT Team

Phishing

It is well-documented that Conti ransomware attacks often begin via a phishing email. The group has been launching widespread and targeted phishing campaigns for years using a multitude of tactics. The Conti Leaks also shared some insights into how these phishing campaigns are orchestrated.

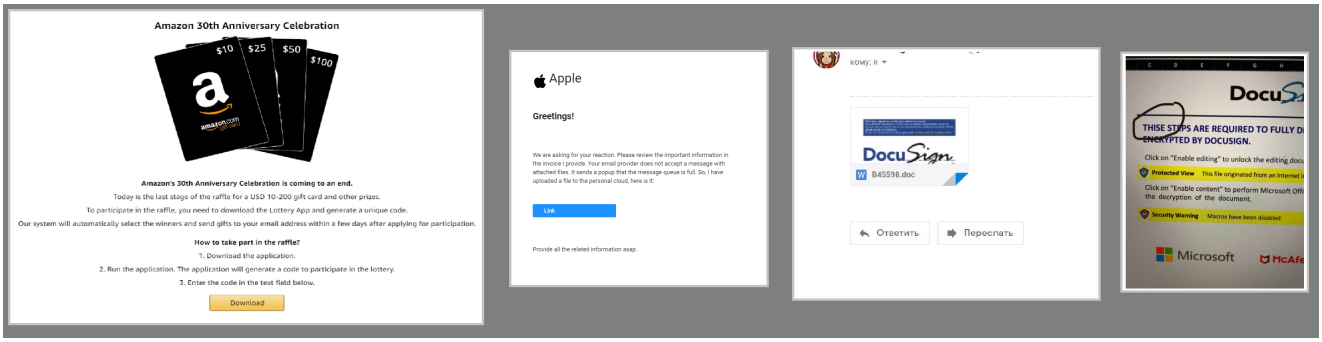


Fig. 2 - Example Phishing Email Templates used by Conti

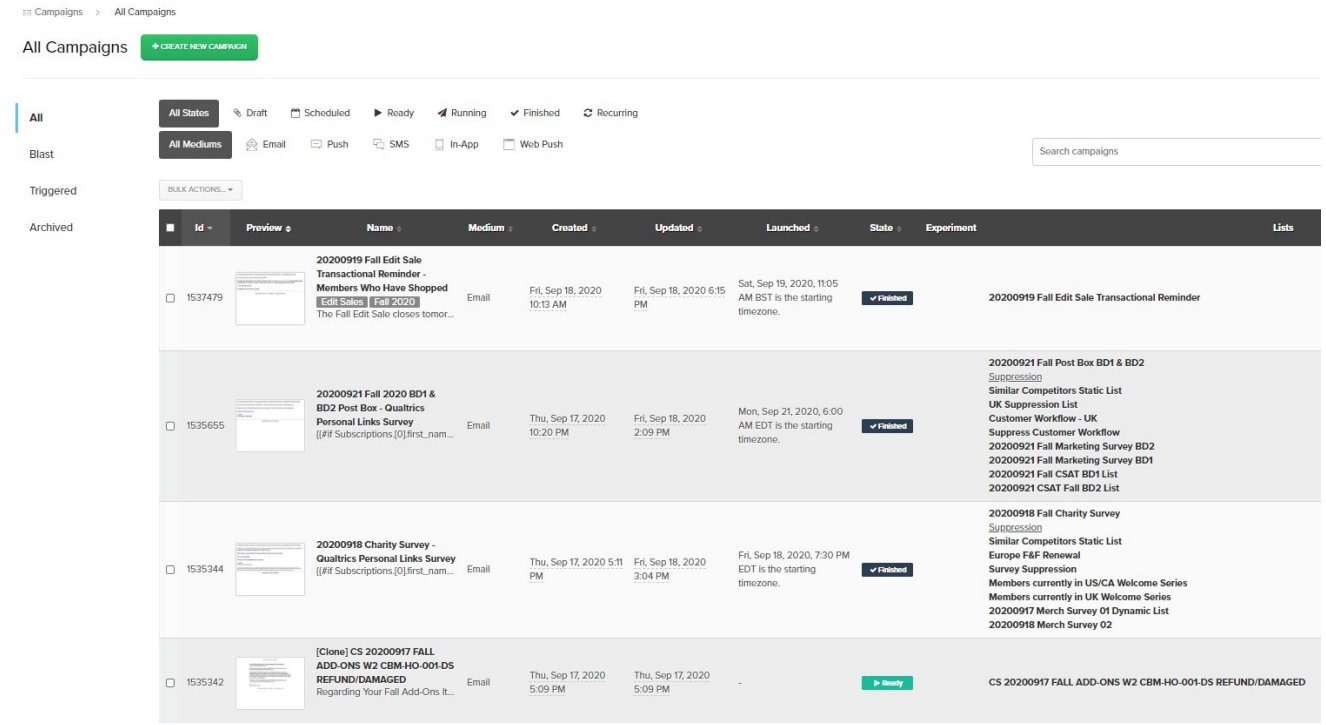


Fig. 3 - Iterable Email Marketing Dashboard shared in Conti Leaks in September 2020

Malware

The Conti Leaks revealed details on how a persistent cybercriminal operation develops its malware campaigns. The image below (see Fig. 4) highlights how the group works to test and develop its payloads against common detections systems used by its targets, such as ESET and Windows Defender.

