

# Malware wars: the attack of the droppers

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## Another 130.000+ installations of malicious droppers from official store

A year ago, we [highlighted a trend](#) of malicious droppers in Google Play store used to distribute banking Trojans. We also predicted further efforts of cybercriminals to reduce the malicious footprint of their malware in order to stay undetected. Distribution through droppers on official stores remains one of the most efficient ways for threat actors to reach a wide and unsuspecting audience. Although other distribution methods are also used depending on cybercriminals targets, resources, and motivation, droppers remain one of the best option on price-efforts-quality ratio, competing with SMiShing.

## Distribution methods

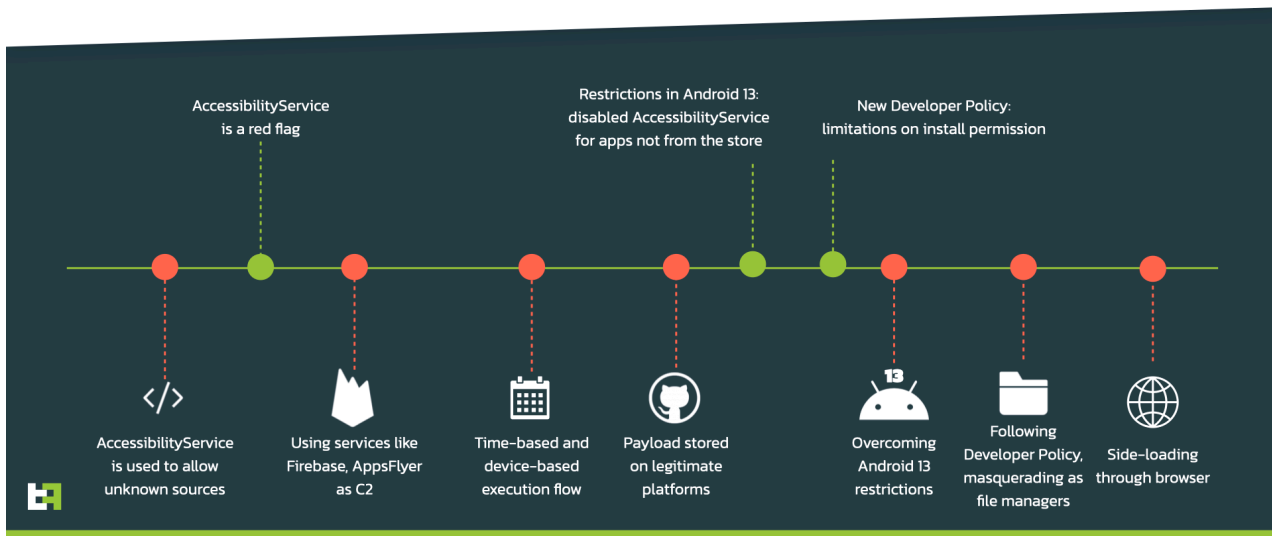
Ways to reach victims



The history of competition between malware authors and security mechanisms knows several twists when new measures are introduced. Droppers on Google Play went from using AccessibilityService to auto-allow installation from unknown sources to using legitimate sources to control them and store malicious payloads. Following the updates to the “Developer Program Policy” and system updates, actors immediately introduce new ways to sneak to the official store, overcoming limitations or adjusting droppers to follow the guidelines and not arouse suspicion. A brief story of that battle is presented on the graph below.

# Evolution of droppers

Non-stopping competition with security mechanisms



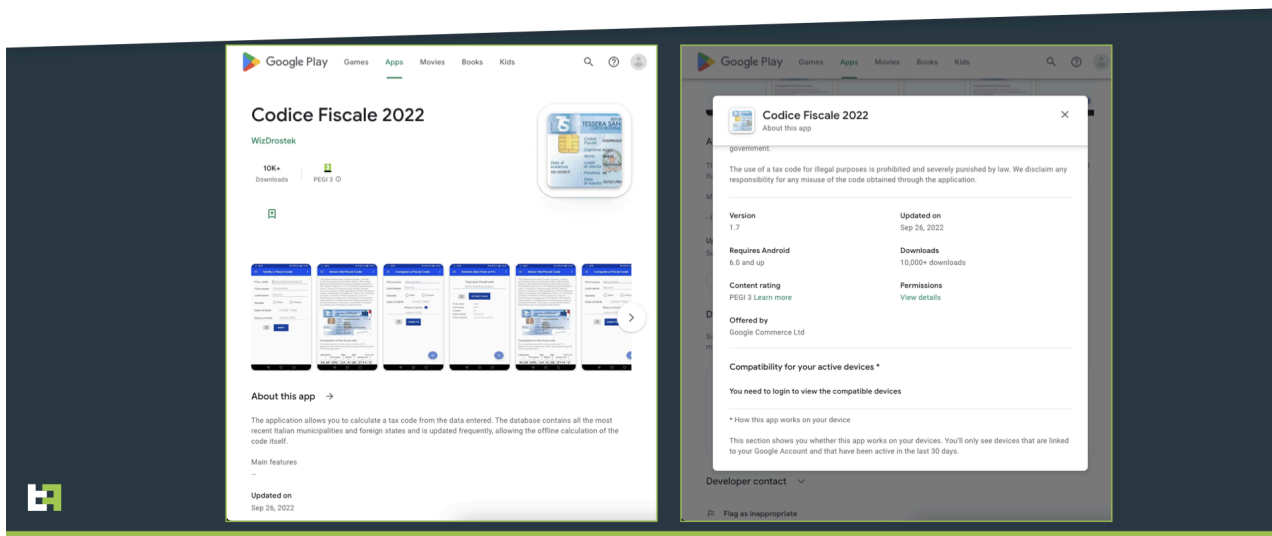
In this blog we uncover additional tactics cybercriminals use in new Google Play droppers discovered by ThreatFabric analysts. These droppers have cumulative number of **130k+** installations distributing Sharkbot and Vultur banking Trojans.

