

# Appendix: Underground Services, Tools, and Offers

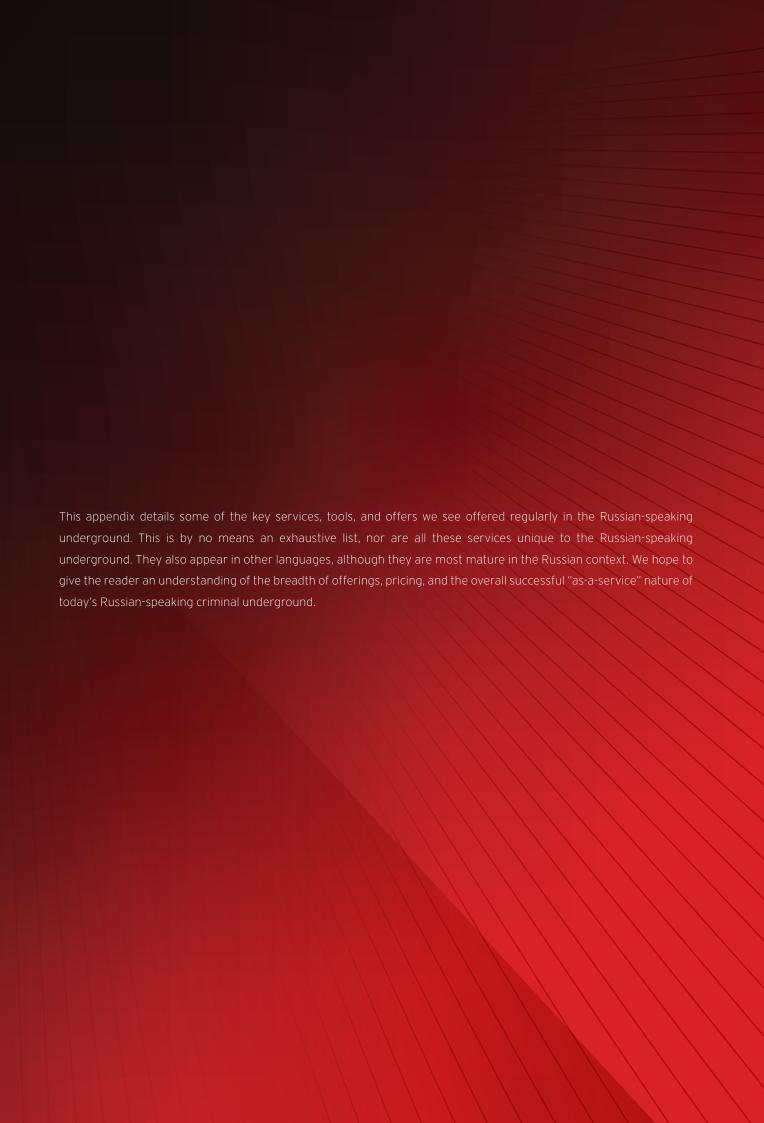
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# Services (provision of methods)

# Telecom and mobile platforms monetization

Telecom platforms connect mobile devices and a variety of equipment, including smart watches, smart meters, and other smart devices. Mobile devices are often more limited in their capability to be integrated into secure environments. This can create blind spots in cyber-kill chains within many attack scenarios. We see many services in the criminal underground supporting this ecosystem.

#### SIM cards

SIM cards are a critical part of various criminal business processes. They can be used to register and confirm identities, as two-factor authentication (2FA) for account registration, and confirmation of financial transactions. Accessing accounts for government and financial services that are linked to local phone numbers will trigger less alerts compared to accounts registered with numbers from other regions. This creates a demand for SIM cards in specific geolocations. One example is an advertisement in a Telegram channel, with part of the message written in Russian and mixed with Ukrainian, shown in Figure 1.



Figure 1. Availability of SIM cards available for purchase from the countries shown by flags at the bottom

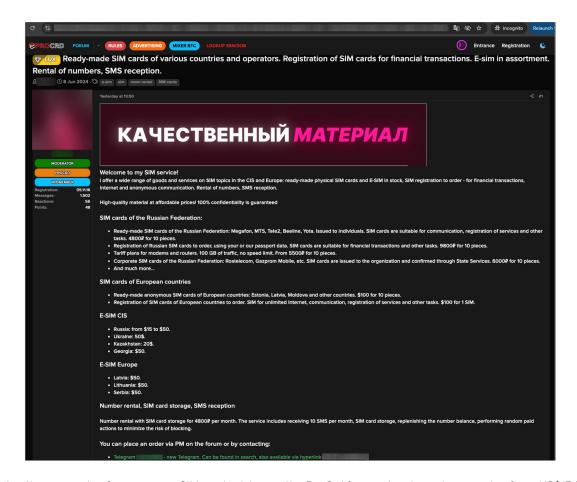


Figure 2. Another example of anonymous SIM card pricing on the ProCrd forum showing prices ranging from US\$15 to US\$50 depending on the country

# SMS messaging

SMS messaging services can be used as part of phishing campaigns (also known as smishing), scam operations, and a variety of extortion schemes.

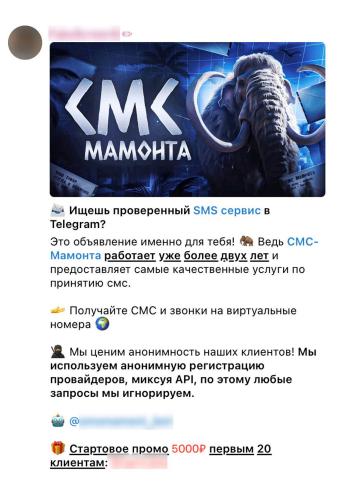


Figure 3. A customized SMS messaging service for scam operations advertised in Telegram

The figure above advertises a service called "SMS for Mammoths" which has been providing services for SMS and phone calls landing for over two years. The service claims to use anonymous registration, mixing API queries, and ignoring abuse and law enforcement requests.

#### Phone flooding

Phone flooding is the practice of generating large volumes of calls to a target number. It is a form of denial of service and leveraged in several scenarios – for example, pressuring a victim (e.g. virtual kidnapping attacks) or buying time to avoid the detection or mitigation of other ongoing attacks. It can also be used to overload business hotlines while there is an ongoing money heist to allow time for fund transfers before the company is alerted.

Flooding is not always done by leveraging random lines to make calls and overload the target's line – there are also more creative approaches to reach these goals. For example, victim's phone number can be published on a variety of message boards and associated with goods for sale at a very good price, leading to real people calling at scale and overloading the line.

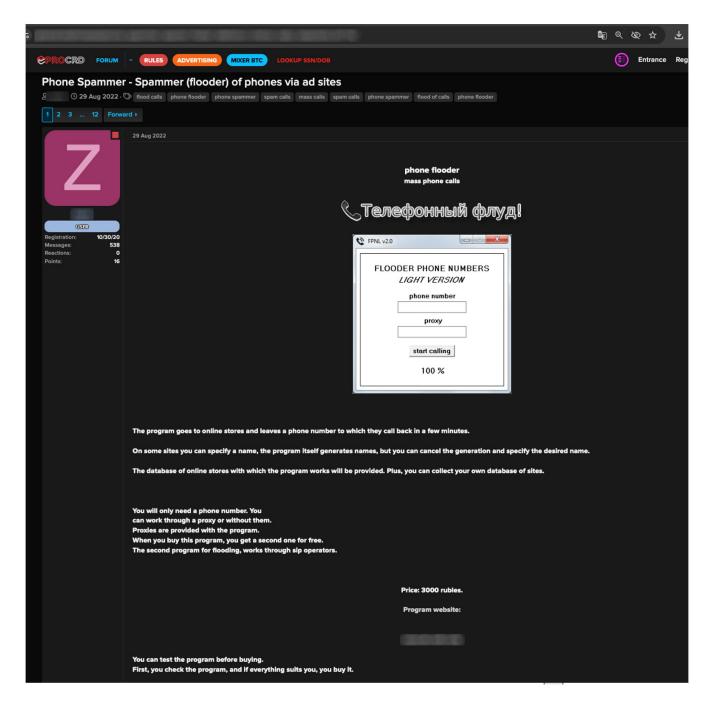


Figure 4. Phone flooding service for approximately US\$30

# Temporary SMS landing services

SMS landing services are widely leveraged in creating accounts for different social media, email, e-commerce, and messaging platforms at scale. They allow a user to receive an identity verification SMS message during the account setup process. Normally, the customer of such a service can choose the geographical region and the service needed. There are automation platforms like Telegram bots or APIs that allow the scaling of account creation procedures.

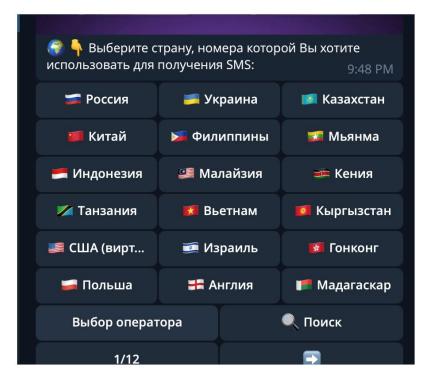


Figure 5. Temporary SMS landing service showing the countries they can provide



Figure 6. Temporary SMS landing service showing the type of SMS verification they are currently working with (as online services actively look to block such SMS services)

#### 2FA and SMS interception

SMS interception services can take over valuable digital assets and collect sensitive information about victims by intercepting SMS enroute to a target. The implementation of this service can require advanced technical skills and possession of access to a telecom environment. Interception is often used to take over access to financial accounts or collect information, which can be used as extortion leverage.