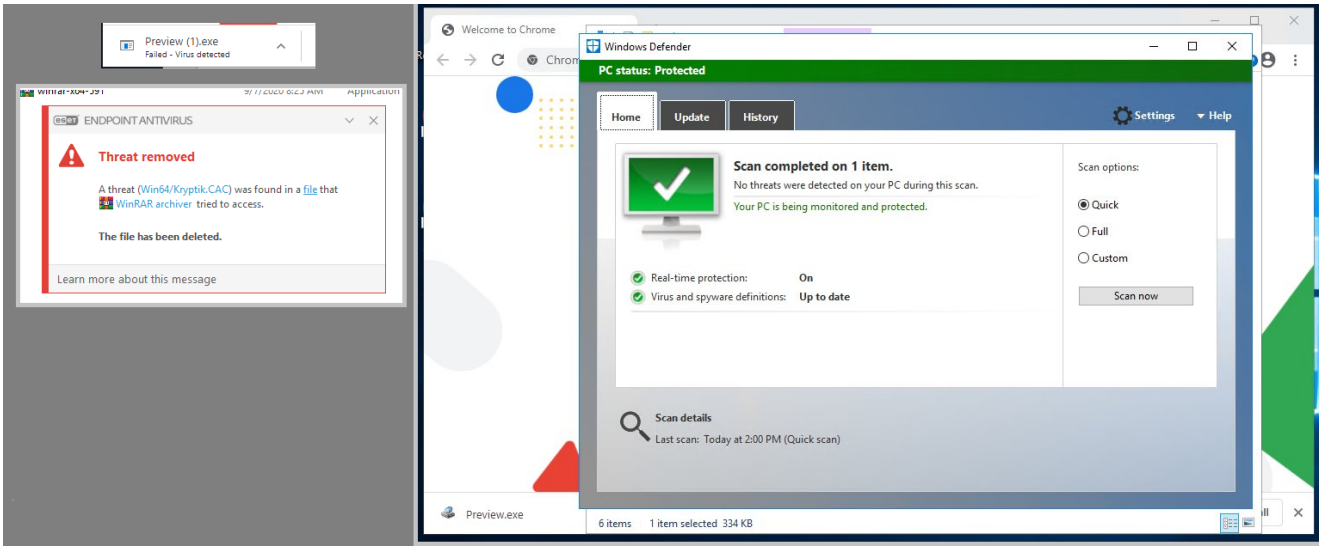


Fig. 4 - Conti members testing and making payloads fully undetectable (FUD)

Command and Control (C2)

Like any malware group, Conti needs server and hosting infrastructure to be able to launch its campaigns. This includes payload staging servers, proxy servers, C2 domains, Virtual Private Servers (VPS), and remote storage for exfiltrated data.

Fig. 5 - Conti members discussed using ZEHost for hosting

Fig. 6 - Unknown botnet C2 panel shared by a Conti member

Tradecraft, Exploits, and 0days

What sets Conti apart from the rest of their peers in the cybercrime ecosystem is that members of this ransomware group are innovators and quick to leverage newly disclosed techniques. The Conti Leaks revealed multiple techniques used by Conti that had not been previously discussed publicly online.


```
"_source": {
  "timestamp": "2020-09-17T12:10:22.354394",
  "from_user": "target@q3mcco35auwcstmt.onion",
  "to_user": "bentley@q3mcco35auwcstmt.onion",
  "body_ru": "нам нужен разработчик\nкоторый сможет получить акк девелопера в майкрасофт сторе\nчтобы там внутри апрувить в сторе файлы",
  "body_en": "we need a developer who will be able to get a developer account in the microsoft store in order to approve files in the store inside"
},
```

Fig. 7 - Conti member "target" stating intentions in September 2020 to acquire a developer account in the Microsoft Store to approve their own files


```
"timestamp": "2021-08-03 14:43:24",
"server": "wfy76wigkpoxqbe6.onion",
"channel": "general",
"from_user": "giovanni",
"attachment": "",
"body_ru": "Я по этомуману делал, вдруг поможет кому.\\n`https://www.bussink.net/ad-cs-exploit-via-petitpotam-from-0-to-domain-domain/`",
"body_en": "I used this mana, maybe it will help someone.\\n`https://www.bussink.net/ad-cs-exploit-via-petitpotam-from-0-to-domain-domain/`"
```