## Sharkbot: the less you see, the more they get

In the beginning of October 2022 ThreatFabric analysts spotted a new campaign of banking Trojan Sharkbot, targeting Italian banking users. This campaign involved Sharkbot **version 2.29 – 2.32**. Following the research path, our analysts were able to identify the dropper app located on Google Play with 10k+ installations and disguised as an app to calculate tax code in Italy (“Codice Fiscale”) targeting Italian users.

# Sharkbot dropper

Targeting Italy, 10k+ installations




This is not the first time that a Sharkbot dropper sneaks into the official Google store, but this time authors did their best to hide the malicious intents of the dropper. Previous versions of Sharkbot droppers as well as other droppers (including those we highlight below in this blog) include ability to download, install and launch the malicious payload. Obviously, such behaviour is quite suspicious and already made Google to introduce changes to the [Developer Program Policy](#) where usage of **REQUEST\_INSTALL\_PACKAGES** permission was limited to apps that have it as core functionality.

However, in this new iteration, Sharkbot dropper authors tried their best to not include suspicious permissions at all, thus maintaining an extremely low profile. The new dropper has only 3 permissions that are quite common.

## Sharkbot dropper

No suspicious permissions

| Icon / App name / Package name   | Malware family | Malware variant   |
|--|----------------|-------------------|
|  Codice Fiscale 2022 (com.italytaxcode.app)<br>5649fb11661e059af276127be2ea688471fec7cd3b1f4b2745a7d2b048cc26 | SharkBot       | SharkBotDropper.C |

| Analysis    |   | Hosts | C2s |
|-------------|---|-------|-----|
| <b>IOCs</b> |   |       |     |
| md5         | e3d42c66e0f3e62daccf3341c20c7ed0  |       |     |
| sha1        | a86baeffb68c6594a5343ce47b05f7ea79db68f5  |       |     |
| sha256      | 5649fb11661e059af276127be2ea688471fec7cd3b1f4b2745a7d2b048cc26                              |       |     |
| ssdeep      | 49152:1Q89Q0cPmBezyFmK9XM65R2Fu5Hr5xLmbhFg/c+n/FqWwg6zCofrxnPe:QONeOyFmK9XDKL5xjFqWJofrxnoe |       |     |
| cert_sha1   | 86639b9a94b4bc8c08307d3156bd8157eab97498  |       |     |
| icon        | 68a01b938aba2ce978b664fd87eb154fc92571dae06bc6b96295ad5505c2fc1d                            |       |     |

| App              | Permissions (3)      |
|------------------|----------------------|
| Size             | 3.52 MB              |
| label            | Codice Fiscale 2022  |
| package          | com.italytaxcode.app |
| minSdkVersion    | 23                   |
| targetSdkVersion | 31                   |

- android.permission.INTERNET
- android.permission.WRITE\_EXTERNAL\_STORAGE
- android.permission.READ\_EXTERNAL\_STORAGE

To ensure that the dropper is launched on a real targeted device, the app obtains the SIM country and compares it to “it” (Italy): if not matched, no malicious activity will be performed. Besides, additional checks are made on the C2 side to ensure that the dropper is running on the targeted device: if C2 is reached from a non-Italian IP address, the C2 will respond with a default “exit” message. Otherwise, it will receive a configuration data with the URL containing the payload.

# C2 communication

Filtering unwanted devices

The image shows two screenshots of a network traffic analysis tool. The top screenshot shows a request from IP 32e0ba9c4db345b5f5db0f2994ecfe8e87a8bcb1165d7f3b2110d320a2cf1622b2a55c9ef0cc110f96a960f68a3ad21aa05eb53156e and a response from IP 78aae914ded57aaa5cac13988f0a4ce9ee7. The bottom screenshot shows a request from IP 66eab4c818b752a1b28a8e2a83e3b5d387a8bcb1165d7f3b2110d320a2cf1622b2a55c9ef0cc110f96a960f68a3ad21aa05eb53156e86aa and a response from IP 78aae914ded57aaa5cac13988f0a4ce9ee7. To the right of the screenshots, there are two text blocks: 'Unwanted IP response: { "package": "exit" }' and 'Italian IP response: { "package": "file", "file": "\*URL\*" }'.

Here the interesting part starts: in order to avoid using REQUEST\_INSTALL\_PACKAGES permission, the dropper opens a fake Google Play store page impersonating Codice Fiscale app page. It contains fake information about the number of installations and reviews, and urges the victim to perform an update. Shortly after the page is opened, the automatic download starts. Thus, the dropper outsources the download and installation procedure to the browser, avoiding suspicious permissions.