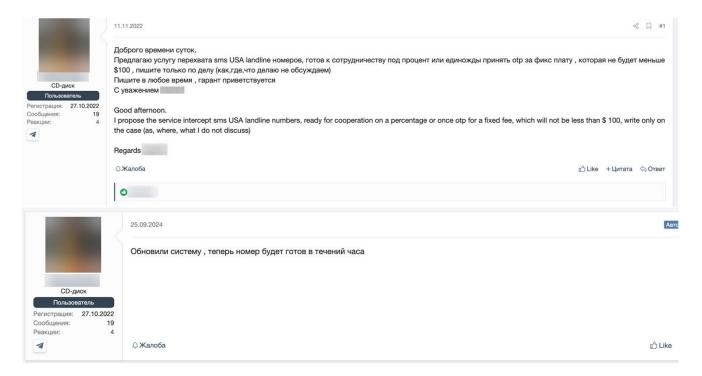


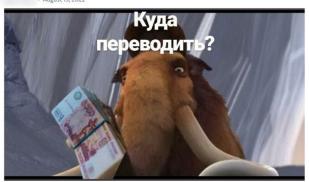
Figure 7. SMS interception service offered in the USA for a minimum of US\$100 per SMS

#### iPhone scams

Among iPhone scams, it is worth highlighting scenarios where attackers use social engineering to trick a victim into connecting to an attacker-controlled iCloud account. While this is not the only scam targeting iPhone users, it is currently one of the most popular on the market. Once in place, the attacker intercepts access to the victim's iPhone and uses this access as a form of extortion. An example of a detailed manual for this is shown in Figure 8. This manual is a good example to use in awareness programs for educating people about the risks of mobile devices.

#### **Scamming iPhone Owners**

. August 19 203



Hello, in this manual I will tell you about a current method of scamming iPhone owners. The topic is very profitable, enjoy reading.

- 1) Go to the website icloud.com and register an account.
  - 2) We buy a female VK account (it costs about 20 rubles on websites).
- 3) Log into your VK account and spam groups such as: cars, apartments, Apple repairs, women's forums, and in general any groups that come to mind.
  - 4) Write the following message:
  - Urgently need a person who has an iPhone, iPad or MacBook, really need it for help. I'll pay 500-1000 rubles for 5 minutes of work.
  - ( This text was an example, I advise you to prepare your own text )
- 5) Then 30-50-100 people will start writing to you, you won't even have time to answer everyone.  $\,$ 
  - 6) Write the following message

#### Example:

I AM A NAIVE GIRL, I WENT TO VACATION IN TURKEY AND BROKEN MY IPHONE ON ARRIVAL, ALL THE PHOTOS REMAINED ON IT, THERE IS NO POSSIBILITY TO REPAIR THEM, BUT I NEED THE PHOTOS. PLEASE HELP ME GET THEM, I WILL PAY 500-1000P.

In 70% of cases, mammoths agree.

- 8) If the mammoth agrees, you give the login and password that you registered in point [1]
  - 9) He logs into the account and writes you something like this:

I went into your account, there are no photos.

At this point, you go back to icloud.com and change your password.

That's it, the mammoth is activated under your iCloud on your iPhone.

Consider that 90% of the work is yours.

10) We are already using SI. And so, purely formally, we say: I don't know how this can be, try rebooting the iPhone.

He reboots and again there is nothing, you turn on the naive fool. And you say:

This will enable the Find My iPhone feature.

- 11) If he turns on the "find iPhone" function, go to the cloud through your personal account and click "lost iPhone", enter the message to display on his screen: Transfer 5000 rubles to number 7\*\*\*\*\*\* \*\*\* or to a Qiwi wallet, there we decide where to transfer, etc.
  - 12) I will say for those who are in the dark and do not understand the essence:

If the iPhone is blocked, or the owner simply does not know the password to the cloud, then the iPhone is like garbage, even if you throw it away, there is no way to remove it, not one service can remove it, that is , it has no choice but to pay you.

13) Even if he doesn't turn on the "find iPhono" function and he suspects something, then you just say: Well, ok, bye, if you need me, write. After a while, he will write to you himself, because you have already changed the password and he will not be able to log out. He has no choice but to write to you. In this case, we also ask for money.

Most people have the "Find iPhone" function enabled initially, so as soon as the mammoth has logged in under your account, go to iCloud and check if this function is enabled. With a good approach to this manual, you can have a pretty good profit.

Figure 8. Example of the iPhone access monetization business model

#### Phone databases

Phone databases are important assets needed in a variety of criminal business processes related to scam, fraud, or extortion. Phone databases for mobile phones are also used in phishing campaigns that leverage SMS messages. An example of an advertisement of such databases with precision up to city level in Ukraine is shown below.

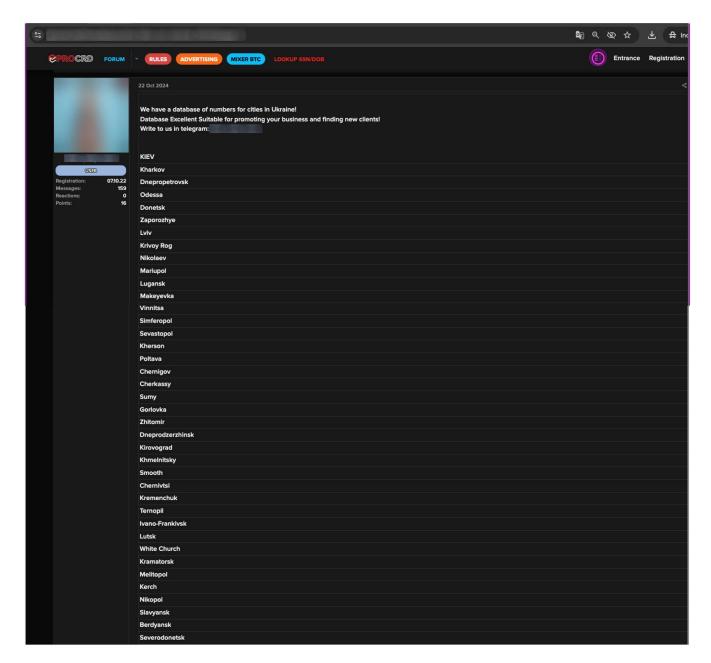


Figure 9. Ukrainian phone database advertisement

# iCloud account unlocking

iCloud account unlocking (i.e., hacking an iCloud account) is advertised on underground forums. Since this service requires advanced skills and techniques, the price of the service is often listed as "on request." Sellers are also secretive about how they accomplish this task (e.g., via phishing, SMS intercept, social engineering). However, many are successful based on their reputation and reviews. When a default price is shown, it is often high, as seen in the example below where the service costs US\$2,000.



Figure 10. Example of an iCloud account unlocking access price

The advertisement below shows the request for iCloud unlocking services, which the author wants done as revenge against another criminal who successfully attacked the phone of the author themselves.



Figure 11. Example for request to compromise accounts and devices using iCloud

An example of a request to access media content stored in iCloud is shown below.

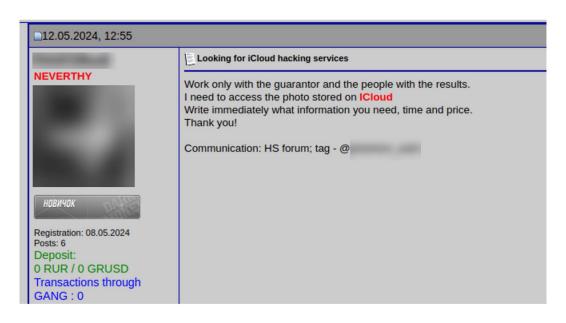


Figure 12. Request to compromise iCloud accounts and extract media content

#### **Other Criminal Services**

#### Mobile botnet rental

Access to a victims' mobile phone is significant in itself, but for criminals, controlling a mobile botnet is an added opportunity to significantly scale criminal business processes. These business processes can leverage the data stored or processed on the phones, such as private photos, credentials, credit cards, seed phrases for crypto wallets, and more. The botnet can also be leveraged as a proxy network or as a part of search engine optimization (SEO), public opinion manipulation campaigns, or business process compromise.<sup>1</sup>

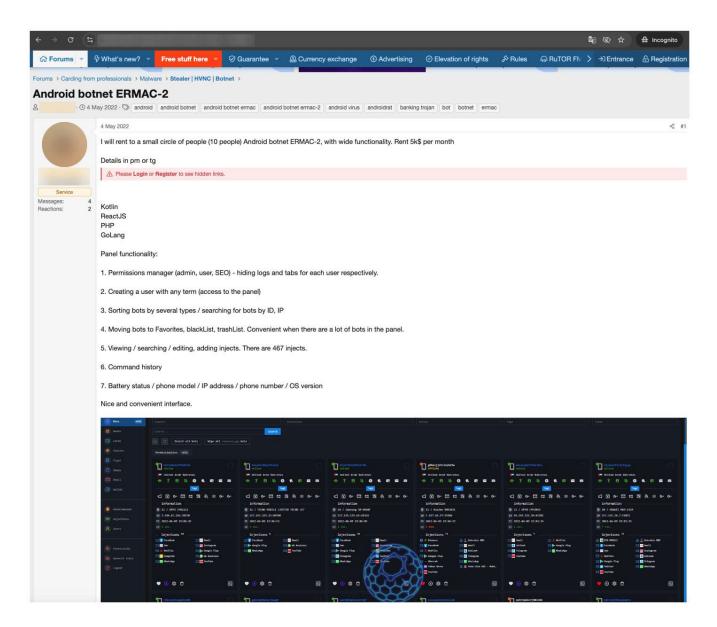


Figure 13. An example of an advertisement for a mobile, Android-based botnet rental for US\$5,000 per month

#### Underground criminal directory services

The criminal underground has its own version of the criminal directory services, specifically indexing and categorizing resources, services, and tools. These directories help attackers find appropriate assets to implement their criminal business processes.

