Apps on Google Play Tainted with Cerberus Banker Malware

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Anti-Malware Research
6 min read

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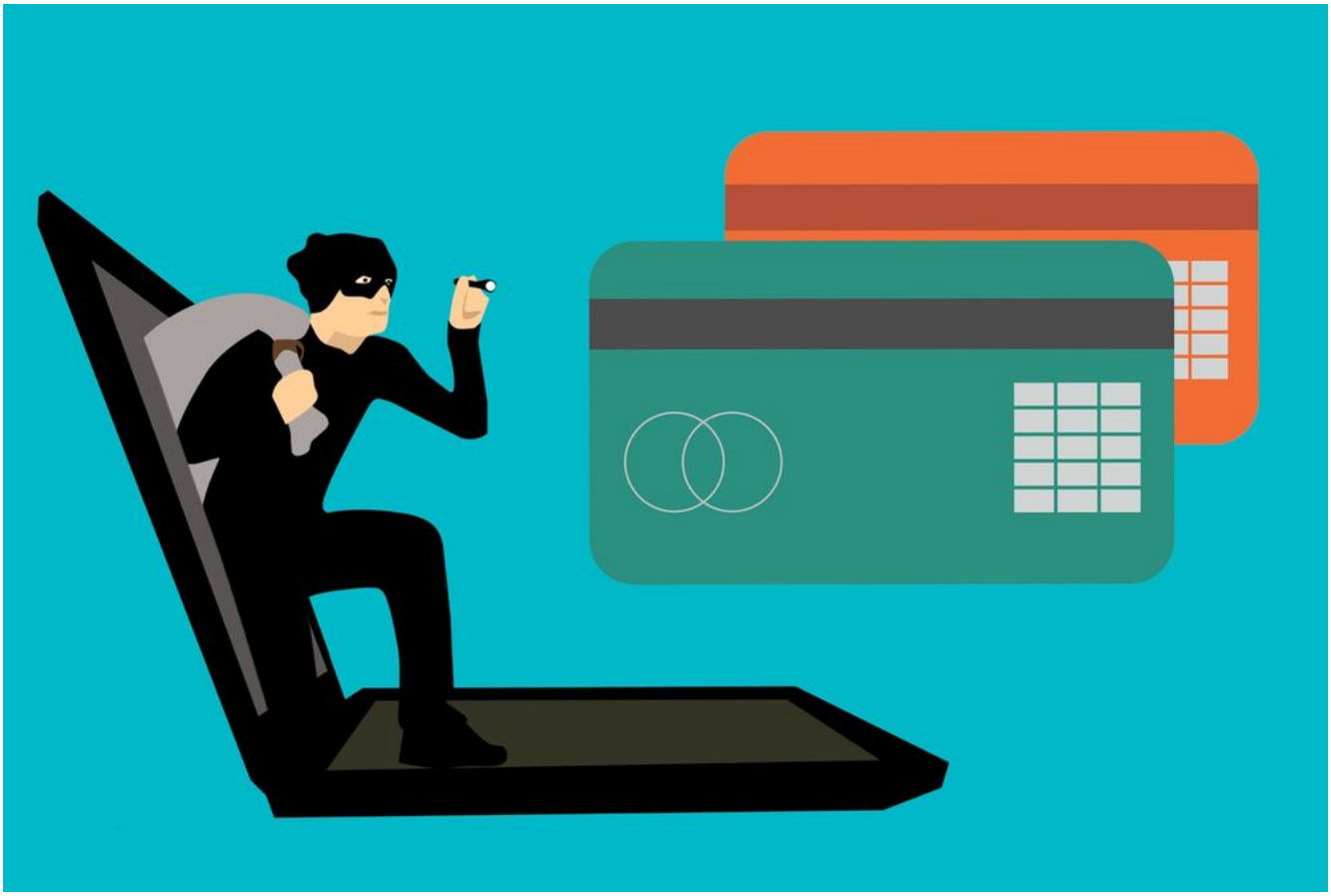
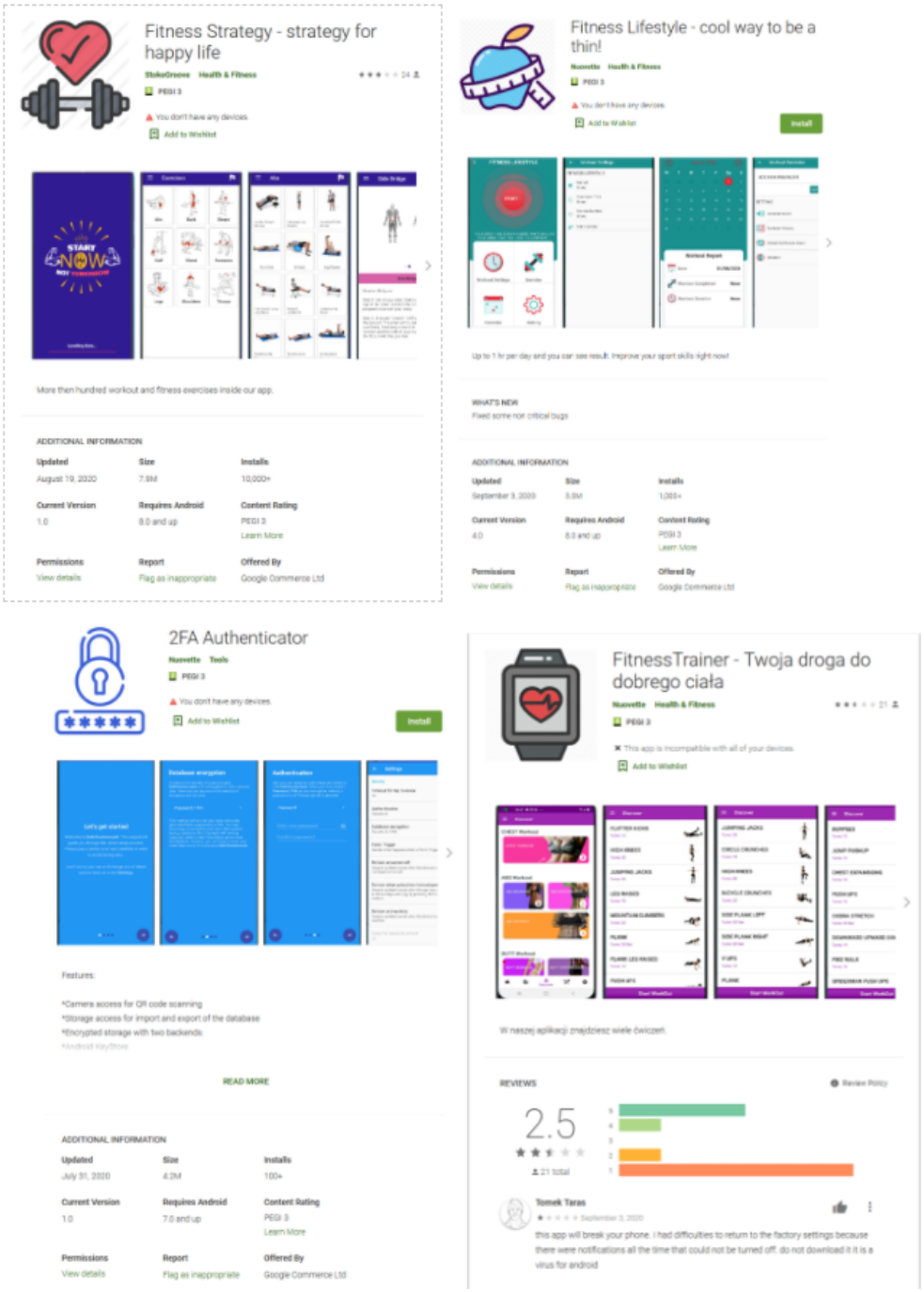