Fig. 8 - Conti member "giovanni" sharing a manual (aka "mana") for the PetitPotam exploit for Microsoft's NTLM authentication system in August 2021

```
"timestamp": "2021-06-11T07:03:36.101991",
"server": "185.25.51.173",
"from_user": "mango@q3mcco35auwcstmt.onion",
"to_user": "professor@q3mcco35auwcstmt.onion",
"body_ru": "Добрый день. Есть 0-day эксплойт повышения привилегий для уязвимости типа Use-after-Free в драйвере WIDFRD.sys. Эксплойт реализован для Windows 10 x64 1607, 1703, 1709, 1803, 1809, 1903, 1909. Уязвимость есть и в 2004 и
далее, но соответствующий код в драйвере был переписан, и падение ОС в BSOD происходит до срабатывания целевой уязвимости на разыменовании нулевого указателя. Есть некоторые нюансы по эксплуатации: не все системы могут быть уязвимы,
так как есть зависимость от конфигурации оборудования. Эксплуатация происходит путем отключения SMEP (модификация CR4), модификации PTE/PML4 при необходимости и выполнении кода, осуществляющего замену токена целевому процессу на
системный. Публикую объявление здесь, поскольку мои постоянным клиентам не нужен/не подошел, а в личке из тех, кто на форуме изъявил желание купить, никто не отвечает. Цена - 60к, обсуждаема. Желающим могу написать и выдать
утилиту, которая при запуске на интересующей системе скажет, уязвима ОС или нет. Первый контакт в ЛС, потом в жаббер.\n\n\nДополню:\n\nЭксплойт продается в одни руки.\n\nВидео работы:\n\nhttps://filetransfer.io/data-package/
ctyCDTW6#link\n\nПароль bvdiviy2861rVJVl\n\n \n\nЧто происходит на видео:\n\n1. Запускается процесс wud.exe, эксплуатирующий уязвимость.\n\n2. wud.exe создает процесс cmd.exe и делает 5-секундную паузу для проверки привилегий.\n\n3.
Запускаю из созданной консоли notepad.exe (экземпляр 1).\n\n4. Спустя некоторое время проверяю привилегии и запускаю notepad.exe (экземпляр 2).\n\n5. В Process Explorer-е проверяю уровень cmd.exe и поочередно 2 экземпляра notepad.
exe. Видно, что экземпляр 1 запущен со средним IL, второй (когда права cmd.exe уже были повышены) с SYSTEM.",
"body_en": "Good afternoon. There is a 0-day privilege escalation exploit for a Use-after-Free vulnerability in the WIDFRD.sys driver. The exploit was implemented for Windows 10 x64 1607, 1703, 1709, 1803, 1809, 1903, 1909. The
vulnerability exists in 2004 and later, but the corresponding code in the driver was rewritten, and the OS crashes into a BSOD before the target null pointer dereference vulnerability is triggered . There are some nuances in
operation: not all systems may be vulnerable, as there is a dependence on the hardware configuration. Operation occurs by disabling SMEP (modification CR4), modifying PTE / PML4 if necessary, and executing code that replaces the
token for the target process with the system one. I am publishing an ad here, because my regular customers do not need / did not fit, and in a personal message from those who expressed a desire to buy on the forum, no one answers.
Price - 60k, negotiable. For those who wish, I can write and issue a utility that, when launched on the system of interest, will tell whether the OS is vulnerable or not. The first contact in the LAN, then in the jabber. I will add:
The exploit is sold in one hand. Video of work: https://filetransfer.io/data-package/ctyCDTW6#link Password bvdiviy2861rVJVl What happens in the video: 1. The wud.exe process is launched, exploiting the vulnerability. 2. wud.exe
spawns a cmd.exe process and pauses for 5 seconds to check privileges. 3. I launch notepad.exe from the created console (instance 1). 4. After some time, I check the privileges and run notepad.exe (instance 2). 5. In Process
Explorer I check the cmd.exe level and alternately 2 instances of notepad.exe. It can be seen that instance 1 is launched with medium IL, the second (when the rights of cmd.exe have already been elevated) with SYSTEM."
```