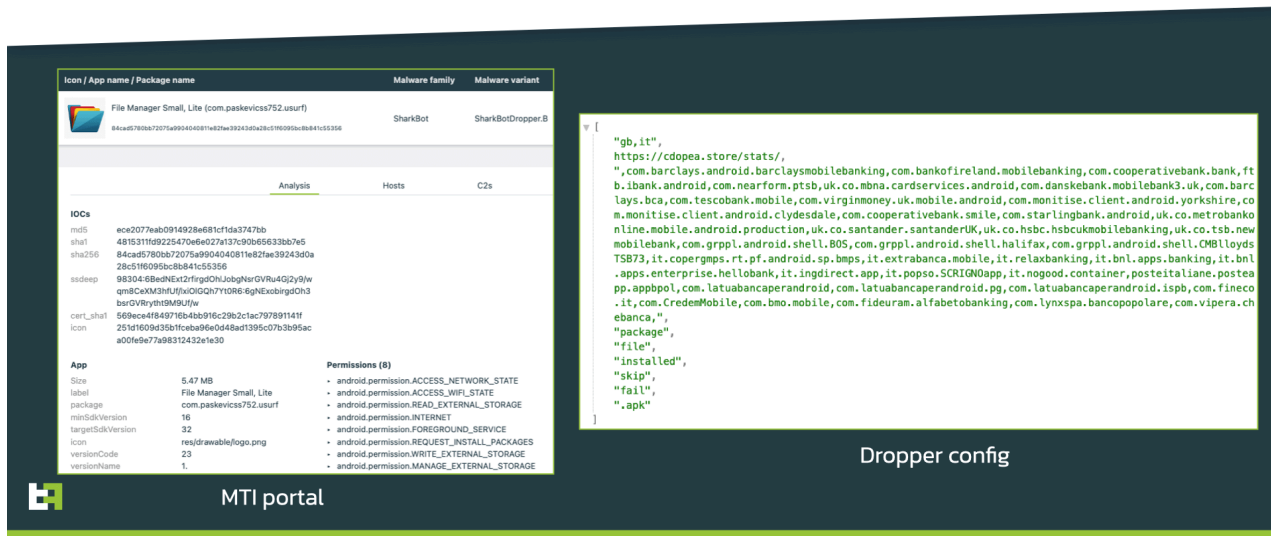
The slide is titled 'Fake update page' and has a subtitle 'Pretending to be official store update'. It features two screenshots of a mobile browser. The left screenshot shows a page for 'Codice Fiscale 2022' with a 4.4 star rating, 500M+ downloads, and 1.48M reviews. There is an 'Update' button and a 'Data safety' section. The right screenshot shows the same page but with a warning dialog box: 'File might be harmful. Do you want to download Codice Fiscale 2022.NEW\_V5\_FREE.apk anyway?'. The dialog has 'Cancel' and 'Download anyway' options.

Obviously, such approach requires more actions from the victim, as the browser will show several messages about the downloaded file. However, since victims are sure about the origin of the application, they will highly likely install and run the downloaded Sharkbot payload.

During our investigation, we also found another Sharkbot dropper available on Google Play. It had zero installations at the time of discovery and was quickly removed from the website. The interesting detail about this dropper was that it had the REQUEST\_INSTALL\_PACKAGES permission in place and operated more in line with usual dropper’s behaviour. Actors were also following the updated policy of Google, as this dropper was masqueraded as file manager, a category that is allowed to have this permission due to it being a core functionality.

## Another dropper

Following the policy: File Manager as a disguise



Similarities in code, C2 communication, and encryption used lead us to the same author behind the older versions of Sharkbot dropper, trying to reduce footprints and stay undetected.

### Targets

The new “Codice Fiscale” dropper discovered by ThreatFabric is configured to distribute Sharkbot payload to Italian users only, while the other “File Manager” dropper has Italy and UK in its configuration. At the same time, the payload delivered still has banks from Italy, UK, Germany, Spain, Poland, Austria, US, and Australia in its target list. Please, find the full target list in [Appendix](#).

### Vultur: Brunhilda is back

Another malware family that has been very active in the last year has been Vultur. [First discovered by ThreatFabric in July 2021](#), Vultur is an Android banking trojan which specializes in stealing PII from infected devices using its screen-streaming capabilities. It is also able to create a remote session on the device using VNC technology to perform actions on the victim’s device, effectively leading to On-Device Fraud (ODF).

Upon discovery, ThreatFabric first reported the strong connection between this malware family, and the “**Brunhilda Project**” crew. This Threat Actor was known for its central role in the distribution sector of the Android Banking malware landscape thanks to its dropper applications, which managed often to pass Google security checks and be approved on the Google Play Store. Initially, the Brunhilda droppers were deploying a variety of Android malware applications, like for example samples of the malware family Alien. However, after the first discovery of Vultur, every dropper found on the Google Play Store only installed samples belonging to the Vultur malware family.

Recently, ThreatFabric discovered 3 new Droppers on the Google Play store, ranging from 1.000 to 100.000 installations reported by Google. As previous campaigns observed throughout 2022, these droppers pose as applications like security authenticators, or file recovery tools.

# Vultur Campaigns

Strong connections with Brunhild Project Droppers

The image shows a screenshot of the Google Play Store interface. On the left, three app listings are visible: 'My Finances Tracker: Budget, C' by Dijitality Solutions, 'Zetter Authenticator' by urbanTechnologies, and 'Recover Audio, Images & Videos' by xed tech. On the right, a table lists these apps with their package names and the associated Vultur campaign name.

|  |  |        |
|--|--|--------|
|  | My Finances Tracker (com.ioster.lobster)<br>71c21d5e04d3ee0155763c325be43d76c59614f8c1bf2f0f679941e78df81d5f     | Vultur |
|  | Zetter Authenticator (com.pleasant.future)<br>7914af448b52846268a82e3f86a7c7f860e86bf4e42d9de2e9c645db0f6d728bf9 | Vultur |
|  | Recover Files (com.rec.cutfilessec)<br>5b3e559d26683fa786d75bbba8a4210d6e5135c367d67bcfeb5882f52ee5a96           | Vultur |

Many ongoing campaigns, high volume in the targeted areas.

Distributed via Google Play Droppers.