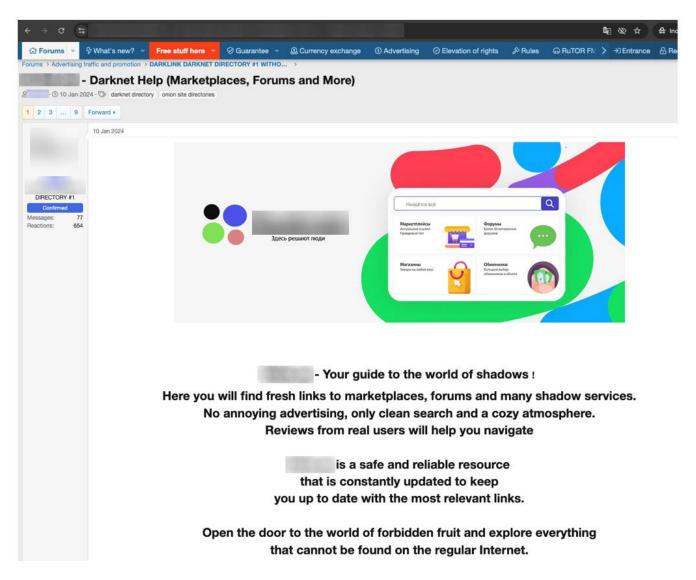


Figure 14. Advertisement of a search portal for criminal services

#### **Gaming accounts**

Gaming accounts are assets that have significant volume in the underground and significant value, especially for younger generations. The demand is fulfilled by accounts collected using information stealers or through phishing campaigns. The prices of accounts vary, normally depending on the resources (such as the number of hours played, features and items unlocked, etc.) invested into the accounts. Compromised accounts can be used by other gamers for a range of purposes, transfer of in-game items for example, or simply extorting the user to restore their account. At the higher level, eSports players are susceptible to specific attack scenarios, which we have researched in the past.<sup>2</sup>

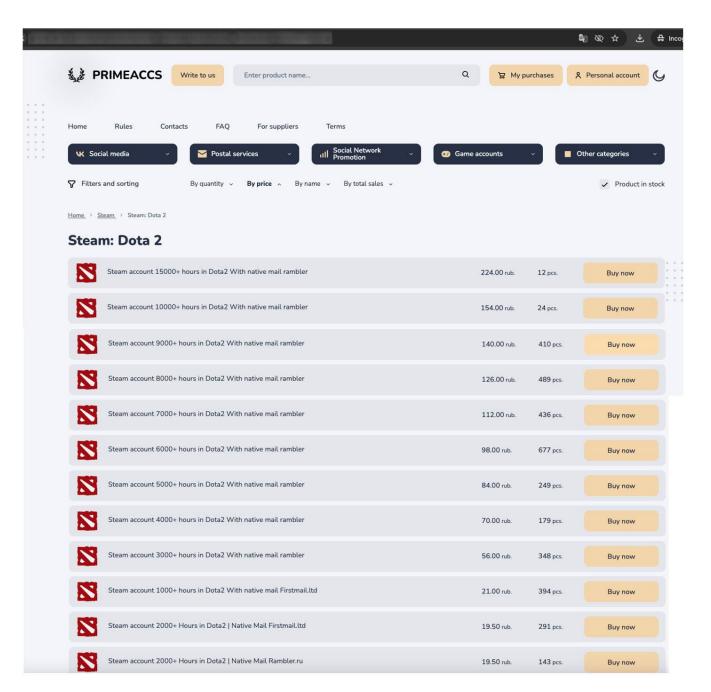


Figure 15. Example of gaming account pricing for Dota 2 (Defense of the Ancients game), with prices based on number of hours invested

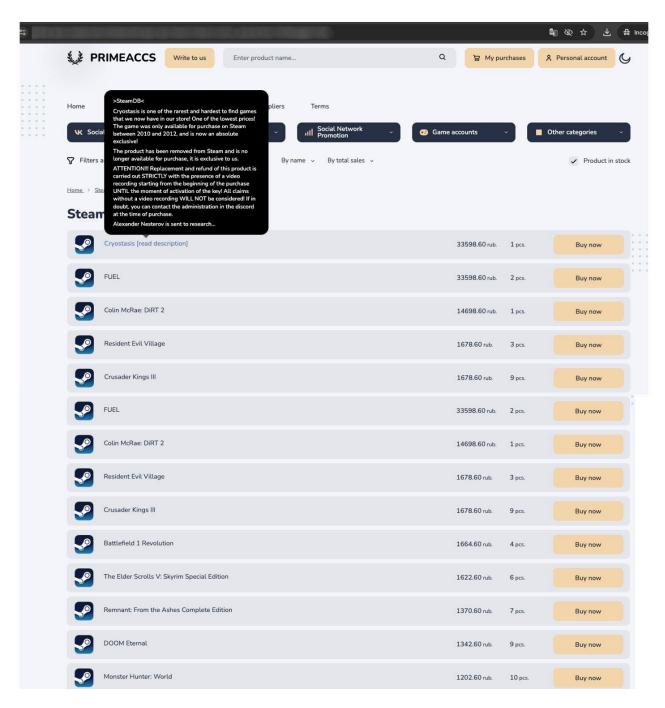


Figure 16. Example of the prices for popular game accounts

#### Access-as-a-service

Access-as-a-service is foundational to many criminal business processes. Ransomware actors, national state aligned groups, and industrial espionage-oriented groups are all interested in creating shortcuts to acquiring assets inside their targeted infrastructures instead of carrying out initial attacks themselves. Along with the benefits of cost and time, this provides an additional layer of deniability – it mixes TTPs, complicates attacker attribution, and interferes with incident investigation and mitigation. The price of such access depends on the asset's potential. The service can ask for hundreds of thousands of dollars, or revenue shares from further monetization (like ransomware attacks).

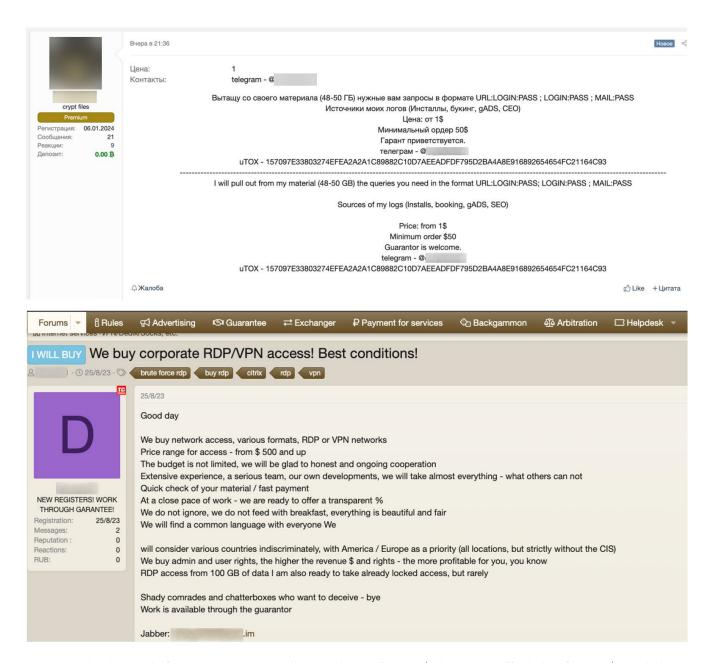


Figure 17. Advertisement of access-as-a-service with price starting from US\$1 (top) vs. an offer to buy from US\$500 (bottom)

#### Malicious software installs

Software installation (usually malicious) on victim machines is a service with high demand and significant offers. The services are often separated into mobile, desktop, and cloud platforms. Figures 18 and 19 show examples of guides and requests to install custom software.

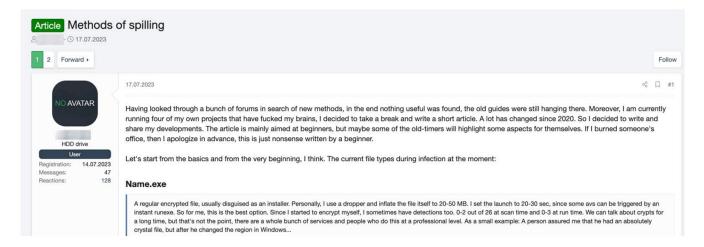


Figure 18. Detailed guide on how to distribute malicious software at scale

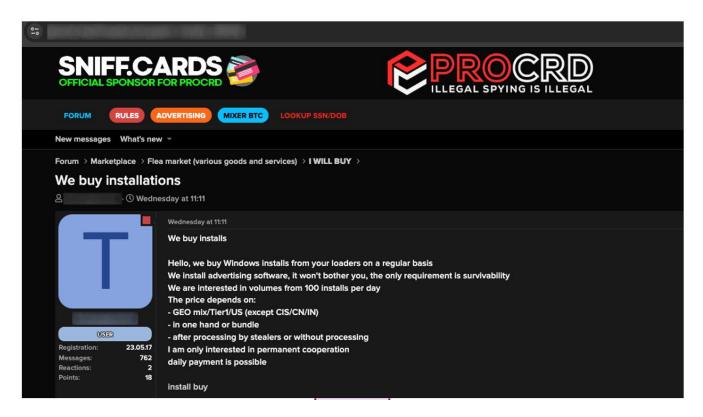


Figure 19. Request to buy installs for the purposes of deploying software that monetizes the victims based on advertisements

### Al offerings

All assets, such as ChatGPT accounts or services, that leverage All technologies to create new criminal business processes or scale existing ones are widely available on the underground. Trend Micro has covered this area in-depth in past research.<sup>3,4,5</sup>

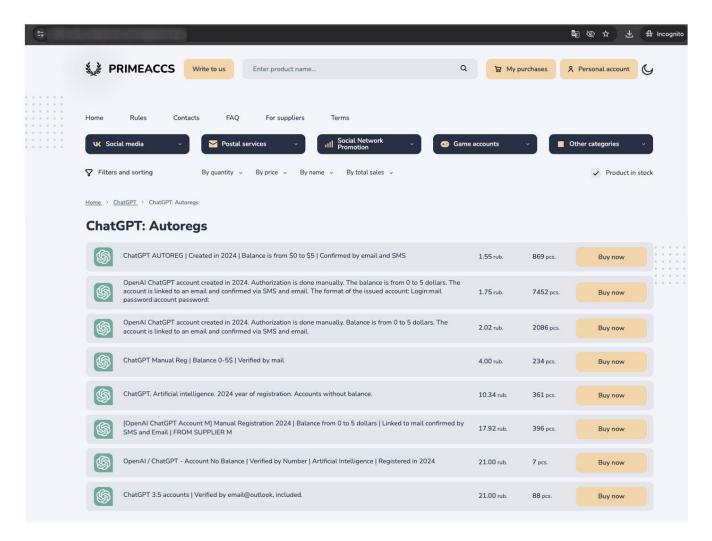


Figure 20. Accounts for ChatGPT price in Russian ruble (as little as US\$0.02)

# **Automation and scaling**

Automation and scaling are critical for many criminal business processes, such as phishing campaigns, automation of assets sale and verification, and bypassing antifraud systems on financial and e-commerce platforms. Related service offerings are widely available on Telegram and forums, and many automations are done using Telegram bots.