The official Android app market has traditionally been regarded as a safe place to install applications from. Every once in a while, remarkably malicious apps slip right through and start wreaking havoc before they're spotted and retired.

Today's blog post focuses on several utility apps that look innocent at a glance, but whose real purpose is to download and enable various banker Trojans on the device and lend hackers a hand into emptying victims' accounts.

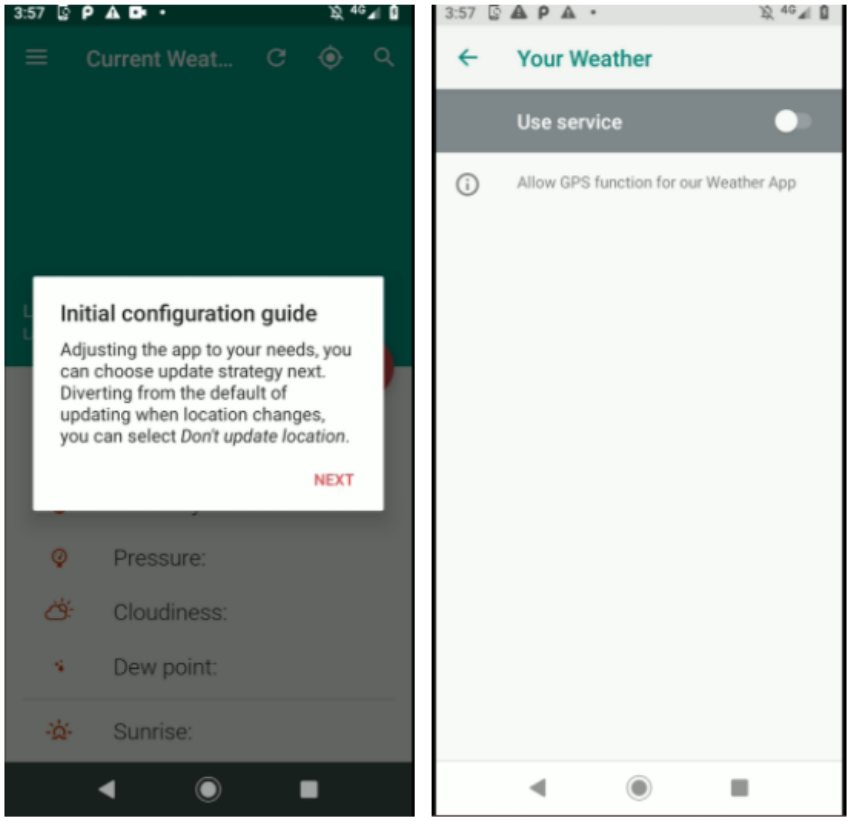
The apps in question were spotted on Google Play by some of our machine learning algorithms. The apps belong to different categories, but most of them are marketed as health and sports companions. Their presence on Google Play dates back to February this year, but the most recent ones were published just days ago. At the moment of writing this report, several samples are still available on **third-party stores**. The apps vary in popularity, with the more popular ones having been downloaded more than 10,000 times.

Bitdefender detects this threat as *Android.Trojan.Downloader.UT*.



Behavior

To some extent, these applications ship with the advertised functionality. However, under the hood, they communicate with a server and, if some prerequisites are met, the server decides whether to allow the app to download a malicious APK or not. If the APK is made available, the application will try to lure the user into granting it Accessibility rights. If the service is enabled, the app will install the payload and attempt to enable the payload's accessibility service through it.