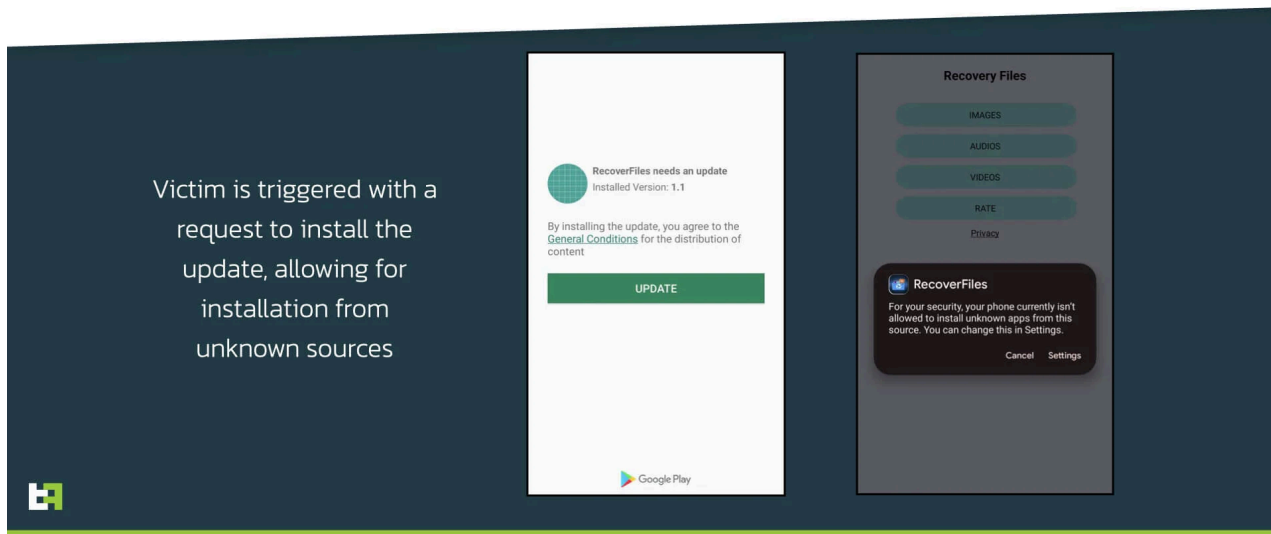
More than 110 thousand installations reported by Google

## The Dropper

The dropper applications are consistent with the droppers that we reported in our first blog about Vultur, and the modus operandi has not changed much with respect to older variants. As usual, the dropper is made of a trojanized application, which provides the advertised functionality, as well as the hidden dropper functionality. As previously reported, the dropper initially sends a registration message to its C2 server. As a response, the server sends back an appToken, which is then used in the following requests to identify the device. At this point, the dropper prompts the victim with a screen asking to download an **update** for the current application. If the user accepts the displayed request, the dropper proceeds to install Vultur.

# Payload Installation

Tricking the victim into installing a fake update



Victim is triggered with a request to install the update, allowing for installation from unknown sources

In terms of execution of the installation, there are no real updates from previous versions of Brunhilda. However, the dropper currently implements a few obfuscation techniques which were not present in initial versions of the dropper. Firstly, in these new version, the installation logic is not contained in the main DEX file, but in a additional dex file which is loaded dynamically. This additional step can complicate the life of researchers, making it harder to identify the code responsible for malicious activity.

The latest version of Brunhilda also implemented a new layer of obfuscation, which encrypts strings by using AES with a varying key, which is included in the byte array that is given as input to the decryption method, as explained in the picture below:

## String Obfuscation

Using AES

```
public static String decryptString(byte[] encryptedBytes) {
    byte[] arr_b1 = cryptoUtils.getArraySubset(encryptedBytes, 0, encryptedBytes.length - 0x10);
    SecretKeySpec secretKeySpec0 = new SecretKeySpec(cryptoUtils.getArraySubset(encryptedBytes, encryptedBytes.length - 0x10, encryptedBytes.length), "AES");
    try {
        Cipher cipher0 = Cipher.getInstance(String.join("/", new CharSequence[]{"AES", "ECB", "PKCS5Padding"}));
        cipher0.init(1, secretKeySpec0);
        return new String(cipher0.doFinal(arr_b1), StandardCharsets.UTF_8);
    } catch (Exception unused_ex) {
        throw new RuntimeException();
    }
}
```

EC721876DF18102015E61881652B666C

666F 4E4E 5654 3568 5335 5252 6738 6262

Encrypted data

AES Key



Once the payload is installed, the Brunhilda dropper launches the malware, and then continues existing on the device, acting as the application it is posing as.











## Vultur

These Brunhilda droppers all deploy samples belonging to a **novel variant** of Vultur Android Banking malware family.

This new variant maintains the Modus Operandi that characterized the original samples from 2021: once installed, the malware initiates a connection with its C2, and after registering it obtains its configuration containing its targets. Vultur features two separate target lists: one for screen-streaming targets and one for keylogging targets. Similarly to its older variant, the keylogging targets are social and messaging applications, while the screen-streaming targets are applications for online banking and cryptocurrency exchange. However, in this new variant, this second set of targets is also the list of applications for which extensive accessibility logging is performed.

# Vultur Android Banking Trojan

ODF Fraud

| Entry   | Monetisation   | ATO Fraud   | On-device fraud   | Resilience   |
|---|--|---|---|--|
| <br>Gp Dropper - Brunhilda | <br>Push/SMS interception | <br>Screen Streaming               | <br>hRAT | <br>Prevent uninstall |
|   | <br>Contact harvesting    | <br>Keylogger                      |   | <br>AV evasion        |
|                            |  | <br>Accessibility Logging<br>(NEW) |   |  |

By accessibility logging we mean the extensive logging of all UI elements and all the events associated with them (like for example clicks, gestures, etc). This is not a novel technique, but it is the first time we see it implemented in Vultur. This might be a solution to the issue created by a security flag often used in these banking applications: Android offers a way to tag the content of the window as secure, by using the “**FLAG\_SECURE**”, which prevents it “from appearing in screenshots or from being viewed on non-secure displays”. ThreatFabric tested this and is able to confirm that windows with this flag enabled only show a **black screen** during screen-streaming. However, if the **keyboard** is opened during interaction with the secured app, it **will be visible** on the recording as well as all the keys pressed by victim leading to potential theft of input data. In this case, it is possible to obtain enough information to steal credentials even with a black screen, when all the UI events are logged and sent to the C2.