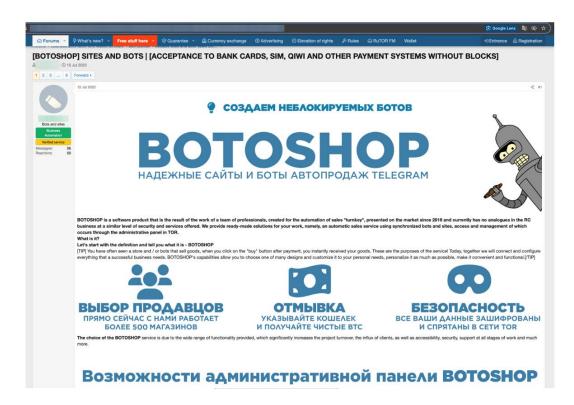
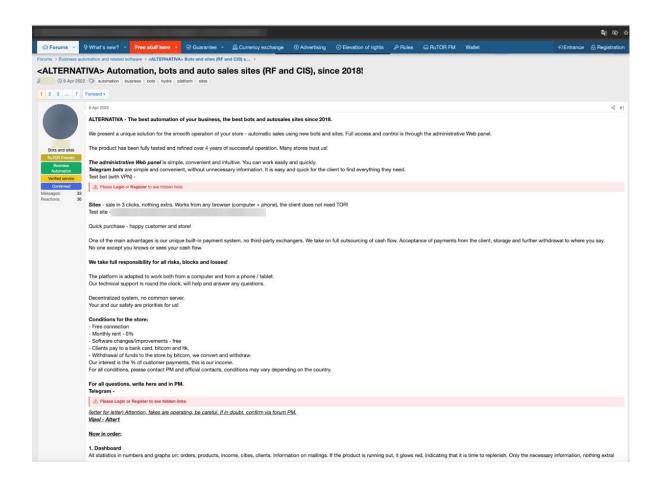
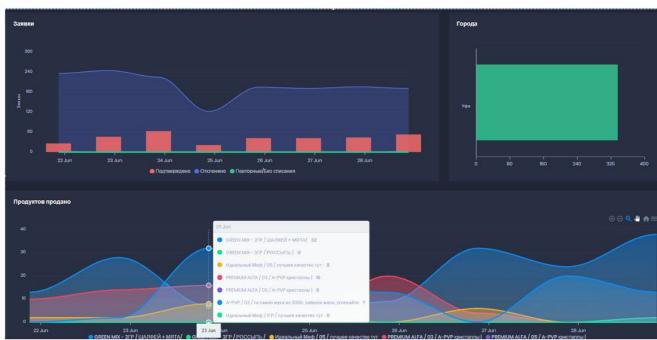


Figure 21. Advertisement of bot automation software with a focus on accepting payments for criminal services via a wide variety of payment systems



1. Dashboard
All statistics in numbers and graphs on: orders, products, income, cities, clients. Information on mailings. If the product is running out, it glows red, indicating that it is time to replenish. Only the necessary information, nothing extral





#### 5. Products

Possibility to add products one by one or as a list, 10-20-30 pieces at once. It is convenient and saves your time. With one click on the product you can immediately see the available warehouse for

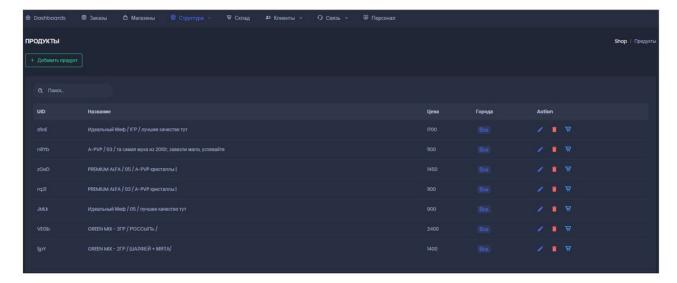


Figure 22. Detailed automation software advertisement to run an entire criminal shop with panel examples

#### Financial services

Criminal underground users prioritize monetization methods. Financial services and tools are important building blocks for many criminal business processes and are widely present on underground discussions.

#### Identity verification kits and templates for KYC Bypass

Know Your Customer (KYC) is a critical process that was first employed by financial organizations and then adopted by other industries. It is used to verify the identity of clients, along with their financial knowledge, risks, and investment profiles. It often involves some form of real-time video identification or other biometrics.

Identity verification kits provide technologies to bypass KYC onboarding procedures that are widely used, especially in the financial and government institutions. These kits include support for video – for example, heads which rotate in several directions (used to bypass biometric identification<sup>6</sup>). These kits can also include photos or even automatic tools for generating digital images of IDs (with photos and personal information provided by the customer).

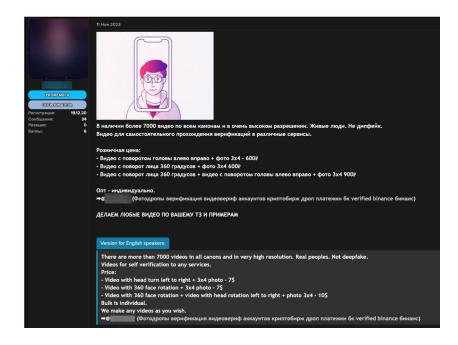


Figure 23. Video templates for generation of a digital identity, with pricing starting from US\$7 per video or US\$10 for full 360-degree movement

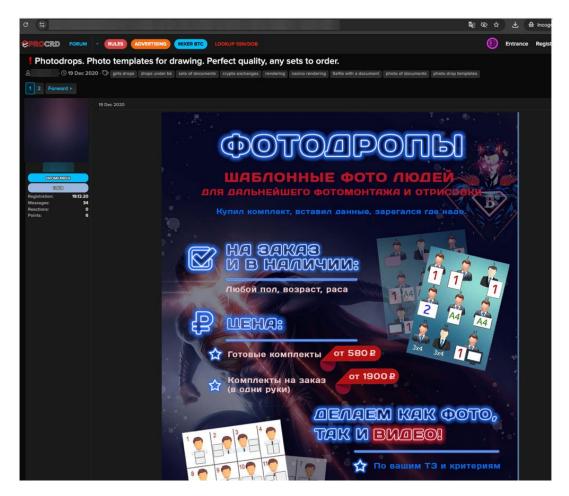


Figure 24. Photo identity verification templates (advertised since 2020)

#### Opening fraudulent accounts in financial institutions

Based on the leaked or generated PII and biometrics, underground actors are capable of opening accounts in financial institutions on behalf of other people or even for identities that never existed. Self-registered accounts enable money laundering and cashout services for a variety of scenarios related to monetization of attacks on e-commerce and financial platforms. The prices vary between tens and hundreds of American dollars.

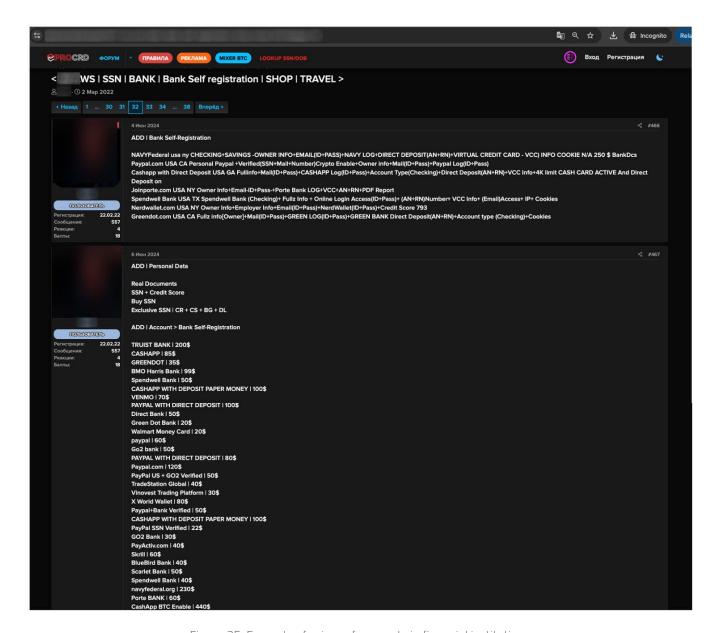


Figure 25. Example of prices of accounts in financial institutions

#### Money laundering and cashout services

Money laundering and cashout services help criminals get past the barrier of using their illegally obtained financial assets with their real identity. It is often related to the final steps of criminal business processes.