Fig. 9 - Conti member "mango" sharing the opportunity to buy a 0day privilege escalation exploit in the Windows WIDFRD.sys driver for "60k" in June 2021


```
"_source": {
  "timestamp": "2020-06-25T14:11:07.737127",
  "from_user": "revers@q3mcco35auwcstmt.onion",
  "to_user": "stern@q3mcco35auwcstmt.onion",
  "body_ru": "[07:32:37] <revers> здарова \n[07:32:55] <revers> почитал я отчеты по группе турла \n[07:33:09] <revers> работают они уже более 10 лет \n[07:34:34] <revers> методы заражения так
    же как и у нас на сколько я понимаю спам с документами содержащими уязвимости алоба либо макросы \n[07:34:48] <revers> так же нион домены как и у нас \n[07:35:01] <revers> + еще добавлены
    связки сплойтов \n[07:35:23] <revers> и еще я обратил внимание на то что они снифит трафик и подменяют бинари \n[07:35:34] <revers> скорее всего это делается митмом \n[07:38:05] <revers>
    векторы распространения по сети используют в основном такие же как и у нас \n[07:38:19] <revers> ищут уязвимые хосты под сплойт мс17-10 \n[07:38:54] <revers> на сколько я отчетах написано
    исходя из реверса их софта приступствует кирилица из чего делается вывод что парни русские \n[07:39:19] <revers> только я одного не понял зачем они заражают пк на территории ру и снг \n
    [07:39:29] <revers> имен у группы много \n[07:43:34] <revers> и ее приравнивают к правительствым хакерам",
  "body_en": "[07:32:37]<revers> hello [07:32:55]<revers> I read the reports on the Turla group [07:33:09]<revers> they have been working for more than 10 years [07:34:34]<revers> infection
    methods are the same as ours, as far as I understand spam with documents containing adobe vulnerabilities or macros [07:34:48]<revers> just nion domains like ours [07:35:01]<revers> +
    bundles of sploys have been added [07:35:23]<revers> and I also noticed that they sniff traffic and replace binaries [07:35:34]<revers> most likely this is done by mitmo [07:38:05]<revers>
    propagation vectors over the network are used basically the same as ours [07:38:19]<revers> looking for vulnerable hosts for the ms17-10 sploit [07:38:54]<revers> how much is written in
    the reports, based on the reverse of their software, there is Cyrillic, from which it is concluded that the guys are Russian [07:39:19]<revers> only I didn't understand one thing why they
    infect PCs on the territory of ru and cis [07:39:29]<revers> the group has many names [07:43:34]<revers> and she is equated with government hackers"
},
```


Fig. 10 - Conti member "revers" shares that they read reports on the "Turla" group (a Russian cyber-espionage APT linked to the FSB)

A Cybercrime Empire

Researchers have stated that they believe Conti has up to 150+ members worldwide. If we do the math, each member is allegedly getting paid on average $2,000 per month which equals around roughly $300,000 per month in Conti "employee" salaries and roughly $3,600,000 per year. This is a LOT for a cybercrime group. With this amount of purchasing-power, it is only natural Conti leadership began to wonder about acquisitions and starting their own forums, carding shops, and even cryptocurrency platforms.