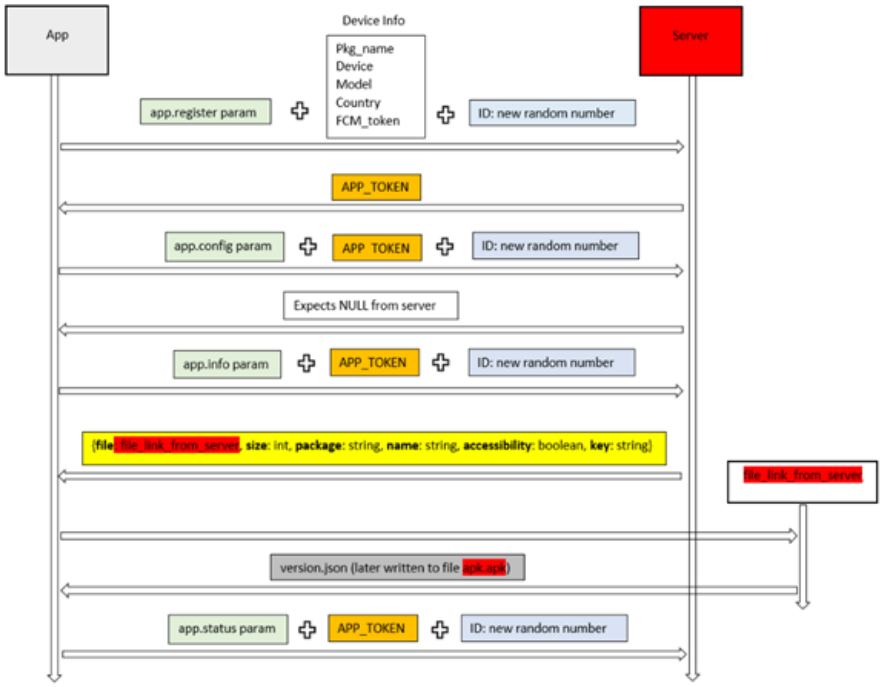


The apps have a specific way of communicating with the server. Information about the device (such as the country, the package name, the build version release, and the build model) is sent to the server as an app registration request, and an app token is sent back. This token will be used in all subsequent requests to the server. Depending on this, the app will receive from the server a link to the APK file to be downloaded later.

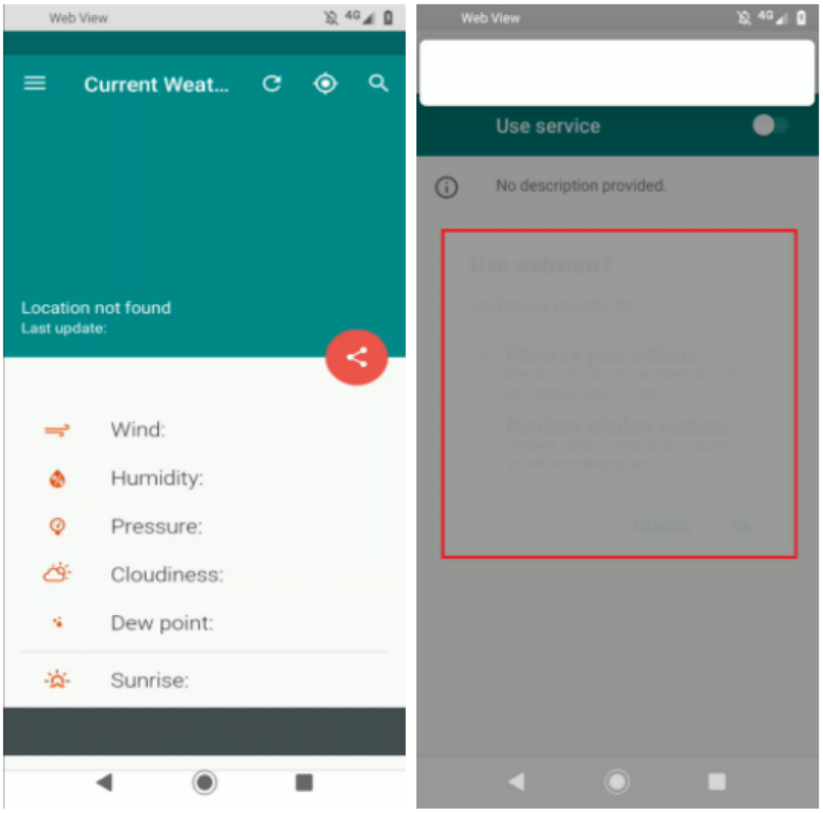
```
{"id": 1234567, "method": "app.register", "params": {"package": "com.yourweather.app", "device": "Android",
"model": "Samsung Galaxy Nexus", "country": "en-US"}, "jsonrpc": "2.0"}
```

Initial request mock example

The same CnC provides different APKs at different times, possibly due to different configurations being sent to the server. We conclude that the malware authors might have a selection process to determine what users should get the banker or when they should get it, making the downloaded APKs harder to trace and even possibly target it toward specific profiles.