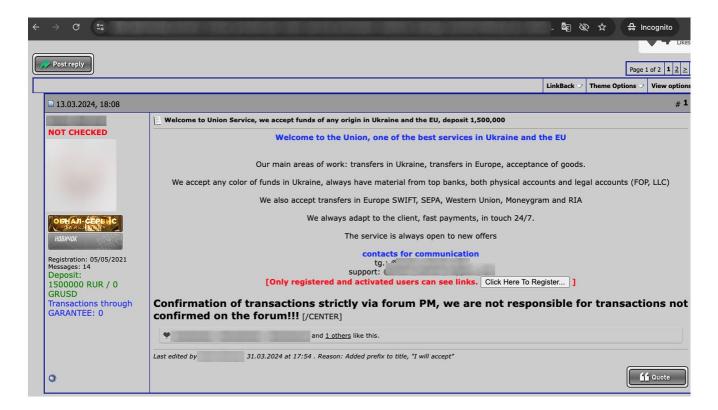


Figure 26. Money laundering service offer operating in Ukraine and Europe

#### Cryptocurrency mixers

Cryptocurrency mixer services cover the true paths of previous crypto transactions, making it more difficult to trace cyber-actors by following where the money flows. Many mixers are also offering cashout services and conversion between different crypto currencies.

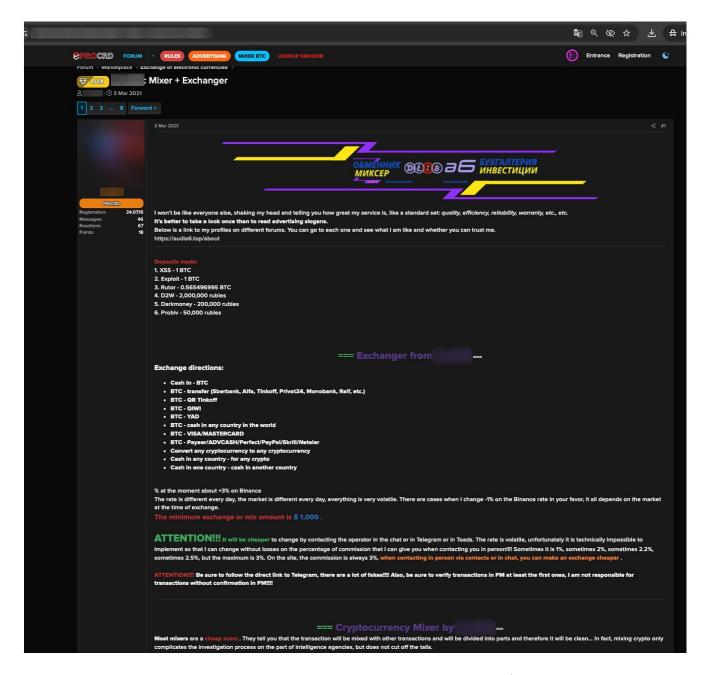


Figure 27. An example of a mixer service offering. This service has a minimum amount of US\$1,000, and commission rates vary from 1-3%

#### Cashouts

Cashouts are services that allow a criminal to convert any illegal transaction to real money. The input might be a cryptocurrency transfer, a credit card transaction, a web shop purchase with a stolen card, or any other illegal source of income. Numerous schemes for this exist, which is an entire area of research on its own. Cashout services are widely available on criminal forums and telegram channels, with interest rates ranging from 5-20%, and often operate using money mules, credit cards, and shell companies.

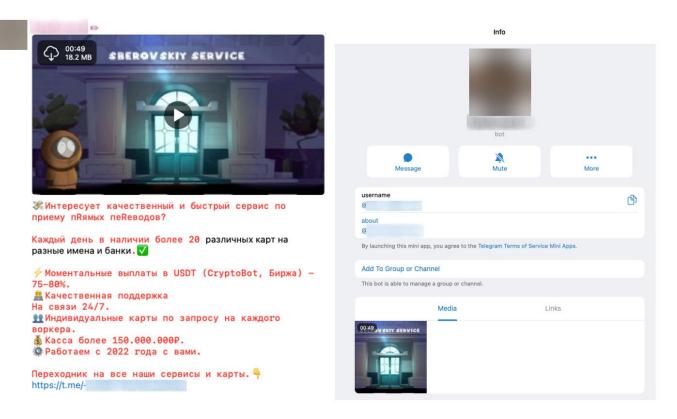


Figure 28. A cashout service advertised on Telegram, which is claiming to have over RUB 150 million (or US\$1.5 million) in assets

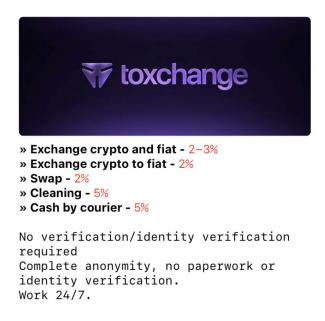


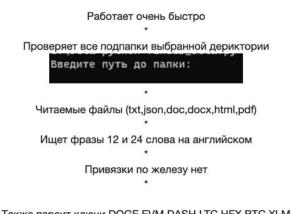
Figure 29. Example of cryptocurrency cashout rates

### Cryptocurrency

Cryptocurrency is an asset used not just to pay for nearly every underground service, but also to transfer and exchange money all over the world. Cryptocurrency is widely used as a payment method for illegal goods, like drugs or guns. That means there are many wallets of criminal or questionable origin, and the owners of such wallets will rarely contact law enforcement agency in case their currency is stolen. Also, for legitimate users of cryptocurrency wallets, there is often limited regulation or capability to investigate crimes against them, making crypto wallets an interesting target for cybercriminals.

#### Seed parsers and checkers

Seed phrases are needed to unlock crypto wallets. Tools to automate verification of stolen seed phrases are available on the underground together with specialized dictionaries for brute forcing them.



Также парсит ключи DOGE,EVM,DASH,LTC,HEX,BTC,XLM				
BTC_keys	30.11.2023 9:32	Текстовый докум	26 KB	
DASH_keys	30.11.2023 9:32	Текстовый докум	416 KB	
DOGECOIN_keys	30.11.2023 9:32	Текстовый докум	758 KB	
■ EVM	30.11.2023 9:32	Текстовый докум	1 K6	
inder finder	01.11.2023 19:40	Приложение	6 064 KB	
KEYS	30.11.2023 9:32	Текстовый докум	4 342 KB	
LITECOIN_keys	30.11.2023 9:32	Текстовый докум	491 KB	
SEED	30.11.2023 9:30	Текстовый докум	1 K6	
XLM_keys	30.11.2023 9:32	Текстовый докум	511 KB	

Цена : 100 USD Исходник : 200 \$

Figure 30. Seed phrase parsing tool offered for US\$100, or US\$200 with the source code.

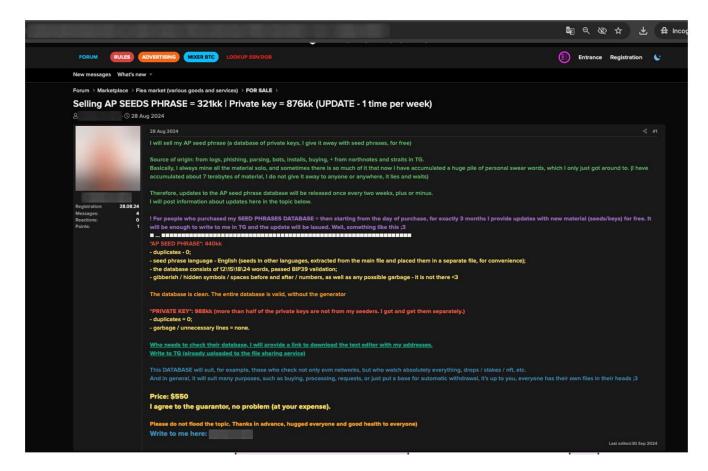


Figure 31. Seeds brute forcing database advertisement for US\$550

#### Crypto wallet brute force services

Together with the tools to monetize crypto wallets, the underground provides services to implement brute force attacks against crypto wallets (separate from the seed phrase dictionary attacks described earlier). The advertisement in Figure 32 shows a hardware specification from one such service, which consists of 30 PCs with NVIDIA GeForce RTX 4090 cards, a password database with over 500 million passwords, and an 80/20 profit split (the service takes 20%). It is hard to quantify their success rate, however, based on reputation and reviews it appears that people are willing to pay for it.



Figure 32. Advertisement for brute force services of crypto wallets

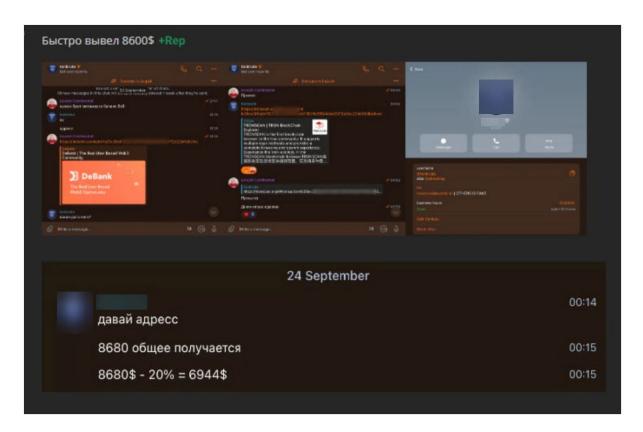


Figure 33. Customer service feedback for a brute force crypto wallet service, from a happy customer who successfully attacked a wallet with over US\$8,000 value

#### Cryptocurrency related customer databases

Leaked databases of cryptocurrency services are important assets that can be monetized in similar ways to databases related to financial and shopping platforms.

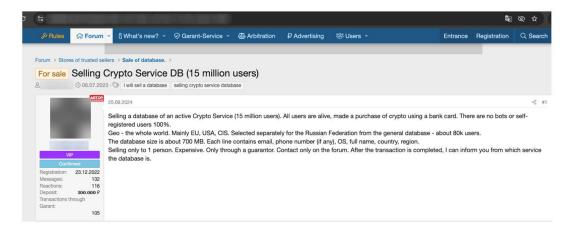


Figure 34. Offer to sell a database of a cryptocurrency service, which contains details of over 15 million users

#### Monetization of wallets with limited access

Stolen crypto wallets can have significant balances, but it is not always possible to extract money from these wallets. We see underground actors looking for alternative ways to monetize such assets. For example, in the request shown in Figure 35, a criminal looks to monetize a wallet with 816 Ethereum (approximately US\$2 million), but with a broken private key (making it inaccessible). They are suggesting it can still be used by others as part of a crypto scam e.g., to make it look like the scammer has funds available.