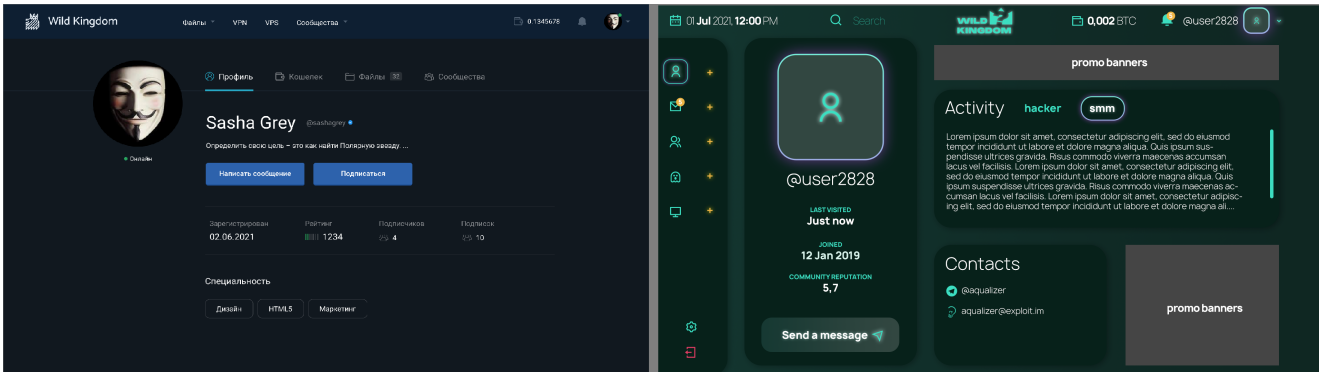


Fig. 11 - Conti members design what their new cybercrime forum might look like

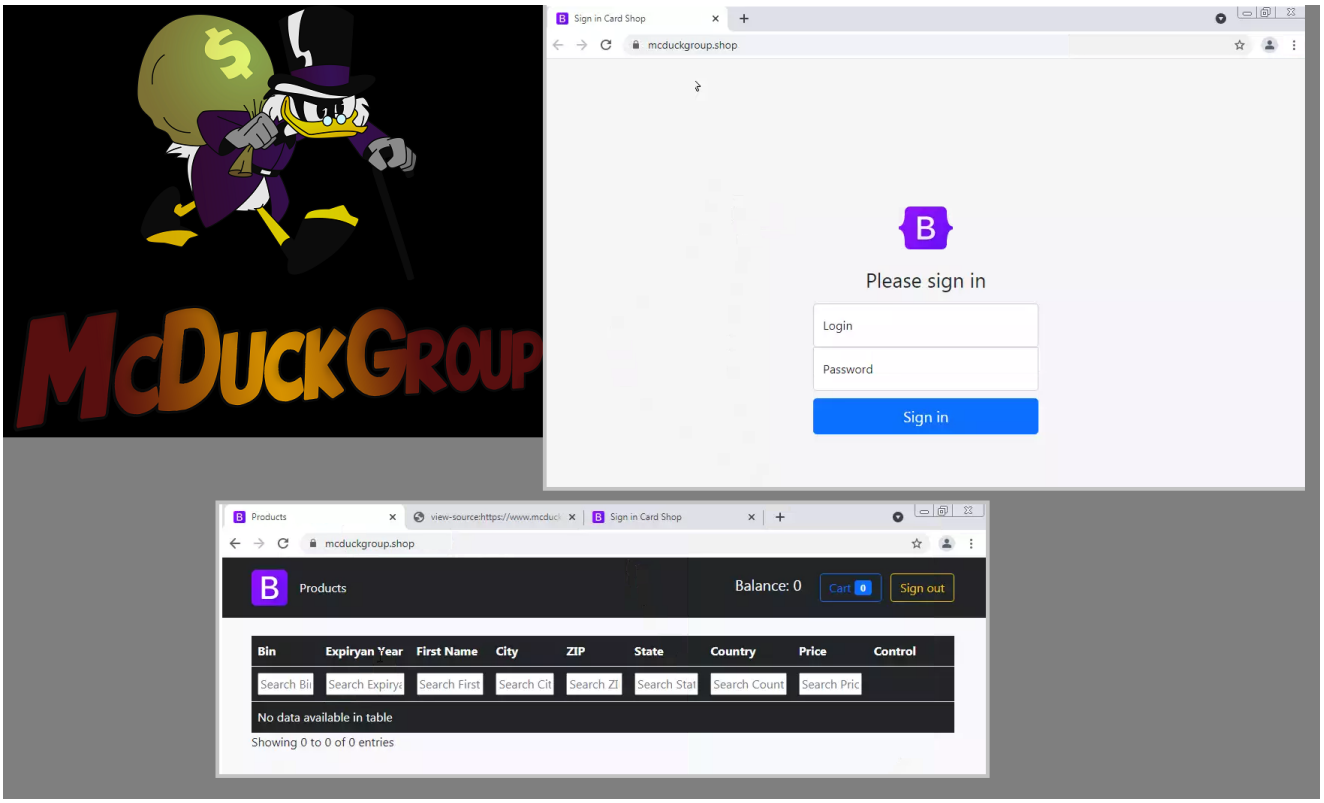


Fig. 12 - Logo of "McDuckGroup" shared to Conti Leaks

Researchers shared screenshots of all the links pasted into the Conti chats. One stood out to me: a logo with "McDuckGroup" and Scrooge McDuck. While some researchers I collaborate with theorized this was a ransomware rebrand, I managed to uncover it was the logo for a carding market currently under development. After Googling "McDuckGroup", a site called "mcduckgroup[.]shop" popped up as the first result. This is evidently a carding marketing due to the search bars for BIN numbers, Expiry dates, cardholder names, and addresses. Currently no data has been loaded onto the site.