The initial apps have the sole purpose of trying to download the payload app. After the payload app has been installed, the original one will enable accessibility services for the second app. Interestingly, once the downloaded APK has been installed and its accessibility service is enabled through the original app's accessibility control, the latter will disable its own accessibility abilities to avoid raising any suspicions and will continue to work as described in the application's description on Play Store.



A new app can be seen in the background of the initially installed app. It is named Web View, a generic name set not to raise suspicions. This happens for a split second while the downloader uses the accessibility service to enable the payload.

At this point, the first app is no longer of interest, and the second app takes charge of the device's infestation instead. The droppers continue to offer the neither good nor terrible features advertised on Google Play. It will keep listening for certain intents (e.g., BOOT_COMPLETED) and can even hide their launcher if all the prerequisites are met.

The downloaded apps that we interacted with are various banking malware applications in the Cerberus family. Since they had already received accessibility permissions, they proceed to give themselves all the needed permissions, set themselves as device admins, and even as default SMS apps. From there on, the payload application has full control over the device.

Versions

The apps can be divided into two categories, despite the main dropper functionality being very similar.

V1: com.radiofun.app and me.maxdev.popularmoviesapp

The first version of the malware, which is less obfuscated and mainly uses Base64 for encryption. The early versions of these apps offered a simpler communication interface and even lacked the second version's registration process. It dates back to February 2020.

V2: the others

The second version of the malware. It uses a different obfuscation technique and has made its first appearance in the wild in June 2020. It is stripped of most debugging information present in version 1. Communication with the server is more advanced, allowing for better control of the payload installation.

Origin

Presumably, in order to hinder investigations, the malware authors publish the malicious apps through several different developer accounts.

Developername	EmailAddress	Last Update
Nouvette	mcmillianschmid80@gmail.com	3 September 2020
Piastos	pennishavondaphamyo51@gmail.com	23 June 2020
Progster	nellafajardolysl85@gmail.com	3 July 2020
imirova91	annavladimirova91@gmail.com	4 July 2020
StokeGroove	hammonslarge3@gmail.com	19 August 2020
VolkavStune	jessicapeter70@gmail.com	27 February 2020

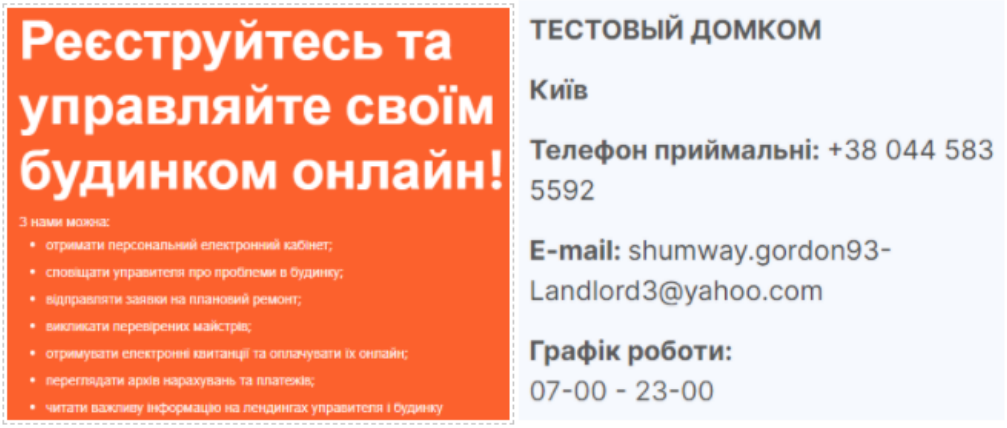
A vague pattern can be noted among the email addresses, which consist of a name, a surname and a number registered on Gmail.