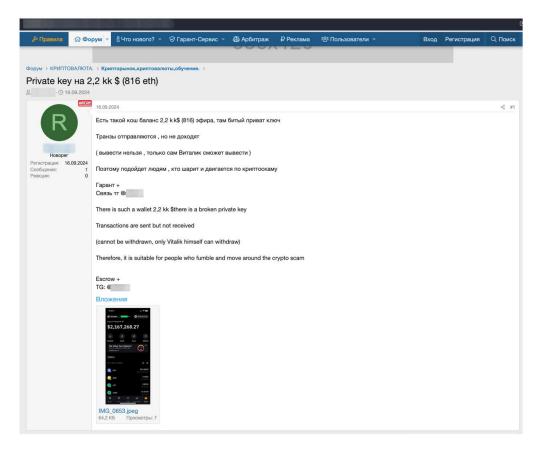


Figure 35. Sale of crypto wallet with significant balance but broken private key

#### BTC transaction cancellation scam

The existence of accounts with high balances, together with the inherent technical complexity of cryptocurrencies, and users' limited understanding of how they work, creates a niche for cryptocurrency related scams. The screenshot in Figure 36 shows a job offer for a scam that is based on BTC (Bitcoin) transaction cancellations. We can also observe the untrusted nature of the underground here, since the employee should provide a deposit of US\$100 as a guarantee of intent to start the job.

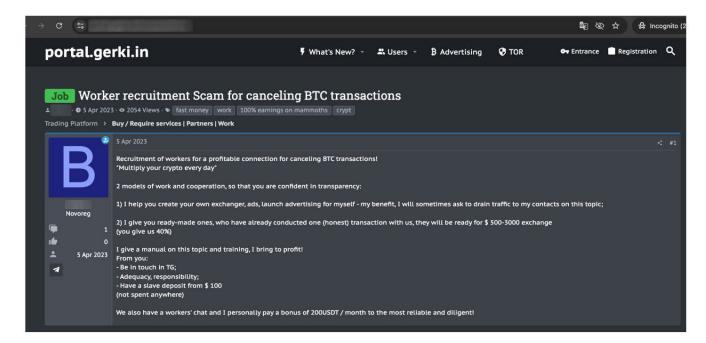


Figure 36. Job offers for a BTC transaction cancellation scam

# Social engineering

Social engineering is used to trick victims into providing sensitive data like passwords, credit card numbers, or 2FA confirmation codes. The screenshot in Figure 37 shows an advertisement to join a team focused on bringing victims into overpriced bars and restaurants, which are either controlled or in collaboration with this group. The victim is tricked into spending money, which is then split among participants.



Figure 37. Invite into a team to social engineer victims into spending money in overpriced bars and restaurants, which are collaborating with the team. This shows a crossover between online and physical scam communities in some regions.

# Romance baiting

Romance scams have an impact of over US\$1 billion<sup>7</sup> annually, and related business processes and vacancies are very common on the criminal underground. The screenshot in Figure 38 shows a vacancy to join a romance scam team and interact directly with a potential victim. The job offers 20% revenue from the first, and 10% from future deposits paid by the victim.



Figure 38. Vacancy for a romance baiting position

Support services that help such operations are available. Figure 39 shows an offer to sell photographs of female individuals, extracted from compromised iCloud accounts.



Figure 39. An offer to sell pictures of females from compromised iCloud accounts, to help with romance scams

Specialized tools are also available for use in such scams. The screenshot in Figure 40 shows a bot that is capable of generating a female voice.

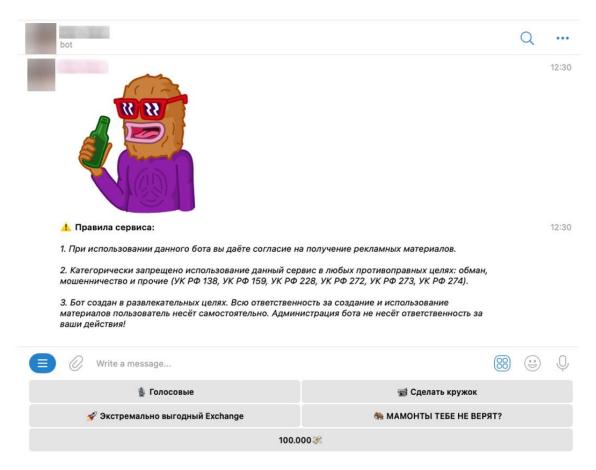


Figure 40. Bot to generate female voice for use in scams

### Social media services

Social media services are popular in the underground, particularly related to business processes that operate in gray areas between crime and legitimacy. Such services often also have applications in SEO as well as other criminal business processes and psychological operations.

## Media design services

Like other online services, criminals need good media and website design services. This includes criminal web facing assets, such as forums and shops. Such services are especially needed for criminal business processes where the monetization level directly depends on the quality of design, such as for assets used in phishing and scam campaigns.

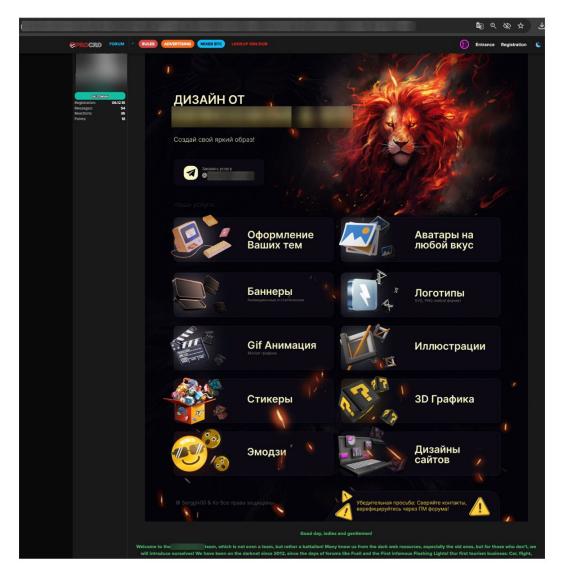


Figure 41. Media design offer from an underground design studio. Besides website design, the studio also offers avatars, logos, 3D graphics, stickers, banners, and custom requests.

## Adding verified account tag

For many criminal business models, convincing someone of authenticity through an initial interaction via a messenger or social media platform often determines the success of the overall attack. In cases where preexisting trust is not present, factors like verified accounts are critical to build initial trust. Underground forums offer options such as the ability to add verified account tags to social media.

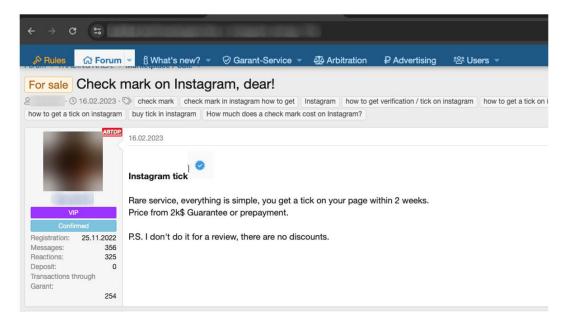


Figure 42. A service that adds a verified account tag to Instagram accounts for US\$2,000. The size of the payment should give an indication of the volume of profit expected as a result of using these.

### Likes, comments, and followers

Likes, comments, and followers are integral factors to attract attention to a particular post or to make an account look more legitimate. These techniques are used in public opinion manipulation campaigns<sup>8</sup> and as a part of social engineering and scam operations.

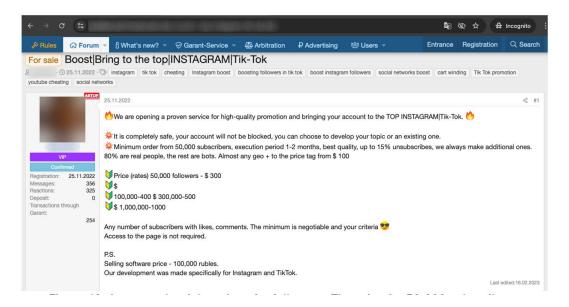


Figure 43. An example of the prices for followers. The price for 50,000 subscribers, delivered in one to two months, is US\$300.

The cost of software that can be used to boost Instagram and TikTok accounts is US\$1,000.

# Social media spamming in private messages and groups

Spamming private messages or groups is in demand and we see many offers of the service on the underground. For example, the price for 1,000 private messages or posting a message to 500 groups is RUB 5,000 (about US\$50).

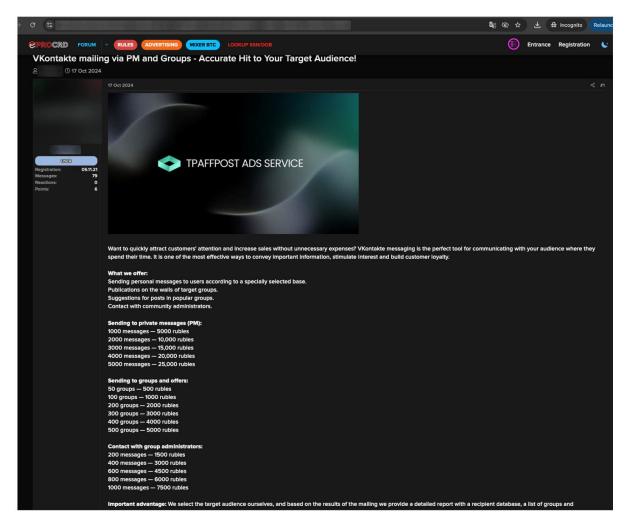


Figure 44. Example of prices for sending messages to PMs and groups

### Access-as-a-service

#### Hacking of accounts

Services to hack into a particular account – which can be email, social media, messenger platform or even corporate or equipment management accounts – have a significant demand on the underground. Figure 45 shows an example of such a service with prices.