# Addition of Accessibility Logging

In addition to screen streaming

The new variant of Vultur added the capability to extensively log elements of the UI

```
{
  "package": "[REDACTED]",
  "text": [],
  "root": {
    "class": "android.widget.FrameLayout",
    "bounds": {
      "left": 28,
      "top": 970,
      "width": 1024,
      "height": 542
    },
    "child": [
      {
        "class": "android.widget.TextView",
        "text": "Waarschuwing",
        "id": "[REDACTED]:id/alertTitle",
        "bounds": {
          "left": 133,
          "top": 1039,
          "width": 814,
          "height": 71
        },
        "child": [],
        "clickable": false,
        "selected": false,
        "uid": "0"
      },
      {
        "class": "android.widget.TextView"
      }
    ]
  }
}
```

Solution against the FLAG\_SECURE security feature of Android



In our previous blog we documented through our research why we believe that Vultur, the malware downloaded by these droppers, is a malware family that is not only distributed, but also created by the criminals behind the Brunhilda Project. In addition to the reasons discussed in our previous blog, which focus on the networking protocol used, new variants of Vultur also adopted the very same string obfuscation algorithm discussed in the previous section about the Brunhilda Dropper, further confirming our beliefs about the connection between these two malware families.

## Targets

These new Brunhilda-Vultur campaigns have been very active and successful in the last few months, reaching more than 100.000 potential fraud victims. Based on our research and investigation, in addition to cryptowallets which have always been in the target list, the largest campaign we observed focused on UK and Netherlands, while the two smaller and more recent ones switched to Germany, France, and Italy. Full target list of Vultur is provided in [Appendix](#).

## Conclusion

Another trend predicted by ThreatFabric's experts comes true and looks like it is here to stay. Malicious dropper applications still find their way to sneak in the official store despite the changes made to the policy and security mechanisms. Distribution through droppers on Google Play still remains the most "affordable" and scalable way of reaching victims for most of the actors of different level. While sophisticated tactics like [telephone-oriented attack delivery](#) require more resources and are hard to scale, droppers on official and third-party stores allow threat actors to reach wide unsuspecting audience with reasonable efforts. Such way of distribution of Android banking Trojans is very dangerous as victims may stay unsuspecting for a long time and may not alert their bank about suspicious transactions made without their knowledge. Thus it is very important to take actions on the organisation side to detect such malicious apps and their payloads as well as suspicious behaviour happening on customer's device.

We at ThreatFabric always report malicious droppers we identified to remove it from official stores and limit its further distribution. Financial organisations are welcome to contact us: if you suspect some app be involved in malicious activity, feel free to reach our Mobile Threat Intelligence team which will provide additional details and help with reporting the malicious app if identified: [mti@threatfabric.com](mailto:mti@threatfabric.com).

## Fraud Risk Suite

ThreatFabric's Fraud Risk Suite enables safe & frictionless online customer journeys by integrating industry-leading mobile threat intel, behavioural analytics, advanced device fingerprinting and over 10.000 adaptive fraud indicators. This will give you and your customers peace of mind in an age of ever-changing fraud.

## Appendix

### Sharkbot Droppers

| App name                 | Package name            | SHA-256  |
|--------------------------|-------------------------|--|
| Codice Fiscale 2022      | com.iatalytaxcode.app   | 5649fb11661e059a6fa276127be2ea688471fec7cd3b1f4b2745a7d2b048cc26 |
| File Manager Small, Lite | com.paskevicss752.usurf | 84cad5780bb72075a9904040811e82fae39243d0a28c51f6095bc8b841c55356 |

### Sharkbot Samples

| App name        | Package name                 | SHA-256  |
|-----------------|------------------------------|--|
| _Codice Fiscale | com.hzpwksdljgeibc.gmzjwdule | 0cbd727b7fa8d9938746475e91fb22a46b75cdcca2778db78073e3c3da70ad31 |
| _Codice Fiscale | com.gxulzkj.atuqczml         | 008338b39c0abf3aa75e92e845c34ac60e049a480eb1e0ab8d3147085a7bb745 |

### Brunhilda Droppers

| App name             | Package name               | SHA-256  |
|----------------------|----------------------------|--|
| My Finances Tracker  | com.all.finance.plus       | 0626e98f9988c63684e575d7a0df839240f7963aed38f82010e63b1b85a9ef61 |
| RecoverFiles         | com.umac.recoverallfilepro | e94a6f7dcd4b8c18110993f118f86d3cbfe1faf330f9968aaa7095dd189a4    |
| Zetter Authenticator | com.zetter.fastchecking    | 54139e2e008ed2ebcb4fc71d8aa2470727a724c8607464d9c3688e9506952529 |

### Vultur Samples

| App name     | Package name               | SHA-256  |
|--------------|----------------------------|--|
| RecoverFiles | com.accessible.recoverypro | cae3a48013fcea931f6b84e196f625e27017a1cdc97c1d86c8077db431abd508 |

| App name             | Package name       | SHA-256  |
|----------------------|--------------------|--|
| Zetter Authenticator | com.zforce.setupex | 8584d43067535dc97d12c4565e1636e3a1963421fe811ff6e58b4dbd7e5b947d |

## Sharkbot Targets

| Package name                               | App name   |
|--|--|
| au.com.nab.mobile                          | NAB Mobile Banking                                 |
| at.erstebank.george                        | George Österreich                                  |
| com.grppl.android.shell.BOS                | Bank of Scotland Mobile Banking: secure on the go  |
| de.number26.android                        | N26 — The Mobile Bank                              |
| co.bitx.android.wallet                     | Luno: Buy Bitcoin, Ethereum and Cryptocurrency     |
| com.fineco.it                              | Fineco   |
| com.paypal.android.p2pmobile               | PayPal Mobile Cash: Send and Request Money Fast    |
| es.lacaixa.mobile.android.newwapicon       | CaixaBank  |
| com.targo_prod.bad                         | TARGOBANK Mobile Banking                           |
| com.grppl.android.shell.halifax            | Halifax: the banking app that gives you extra      |
| pl.pkobp.iko                               | IKO  |
| org.stgeorge.bank                          | St.George Mobile Banking                           |
| it.bnl.apps.banking                        | BNL  |
| com.vipera.chebanca                        | CheBanca!  |
| uk.co.santander.santanderUK                | Santander Mobile Banking                           |
| com.wf.wellsfargomobile                    | Wells Fargo Mobile                                 |
| com.starfinanz.smob.android.*              | Sparkasse  |
| piuk.blockchain.android                    | Blockchain Wallet. Bitcoin, Bitcoin Cash, Ethereum |
| com.commbank.netbank                       | CommBank   |
| es.unicajabanco.app                        | Unicaja Banco                                      |
| uk.co.mbna.cardservices.android            | MBNA - Card Services App                           |
| de.postbank.finanzassistent                | Postbank Finanzassistent                           |
| com.barclays.android.barclaysmobilebanking | Barclays   |
| com.konylabs.capitalone                    | Capital One® Mobile                                |