Ransomware

A number of other ransomware groups are mentioned in the Conti Leaks. Trellix researchers highlighted how representatives of NetWalker, MAZE, and LockBit all have a presence in the Conti chat server. Ryuk, Diavol, REvil, AvosLocker, BlackMatter, and Crylock ransomware families are all also mentioned in the Conti Leaks.

```
<bomba777> did you see the news yesterday about the revil gang? [30.09.2020 11:15:30]
<bomba777> that they deposited lam bucks on the xss forum [30.09.2020 11:15:40]
<bomba777> people live :) [09/30/2020 11:16:00]
<gagarin66> yes, I saw the topic [09/30/2020 11:16:14]
<bomba777> here are the oligarchs.. [09/30/2020 11:16:24]
<gagarin66> well, I don't see a problem at all) [09/30/2020 11:16:27]
<gagarin66> yesterday here is 900k [09/30/2020 11:16:30]
<gagarin66> vylpata was) [09/30/2020 11:16:35]
<bomba777> by you? [30.09.2020 11:16:38]
<gagarin66> from maze [09/30/2020 11:16:38]
<gagarin66> yes [09/30/2020 11:16:44 AM]
<bomba777> fuck why am I the only poor one so far.. [30.09.2020 11:16:52]
<gagarin66> make bots"
```

Fig. 13 - "bomba777" and "gagarin66" (a MAZE affiliate) discuss REvil depositing 900k in Bitcoin to XSS[.]is


```
"timestamp": "2022-01-23 01:51:45",
"server": "xflemdsxjrjilw34dsxpvrxp5whnaut7hc5xejwuqs6eqrkt77bxkwid.onion",
"channel": "general",
"from_user": "rags",
"attachment": "",
"body_ru": "Парни криптовалюту походу запретять вплоть до уголовное преследования, а все благодоря кому? Revil поблагодарим этих челов что у них мозгов хватило снимать деньги и все что
  отжали, складывать на складе у себя в квартире, а теперь нам еще головная боль как свои кровные вывести в реал. Быстрыкин посидел подумал, ну думает это делитанты, а есть не делитанты, и
  че там он походу боится представить. =)",
"body_en": "Guys, it's a campaign to ban cryptocurrency up to criminal prosecution, and all thanks to whom? Revil thank these people that they had the brains to withdraw money and put
  everything they squeezed out in a warehouse in their apartment, and now we still have a headache how to bring our hard-earned money into real life. Bystrykin sat and thought, well, he
  thinks these are delitants, but there are not delitants, and why is he afraid to imagine a campaign. =)"
},
```


Fig. 14 - "rags" discusses REvil arrests in January 2022 by Russian FSB, blaming them for the alleged crackdown on cryptocurrency in Russia

Fig. 15 - "CRYPTOHAZARD" leak site linked to MAZE ransomware (newsmaze[.]top)


```
"timestamp": "2021-10-19T10:20:15.039922",
"server": "185.25.51.173",
"from_user": "mango@q3mcco35auwcstmt.onion",
"to_user": "stern@q3mcco35auwcstmt.onion",
"body_ru": " [RUS] Партнерская программа по вымогательству AvosLocker \n- ии доступны для Windows/Linux/ESXi. \n- Панель заседаний \n- Блог \n- Хранение/Эксфильтрация Данных \n\n[ENG]
  AvosLocker Ransomware Partnership Program \n- Lockers available for Windows/Linux/ESXi. \n- Negotiation panel \n- Blog \n- Data Storage/Exfiltration \n\nJabber:\navos@thesecure.
  biz\navos@strong.pm",
"body_en": "[ENG] AvosLocker Ransomware Affiliate Program - Affiliates available for Windows/Linux/ESXi. - Dashboard - Blog - Data Storage/Exfiltration [ENG] AvosLocker Ransomware
  Partnership Program - Lockers available for Windows/Linux/ESXi. - Negotiation panel - Blog - Data Storage/Exfiltration Jabber: avos@thesecure.biz avos@strong.pm"
```

```
"timestamp": "2021-08-02T20:57:47.024684",
"server": "185.25.51.173",
"from_user": "mango@q3mcco35auwcstmt.onion",
"to_user": "stern@q3mcco35auwcstmt.onion",
"body_ru": "Доброго времени суток.\n\nИщем:\n- Команды пентестеров к совместному сотрудничеству по Windows (EXE/DLL/PS1) и Linux (ESXi). Предоставим лучшие решения по совместной работе и
  хорошие условия.\n- Поставщиков сетей, выкупаем или работаем под %.\n\nКонтакты:\nJabber: blackmatter_interviews@exploit.im\nTOX ID:
  10D20B109E895D2FBC70F11E9A775825E9397B0B89FE00FDD96BA8158F8A542A39B311E2CEE6\n\nФорумы:\nExploit: /topic/191679/ (депозит 120к).\nXSS: /threads/54231/ \n\n======================\nЭто
  рекламная рассылка\n======================",
"body_en": "Good day. We are looking for: - Teams of pentesters for joint cooperation on Windows (EXE/DLL/PS1) and Linux (ESXi). We will provide the best collaboration solutions and good
  conditions. - Suppliers of networks, we redeem or work under %. Contacts: Jabber: blackmatter_interviews@exploit.im TOX ID:
  10D20B109E895D2FBC70F11E9A775825E9397B0B89FE00FDD96BA8158F8A542A39B311E2CEE6 Forums: Exploit: /topic/191679/ (120k deposit). XSS: /threads/54231/ ====================== This is a
  promotional email ================== ===="
```