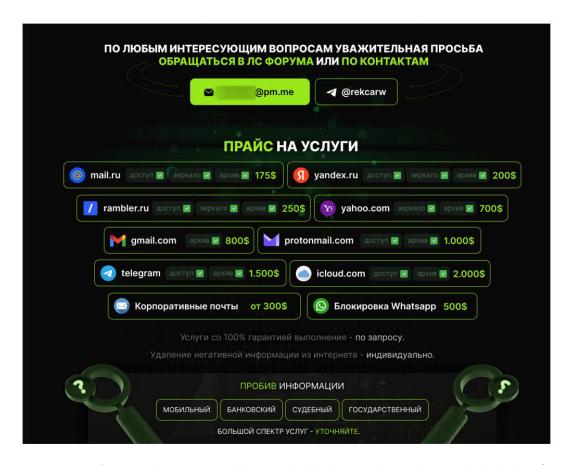


Figure 45. Pricing for account compromise: the price to attack corporate email accounts starts at US\$300, ProtonMail accounts at US\$1,000, and blocking a WhatsApp account at US\$500.

#### Online account creation

Automated platforms for mass account creation help underground actors scale their business processes. On the screenshot below you can see an automation bot for renting and purchasing phone numbers, this can be used to create accounts on many online services at scale. The service claims to be operating with phone numbers from 189 countries, supporting over 1,000 online service platforms and 217 mobile operators.

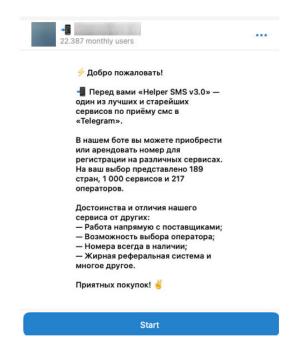


Figure 46. An Account creation service (leveraging SMS landing services) with support for 189 countries

Another service, advertised on the ProCrd forum, provides access to USA based numbers. A 15 minute rental costs US\$0.50, while long-term rental for a week starts from US\$3.50, and from US\$11.50 for a month.

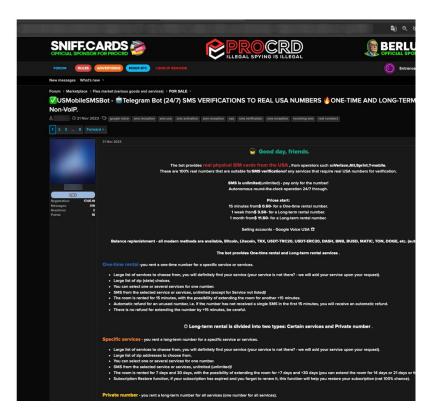


Figure 47. SMS verification offer on real USA numbers - for use in account creation

# Online account sales (e.g., Hulu, Netflix, food apps)

Due to the scale of demand and variety of criminal business processes that leverage accounts for different online platforms, those accounts are often sold through bot automation or using dedicated shops. The price model often depends on the age of account, level of verification, and activities. For social media and messenger platforms, this can factor in the number of subscribers, groups owned by the account, and how the account was created (manually or using automated tools).

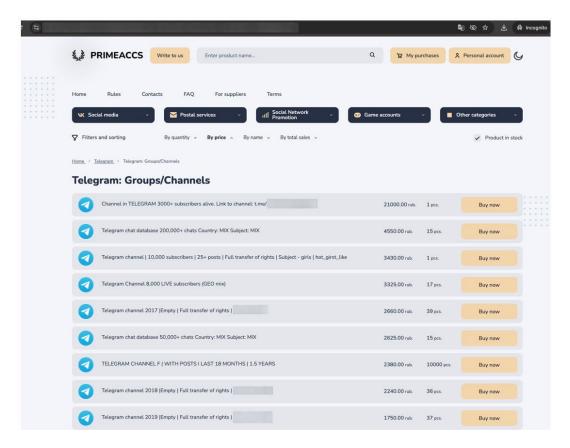


Figure 48. Shop with pricing for telegram channels, with subscribers being a differentiating factor in price



Figure 49. A list of Instagram accounts and services, with the highest price offer (top) vs cheapest price offer (bottom). Overall, these range from as little as US\$0.04 up to around US\$700, which shows how the account type affects pricing.

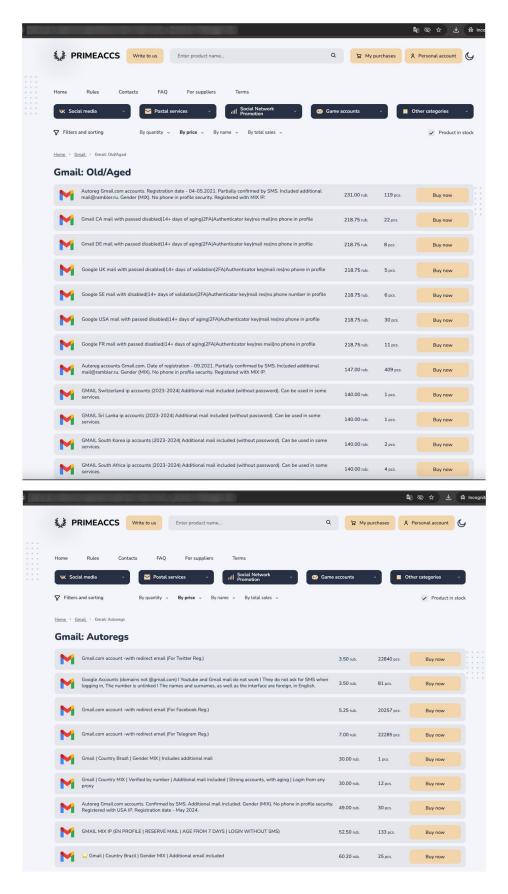


Figure 50. Aged Gmail accounts (top) vs auto registered (bottom), showing a clear difference in price range (from US\$0.03 to US\$2.30)

# Banning assets from the internet

Banning accounts, deleting groups, channels, bots, or chat services can often be leveraged as part of extortion, revenge attacks or competitors' unfair interactions. The prices for such services often range between US\$300 to US\$500. The screenshots in Figure 51 and Figure 52 show advertisements of such services for WhatsApp, Instagram, TikTok, Facebook, VK, OK, YouTube, and X platforms.

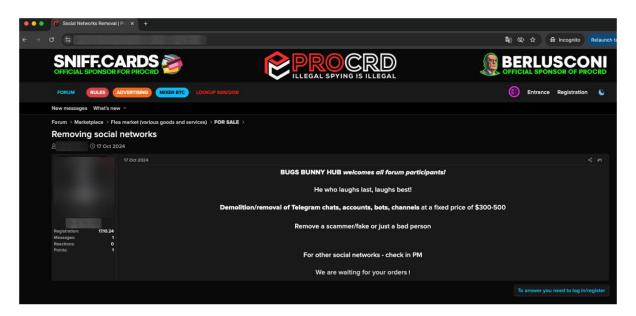


Figure 51. Service for banning telegram accounts, channels and other media platform assets

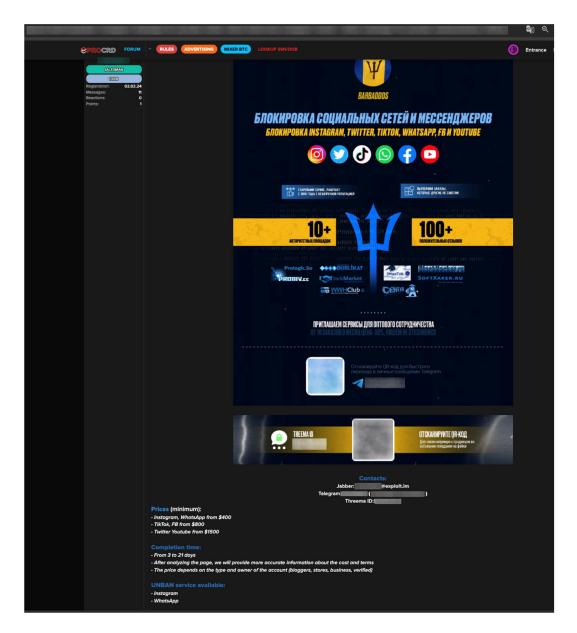


Figure 52. Service for banning accounts on major social media networks, ranging from US\$400 to US\$1,500

# Provision of infrastructure

In the cybercrime underground, a criminal's infrastructure serves as the foundation of their entire business model. It hosts anonymizing services for keeping their activities private, command-and-control (C&C) servers for taking advantage of victims' machines, and discussion forums for communicating with other criminals. Infrastructure enables threat actors to harbor cybercriminal components and carry out their malicious activities.

Provision of infrastructure services is well-developed in the criminal underground. While they are evolving over time, Trend Micro did a three-part in-depth series on this aspect of the underground ecosystem in 2020.9.10,11

# Hosting services

Hosting services are split into several categories, including physical equipment, VPS, and hosting, which leverages fast flux technologies. The prices for these services depend on geographical location, equipment specification, required network connectivity, and permitted activities. Pricing is normally listed in a "USD/Month" format.

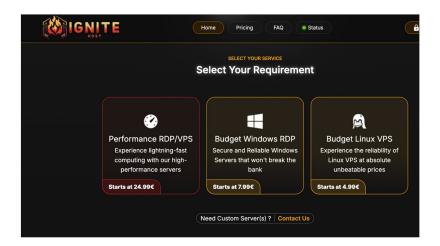


Figure 53. Hosting provider offering encrypted RDP/VPS, Windows RDP access, and Linux VPS

The list of permitted and non-permitted activities is often included in the advertisements for these services. For example, in the screenshot below, the hosting service explicitly states that it ignores Spamhaus requests, while any services related to drugs, child sexual abuse material (CSAM), terrorism, DDoS attacks, mass scans, actions against any government or country, and conducting activities in CIS countries are not permitted.