C&C	IP Resolved	Status
vipyoga[.]today	95.142.40.68	UP
weatherclub[.]club	185.177.93.242	UP
downdating[.]club	185.177.93.32	UP
positivefitness[.]club	185.177.93.72	UP
loversfinder[.]xyz	198.54.125.121	UP
yoga4u[.]xyz	185.177.93.120	TIMEOUT
groovefitness[.]xyz	185.177.92.213	UP

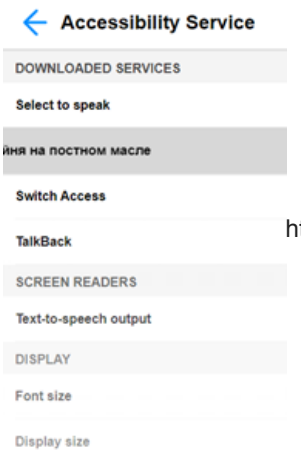
fitnessstrategy[.]xyz	185.177.93.44	UP
safeyourdata[.]xyz	185.177.93.145	UP
sport4ever[.]club	185.177.93.105	UP
2fapass[.]club	185.177.93.111	UP
androidradio[.]life	45.142.212.216	UP

While most of the command and control servers don't have any meaningful webpages available, one of them hosts a work-in-progress site for a home management provider from Kiev, Ukraine.

`https://positivefitness[.]club/landing/news/5f2463e1bbc5c5e5d`



The official site of the provider can be found at https://djek.org/.
Another server, loversfinder[.]xyz, hosts a page with the infamous Cerberus mobile user interface, tweaked a bit for Russian speakers.



https://loversfinder[.]xyz/accessibility.html

Given these pages, as well as some Russian language strings found in the oldest versions of the malware family and the fact that the only developer whose name matches the email address is clearly Slavic (Vladimirova), we can make an educated guess that the authors are probably of Eastern Slavic origin.

Telemetry

The droppers are most popular in Europe, particularly in Spain, but our telemetry shows that they are also spread across the US and Australia as well.

Appendix – Indicators of Compromise

MD5	SHA256
95df249db6c7b745aa42ab362d44bab7	91ac84bfa47d2ee5addb2eb7047f2f21fd7712c4d99fd224c6c1cb4f6e6a2ffa
477b37aa15058e1ac8167de3260a2400	446d44b2e2bdd063aed7c142da54d0bf1e1f145ddc5cb4f64b1de8dbb9b5a117
de0383f0c7a422f5ab24a1ec1ec65aa1	52f5c117e3fff7be71afa0a4c5e53b24c05434599aaad885fbc2d7d7658e69fa
53b5f39fb9e885767cf05270f6ed4286	6243ed1d4f2712be2e02edfb6411e8dc86ebe2c683e9f64462f7d23354a0e1ba
1f1458bf12f2f983a1517c06def840ac	446348a93ad38420f75bbd3ef4fff89ac55593ba8e9015e18df82645ad6fe424
c4e05d945aee3817f23ef52b9de065a7	9c81fc435bdeadb43e0085f2a49ffd648dfd4e0a29295e07adfd72810c326b4c
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cbf908c23201161e25dc93361cd59688	561b0057cbd91dec480999733b12b0d8bf7b173997384147fa7c6f2e830d3b8f
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51093ded1b425f46669f51a84e0664c1	6366d374a7a189908cb22ce7ab53f7a4d795334ddb7aaf20c45aa64889782e98
a6129e463e85d0ac0ef7764d7f8ec887	121b3779a0bd540eeae5897eac4dd94b0d8fa63cb8cc3023d5a8e914ac827b51
3c5b3611cba54e8898f974ccdda08924	0b04223581f96316df150bff2de7f428964f9050c6ffc731763d6aec78519f2d
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fe7a15b4cd8a472c9b146fa9797dd4ec	9a71b14abfbc6ff4d8768dbdfcc3a573cfd107151d3d42f6d6cf11b7d7c699ef
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5e355270a4b984bd12e62f1681809169	a830620a6942a916a7cd93409445dc857d239d9803bffd5a489e0d1057c1f52f

Payloads

nohiv.bzi.jrp
pliqlqpfihoul.joyqtbisgqdaclndxsu.igrl

Certificates

0b10b6815d41a238f1738c236c861cdb9f51adf3
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TAGS

anti-malware research

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tware Engineering. When I'm not