| Package name                           | App name                                   |
|--|--|
| com.advanzia.mobile                    | Advanzia                                   |
| uk.co.tsb.newmobilebank                | TSB Mobile Banking                         |
| com.latuabancaperandroid               | Intesa Sanpaolo Mobile                     |
| com.citi.citimobile                    | Citi Mobile®                               |
| com.virginmoney.uk.mobile.android      | Virgin Money Mobile Banking                |
| com.grppl.android.shell.CMBLloydsTSB73 | Lloyds Bank Mobile Banking: by your side   |
| posteitaliane.posteapp.appbpol         | BancoPosta                                 |
| com.lynxspa.bancopopolare              | YouApp                                     |
| de.commerzbanking.mobil                | Commerzbank Banking - The app at your side |
| uk.co.hsbc.hsbcukmobilebanking         | HSBC UK Mobile Banking                     |
| com.CredemMobile                       | Credem                                     |
| com.starlingbank.android               | Starling Bank - Better Mobile Banking      |
| com.binance.dev                        | Binance - Buy & Sell Bitcoin Securely      |
| com.cooperativebank.bank               | The Co-operative Bank                      |
| com.transferwise.android               | TransferWise Money Transfer                |
| com.usbank.mobilebanking               | U.S. Bank - Inspired by customers          |

### Vultur Targets

| Package name                  | Application name                                     |
|-------------------------------|--|
| asia.coins.mobile             | Coins.ph Wallet                                      |
| be.aion.android.app           | Aion Bank  |
| btc.org.freewallet.app        | Bitcoin Wallet. Buy & Exchange BTC coin – Freewallet |
| bvm.bvmapp                    | Knab Bankieren                                       |
| cash.klever.blockchain.wallet | Klever Wallet: Buy Bitcoin, Ethereum, Tron, Crypto   |
| cedacri.mobile.bank.crbolzano | isi-mobile Cassa di Risparmio                        |
| cedacri.mobile.bank.esperia   | Mediobanca Private Banking                           |
| co.bitx.android.wallet        | Luno: Buy Bitcoin, Ethereum and Cryptocurrency       |
| co.clabs.valora               | Valora - Crypto Wallet                               |
| co.edgesecondapp              | Edge - Bitcoin, Ethereum, Monero, Ripple Wallet      |

| <b>Package name</b>                        | <b>Application name</b>                            |
|--|--|
| co.mona.android                            | Crypto.com - Buy Bitcoin Now                       |
| co.uk.Nationwide.Mobile                    | Nationwide Banking App                             |
| com.CredemMobile                           | Credem   |
| com.IngDirectAndroid                       | ING France   |
| com.VBSmartPhoneApp                        | BankUp Mobile                                      |
| com.abnamro.nl.mobile.payments             | ABN AMRO Mobiel Bankieren                          |
| com.americanexpress.android.acctsvcs.it    | Amex Italia  |
| com.americanexpress.android.acctsvcs.uk    | Amex United Kingdom                                |
| com.arkea.android.application.cmb          | Crédit Mutuel de Bretagne                          |
| com.bankid.bus                             | BankID säkerhetsapp                                |
| com.banknorwegian                          | Bank Norwegian                                     |
| com.barclays.android.barclaysmobilebanking | Barclays   |
| com.barclays.bca                           | Barclaycard  |
| com.bbva.italy                             | BBVA Italia Banca Online                           |
| com.binance.dev                            | Binance - Buy & Sell Bitcoin Securely              |
| com.bitcoin.mwallet                        | Bitcoin Wallet                                     |
| com.bitfinex.mobileapp                     | Bitfinex   |
| com.bitpanda.bitpanda                      | Bitpanda - Buy Bitcoin in minutes                  |
| com.bittrex.trade                          | Bittrex Global                                     |
| com.bituniverse.portfolio                  | BitUniverse:Crypto Trading Bot                     |
| com.boursorama.android.clients             | Boursorama Banque                                  |
| com.breadwallet                            | BRD Bitcoin Wallet. Buy BTC Bitcoin Cash, Ethereum |
| com.bunq.android                           | bunq - bank of The Free                            |
| com.bybit.app                              | Bybit: Crypto Trading Exchange                     |
| com.caisseepargne.android.mobilebanking    | Banque   |
| com.cic_prod.bad                           | CIC  |
| com.cm_prod.bad                            | Crédit Mutuel                                      |
| com.coinbase.android                       | Coinbase – Buy & Sell Bitcoin. Crypto Wallet       |