Fig. 16 - "mango" and "stern" shared adverts for AvosLocker and BlackMatter

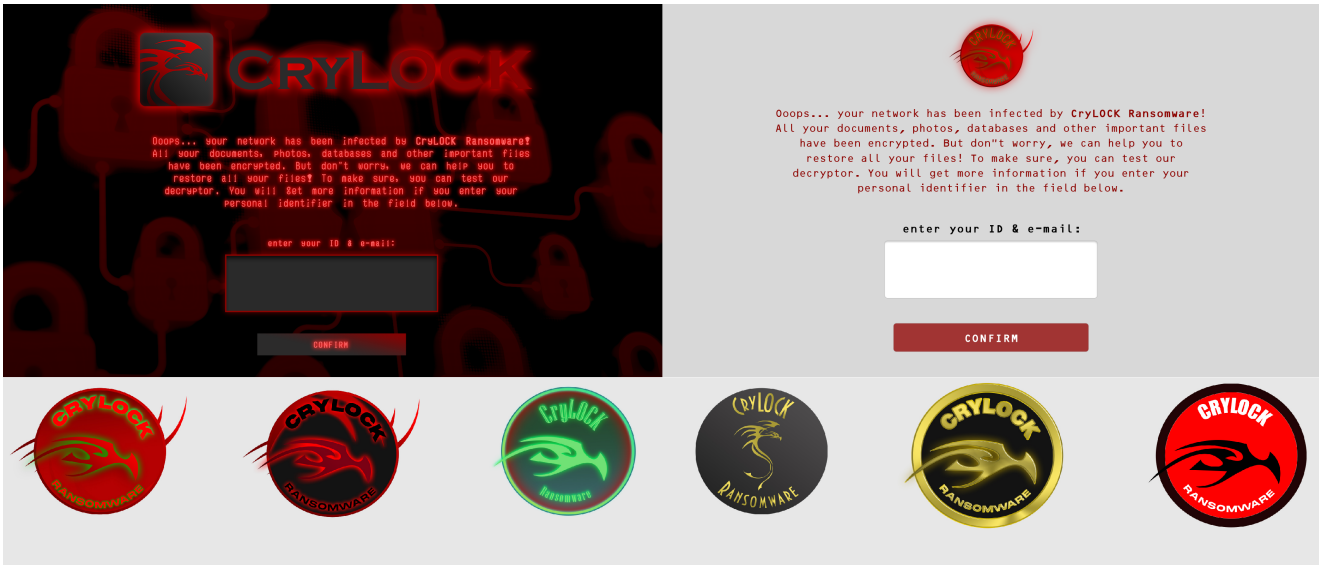


Fig. 17 - Logos and designs for CryLock ransomware shared to Conti server

```
#include "cryptor.h"
#include "mrph.h"
#include <comdef.h>
#include <Wbemidl.h>
#pragma comment(lib, "wbemuuid.lib")

STATIC CONST DWORD BufferSize = 5242880;
STATIC CONST BYTE g_ContiPattern[16] = { 0xab, 0xff, 0x63, 0xa1, 0x6f, 0xa2 , 0x6e, 0x6e, 0xa3, 0x74,
0x69, 0xbf, 0x4c, 0xdd, 0xff, 0xa1 };
STATIC process_killer::PPID_LIST g_WhitelistPids = NULL;


enum ENCRYPT_MODES {

    FULL_ENCRYPT = 0x24,
    PARTLY_ENCRYPT = 0x25,
    HEADER_ENCRYPT = 0x26

};
```

Fig. 18 - Conti V3 Locker source code disclosed publicly by @contileaks Twitter account

Samples of Conti v3

- locker.exe
  e1b147aa2efa6849743f570a3aca8390faf4b90aed490a5682816dd9ef10e473
- locker_x86.dll
  fb737da1b74e8c84e6d8bd7f2d879603c27790e290c04a21e00fbde5ed86eee3

- cryptor.exe
  5f3ae6e0d2e118ed31e7c38b652f4e59f5d5745398596c8b31248eda059778af

Closing Comments

The Conti Leaks have provided cybercrime researchers an unparalleled look into how Russian-speaking organized hacking groups operate. The leaks also supplement the Conti Playbook that was leaked by a disgruntled member in August 2021. As a community of cybersecurity researchers, we now know more about the Conti ransomware group than any other threat group in history.