| <b>Package name</b>                    | <b>Application name</b>                            |
|--|--|
| com.coinbase.pro                       | Coinbase Pro – Bitcoin & Crypto Trading            |
| com.coinbase.wallite                   | Coinbase Wallet Lite                               |
| com.coinomi.wallet                     | Coinomi Wallet :: Bitcoin Ethereum Altcoins Tokens |
| com.coinspot.app                       | CoinSpot - Buy & Sell Bitcoin                      |
| com.comeco.teo                         | TEO - Das neue Multibanking                        |
| com.cooperativebank.bank               | The Co-operative Bank                              |
| com.crypterium                         | Crypterium Bitcoin Wallet                          |
| com.crypto.multiwallet                 | Guarda Crypto Bitcoin Wallet                       |
| com.cryptonator.android                | Cryptonator cryptocurrency wallet                  |
| com.db.pbc.miabanca                    | La Mia Banca                                       |
| com.db.pwcc.dbmobile                   | Deutsche Bank Mobile                               |
| com.defi.wallet                        | Crypto.com   DeFi Wallet                           |
| com.digifinex.app                      | DigiFinex - Buy & Sell Bitcoin, Crypto Trading     |
| com.enjin.mobile.wallet                | Enjin: Bitcoin, Ethereum, Blockchain Crypto Wallet |
| com.etoro.openbook                     | eToro - Smart Crypto Trading Made Easy             |
| com.etoro.wallet                       | eToro Money  |
| com.fideuram.alfabetobanking           | Alfabeto Banking                                   |
| com.fidor.fsw                          | Fidor Smart Banking                                |
| com.fineco.it                          | Fineco   |
| com.firstdirect.bankingonthego         | first direct                                       |
| com.gemini.android.app                 | Gemini: Buy Bitcoin Instantly                      |
| com.getpenta.app                       | Penta – Business Banking App                       |
| com.grppl.android.shell.BOS            | Bank of Scotland Mobile Banking: secure on the go  |
| com.grppl.android.shell.CMBLloydsTSB73 | Lloyds Bank Mobile Banking: by your side           |
| com.grppl.android.shell.halifax        | Halifax: the banking app that gives you extra      |
| com.hanseaticbank.banking              | Hanseatic Bank Mobile                              |
| com.hittechsexpertlimited.hitbtc       | HitBTC – Bitcoin Trading and Crypto Exchange       |
| com.ie.capitalone.uk                   | Capital One UK                                     |

| <b>Package name</b>                 | <b>Application name</b>                          |
|-------------------------------------|--|
| com.ing.mobile                      | ING Bankieren                                    |
| com.kontist                         | Kontist Tax Service                              |
| com.kraken.invest.app               | Kraken - Buy Bitcoin & Crypto                    |
| com.kraken.trade                    | Pro: Advanced Bitcoin & Crypto Trading           |
| com.krakenfutures                   | Kraken Futures: Bitcoin & Crypto Futures Trading |
| com.kubi.kucoin                     | KuCoin: Bitcoin Exchange & Crypto Wallet         |
| com.latuabancaperandroid            | Intesa Sanpaolo Mobile                           |
| com.latuabancaperandroid.pg         | Intesa Sanpaolo Business                         |
| com.liberty.jaxx                    | Jaxx Liberty: Blockchain Wallet                  |
| com.lumiwallet.android              | Lumi Crypto and Bitcoin Wallet                   |
| com.lynxspa.bancopopolare           | YouApp   |
| com.mediolanum.android.fullbanca    | Mediolanum                                       |
| com.mercuryo.app                    | Mercuryo Bitcoin Cryptowallet                    |
| com.mycelium.wallet                 | Mycelium Bitcoin Wallet                          |
| com.ocito.cdn.activity.banquesmc    | SMC pour Mobile                                  |
| com.ocito.cdn.activity.creditdunord | Crédit du Nord pour Mobile                       |
| com.okinc.okex.gp                   | OKEx - Bitcoin/Crypto Trading Platform           |
| com.opentecheng.android.webank      | Webank   |
| com.orangebank.android              | Orange Bank                                      |
| com.paxful.wallet                   | Paxful Bitcoin Wallet                            |
| com.paysend.app                     | Money Transfer App Paysend                       |
| com.phemex.app                      | Phemex: Buy Crypto & Bitcoin                     |
| com.pionex.client                   | Pionex - Crypto Trading Bot                      |
| com.plunien.poloniex                | Poloniex Crypto Exchange                         |
| com.plutus.wallet                   | Abra: Bitcoin, XRP, LTC                          |
| com.rbs.mobile.android.natwest      | NatWest Mobile Banking                           |
| com.rbs.mobile.android.rbs          | Royal Bank of Scotland Mobile Banking            |
| com.rbs.mobile.android.ubn          | Ulster Bank NI Mobile Banking                    |

| <b>Package name</b>                        | <b>Application name</b>                           |
|--|---|
| com.revolut.revolut                        | Revolut - Get more from your money                |
| com.robinhood.android                      | Robinhood - Investment & Trading, Commission-free |
| com.satispay.customer                      | Satispay  |
| com.scrignosa                              | SCRIGNOIdentiTel                                  |
| com.sella.BancaSella                       | Banca Sella                                       |
| com.sisal.sisalpay                         | Mooney App: pagamenti digitali                    |
| com.squareup.cash                          | Cash App  |
| com.starfinanz.smob.android.bwmobilbanking | BW-Mobilbanking mit Smartphone und Tablet         |
| com.starfinanz.smob.android.sfinanzstatus  | Sparkasse Ihre mobile Filiale                     |
| com.starlingbank.android                   | Starling Bank - Better Mobile Banking             |
| com.stoegerit.outbank.android              | Outbank - 360° Banking                            |
| com.stormgain.mobile                       | StormGain: Bitcoin Wallet & Crypto Exchange App   |
| com.superchain.lbankgoogle                 | LBank - Buy Bitcoin & Crypto                      |
| com.tabtrader.android                      | TabTrader Buy Bitcoin and Ethereum on exchanges   |
| com.targo_prod.bad                         | TARGOBANK Mobile Banking                          |
| com.tescobank.mobile                       | Tesco Bank Mobile Banking                         |
| com.transferwise.android                   | TransferWise Money Transfer                       |
| com.triodos.bankingnl                      | Triodos Bankieren NL                              |
| com.unicredit                              | Mobile Banking UniCredit                          |
| com.uphold.wallet                          | Uphold - Trade, Invest, Send Money For Zero Fees  |
| com.vipera.chebanca                        | CheBanca!   |
| com.virginmoney.uk.mobile.android          | Virgin Money Mobile Banking                       |
| com.wallet.crypto.trustapp                 | Trust: Crypto & Bitcoin Wallet                    |
| com.youhodler.youhodler                    | YouHodler - Crypto and Bitcoin Wallet             |
| com.zengo.wallet                           | ZenGo Crypto & Bitcoin Wallet: Buy, Earn & Trade  |
| de.bbbank.banking.privat                   | BBBank-Banking classic                            |
| de.bs.ibanking                             | OLB Banking                                       |
| de.comdirect.app                           | comdirect   |

| <b>Package name</b>                            | <b>Application name</b>                          |
|--|--|
| de.commerzbanking.mobil                        | Commerzbank Banking - The app at your side       |
| de.fiducia.smartphone.android.banking.vr       | VR Banking Classic                               |
| de.fiduciagad.banking.vr                       | VR Banking - einfach sicher                      |
| de.ingdiba.bankingapp                          | ING Banking to go                                |
| de.number26.android                            | N26 — The Mobile Bank                            |
| de.postbank.bestsign                           | Postbank BestSign                                |
| de.postbank.finanzassistent                    | Postbank Finanzassistent                         |
| de.psd.banking.app                             | PSD Banking                                      |
| de.psd.banking.privat                          | PSD Banking Classic                              |
| de.santander.presentation                      | Santander Banking                                |
| de.schildbach.wallet                           | Bitcoin Wallet                                   |
| de.sdvz.ihb.mobile.secureapp.sparda.produktion | SpardaSecureApp                                  |
| de.sparda.banking.privat                       | SpardaBanking+                                   |
| de.spardab.banking.privat                      | Sparda Berlin                                    |
| eth.org.freewallet.app                         | Ethereum Wallet. Buy & Exchange ETH — Freewallet |
| eu.qonto.qonto                                 | Qonto • Easy Business Banking                    |
| eu.unicreditgroup.hvbapptan                    | HVB Mobile Banking                               |
| exodusmovement.exodus                          | Exodus: Crypto Bitcoin Wallet                    |
| fr.bnpp.digitalbanking                         | Hello bank! par BNP Paribas                      |
| fr.creditagricole.androidapp                   | Ma Banque  |
| fr.hsbc.hsbcfrance                             | HSBC France                                      |
| fr.lcl.android.customerarea                    | Mes Comptes - LCL                                |
| fr.mafrenchbank                                | Ma French Bank                                   |
| io.atomicwallet                                | Bitcoin Wallet & Ethereum Ripple ZIL DOT         |
| io.bluewallet.bluewallet                       | BlueWallet Bitcoin Wallet                        |
| io.cex.app.prod                                | CEX.IO Cryptocurrency Exchange                   |
| io.metamask                                    | MetaMask - Buy, Send and Swap Crypto             |
| io.safepal.wallet                              | SafePal-Crypto wallet BTC NFTs                   |

| <b>Package name</b>                   | <b>Application name</b>                          |
|---------------------------------------|--|
| it.bcc.iccrea.mycartabcc              | myCartaBCC                                       |
| it.bnl.apps.banking                   | BNL  |
| it.bnl.apps.banking.privatebnl        | My Private Banking                               |
| it.bper.mobile.mymoney                | Smart My Money                                   |
| it.caitalia.apphub                    | Crédit Agricole Italia                           |
| it.carige                             | Carige Mobile                                    |
| it.cedacri.hb2.bpbari                 | Mi@  |
| it.cedacri.hb3.desio.brianza          | D-Mobile   |
| it.copergmeps.rt.pf.android.sp.bmps   | Banca MPS  |
| it.creval.bancaperta                  | Bancaperta                                       |
| it.gruppobper.ams.android.bper        | Smart Mobile Banking                             |
| it.gruppobper.smartbpercard           | Smart BPER Card                                  |
| it.gruppocariparma.nowbanking         | Nowbanking                                       |
| it.hype.app                           | Hype   |
| it.icbpi.mobile                       | Nexi Pay   |
| it.ingdirect.app                      | ING Italia                                       |
| it.nogood.container                   | UBI Banca  |
| it.phoenixspa.inbank                  | Inbank   |
| it.popso.SCRIGNOapp                   | SCRIGNOapp                                       |
| it.relaxbanking                       | RelaxBanking Mobile                              |
| mobi.societegenerale.mobile.lappli    | L'Appli Société Générale                         |
| mobi.societegenerale.mobile.lapplipro | L'Appli Pro Société Générale                     |
| mw.org.freewallet.app                 | Bitcoin & Crypto Blockchain Wallet: Freewallet   |
| net.bitstamp.app                      | Bitstamp – Buy & Sell Bitcoin at Crypto Exchange |
| net.bnpparibas.mescomptes             | Mes Comptes BNP Paribas                          |
| net.safemoon.androidwallet            | SafeMoon   |
| nl.asnbank.asnbankieren               | ASN Mobiel Bankieren                             |
| nl.rabomobiel                         | Rabo Bankieren                                   |

| <b>Package name</b>                             | <b>Application name</b>                            |
|---|--|
| nl.regiobank.regiobankieren                     | RegioBank - Mobiel Bankieren                       |
| nl.snsbank.snsbankieren                         | SNS Mobiel Bankieren                               |
| one.tomorrow.app                                | Tomorrow: Mobile Banking                           |
| org.electrum.electrum                           | Electrum Bitcoin Wallet                            |
| org.toshi                                       | Coinbase Wallet — Crypto Wallet & DApp Browser     |
| piuk.blockchain.android                         | Blockchain Wallet. Bitcoin, Bitcoin Cash, Ethereum |
| posteitaliane.posteapp.appbpol                  | BancoPosta   |
| se.bankgirot.swish                              | Swish payments                                     |
| uk.co.hsbc.hsbcukmobilebanking                  | HSBC UK Mobile Banking                             |
| uk.co.mbna.cardservices.android                 | MBNA - Card Services App                           |
| uk.co.metrobankonline.mobile.android.production | Metro Bank   |
| uk.co.santander.santanderUK                     | Santander Mobile Banking                           |
| uk.co.tsb.newmobilebank                         | TSB Mobile Banking                                 |

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Source: <https://www.threatfabric.com/blogs/the-attack-of-the-droppers.html>