For the Conti group itself, however, it appears to be business as usual (BAU). Less than one week after the Conti chats were leaked, new victims were uploaded to the ContiNews darknet site.

Fig. 19 - New victims added to ContiNews shortly after the Conti Leaks

BleepingComputer also reported on hacktivist groups, such as Network Battalion 65 (aka NB65), are leveraging a modified version of the leaked Conti v3 source code already. The group has targeted organizations in Russia for retribution over the invasion in Ukraine. (Sample available here)

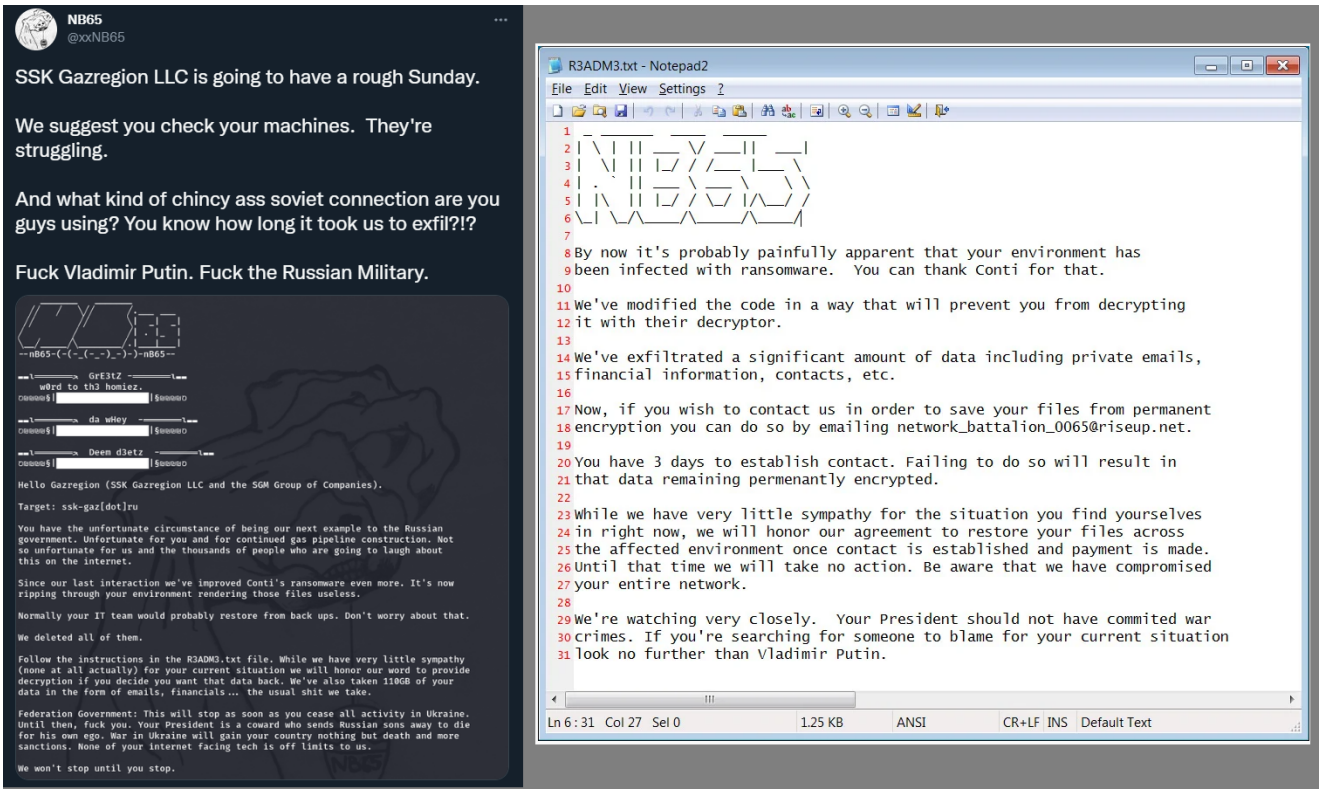


Fig. 20 - NB65 modified version of Conti v3 ransomware

Conti has seemingly recovered from the leaks and might be at the 'too big to fail' stage of operations. The Russian state is clearly fully aware of Conti's operations and allows them to operate with impunity. Researchers at Trellix highlighted the group's connections to the Russian state and how the intelligence services also benefit from Conti's coveted network access to high-profile organizations around the world.

Lastly, I hope you enjoyed the blog. There are still likely some secrets yet to be revealed in the Conti Leaks. I appreciate the help and resources shared by researchers online. S/O to Curated Intel, Trellix, Intel471, Secureworks, The DFIR Report, and researchers such as @vk_intel, @pancak3lullz, and @c3rb3ru5d3d53c, and many others!

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