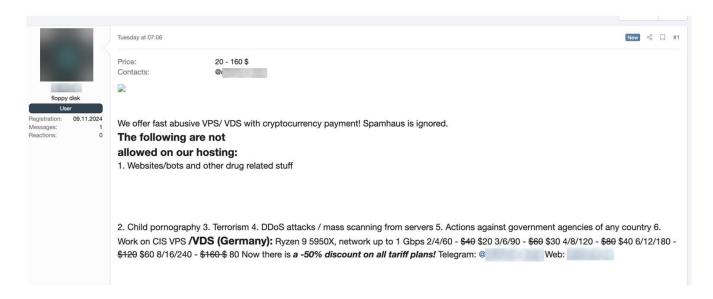


Figure 54. VPS/VDS service offer that ignores Spamhaus requests, but lists a range of services they do not permit to avoid too much attention from authorities. Spamhaus is a domain and IP reputation service.

The post below shows prices for hosting depending on location, hardware specification, and connectivity.

#### **TARIFFS**

Need more RAM? Faster network speed? Need to increase disk size, change server location? Just tell us and we will make a turnkey server especially for you!

#### Additional services

 $domains, 30 + TB SSD \ on \ request, servers for \ Nox \ emulators, \ Blue Stacks, \ LD \ Player, \ MEmu, \ Open VPN/Wireguard \ configs \ and \ much \ more.$ 

#### ATTENTION!!!

These are not all the servers we have. You can see the rest of the configurations in the telegram channel, or by request in PM.

#### **NETHERLANDS**

Netherlands	1 CPU core	1 Gb RAM	20 Gb SSD	up to ~1 gb/sec network	850 rub/month	ORDER
Netherlands	4 CPU core	8 Gb RAM	60 Gb SSD	up to ~1 gb/sec network	2890 rub/month	ORDER
Netherlands	6 CPU core	32 Gb RAM	80 Gb SSD	up to ~1 gb/sec network	6500 rub/month	ORDER

#### **RUSSIA**

Russia	1 CPU core	1 Gb RAM	20 Gb SSD	up to ~1 gb/sec network	250 rub/month	ORDER
Russia	4 CPU core	8 Gb RAM	30 Gb SSD	up to ~1 gb/sec network	1170 rub/month	ORDER
Russia	12 CPU core	24 Gb RAM	80 Gb SSD	up to ~1 gb/sec network	2650 rub/month	ORDER

#### USA

USA	2 CPU core	2 Gb RAM	30 Gb SSD	up to ~1 gb/sec network	970 rub/month	ORDER
USA	4 CPU core	8 Gb RAM	80 Gb SSD	up to ~1 gb/sec network	2790 rub/month	ORDER
USA	8 CPU core	12 Gb RAM	140 Gb SSD	up to ~1 gb/sec network	5500 rub/month	ORDER

#### EUROPE AND THE EAST

Germany, Romania, Poland, Israel, Turkey, Czech Republic, Finland, Moldova, Hungary, Bulgaria, Slovakia, Hong Kong

Germany	2 CPU core	2 Gb RAM	20 Gb SSD	up to ~1 gb/sec network	860 rub/month	ORDER
Czech Repub	olic 4 CPU coi	re 6 Gb RAM	60 Gb SSD	up to ~1 gb/sec network	2190 rub/month	ORDER
Poland	8 CPU core	12 Gb RAM	140 Gb SSD	up to ~1 gb/sec network	4890 rub/month	ORDER

#### SOME MORE POWERFUL READY-MADE CONFIGURATIONS

18 CPU core	36 Threads	64 Gb RAM	240/480/960 Gb SSD	1 gb/sec network	ORDER
22 CPU core	36 Threads	64 Gb RAM	240/480/960 Gb SSD	1 gb/sec network	ORDER
28 CPU core	56 Threads	64 Gb RAM	240/480/960 Gb SSD	1 gb/sec network	ORDER

Figure 55. Examples of pricing based on different locations and configuration

#### Fast flux

Fast flux is a domain name service (DNS) obfuscation technique that botnets use to hide their servers behind an ever-changing network of compromised machines or proxies. Fast flux hosting has its own specifics and limitations, but a key shared property is that it is really hard to take down assets hosted this way. Figure 56 shows an example of a fast flux hosting advertisement.

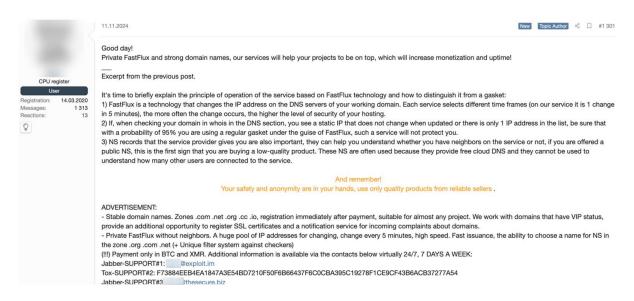


Figure 56. A fast flux hosting service offer that only accepts payment in cryptocurrencies

### Residential proxies

Residential proxy providers provide paying customers access to residential IP addresses, usually for the nominal purposes of web localization testing, advertisement survey, marketing survey, research, and anonymity.

The role of residential proxies are increasing in today's criminal business processes, partly substituting the needs of classic bulletproof hosting. They allow many criminal businesses to scale processes and target victims from IP addresses with geographical precision, even up to the city of the attacker's choice. This property often helps them bypass security mechanisms like antifraud systems or used to obfuscate crawling services, clickfraud, and more.



Figure 57. An advertisement for a residential proxy service for US\$40 per day

# Telegram marketplaces and marketplace toolkits

Marketplaces are integrated platforms for underground functions, automating sales of goods and services.

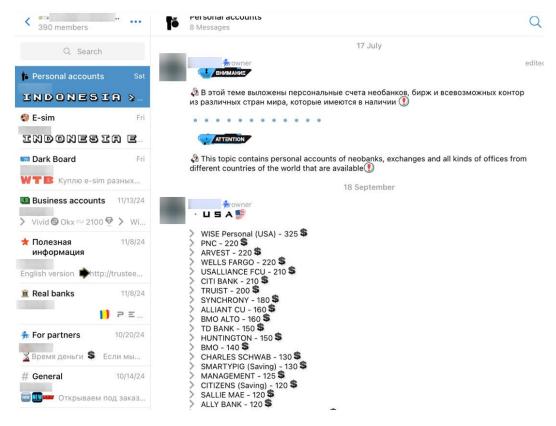


Figure 58. Octopus marketplace for stolen bank accounts (hosted on Telegram)

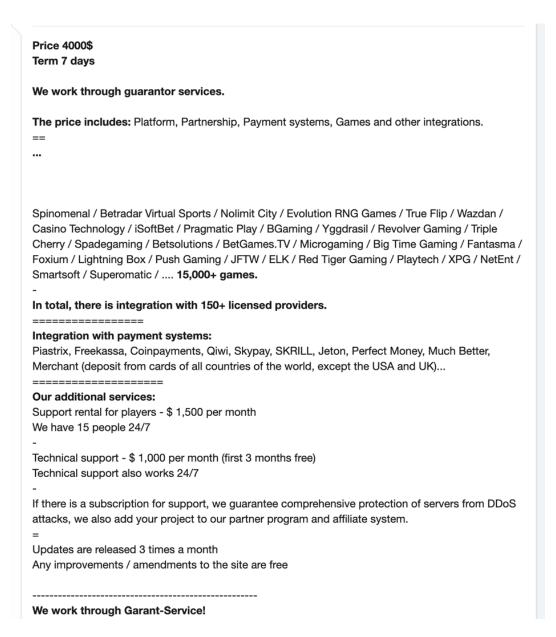


Figure 59. Offer for a marketplace platform all-in-one solution, selling for US\$4,000

### Carding shops and platforms

Carding shops and platforms often sell credit card information with associated details, which ease the bypass of antifraud systems. The collected information includes user agent, location, type, number, bank, holder, CVV, and other information. For the majority of carding shops, it is possible to purchase a card based on the geolocation of its user.

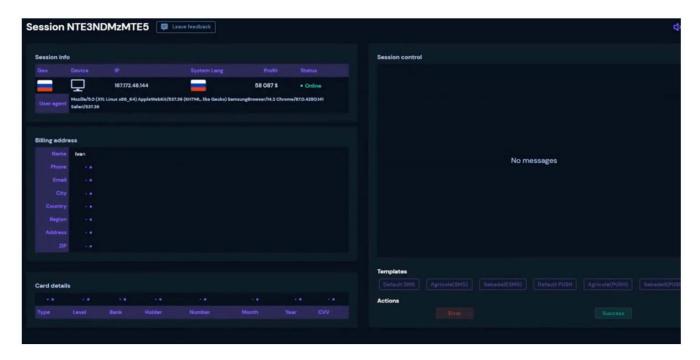


Figure 60. A credit card stealing platform 's interface, which shows the key attributes collected for use by those looking to leverage the stolen cards.

# **Cloud of logs**

A "cloud of logs"<sup>12</sup> is a searchable collection of credentials and other valuable information, which is widely monetized in different criminal processes. These collections are sourced by attackers from infostealer logs, phishing campaigns, breaches, and more – and organized into databases offered as a service to other criminals. There is huge demand for custom queries for such services and logs, which match the business models of various types of underground actors.

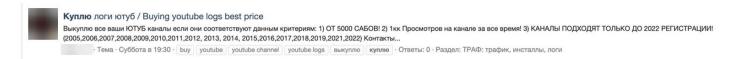


Figure 61. Request to buy YouTube accounts with specific requirements (at least 5,000 subscribers, 1 million total views, registered before 2022)

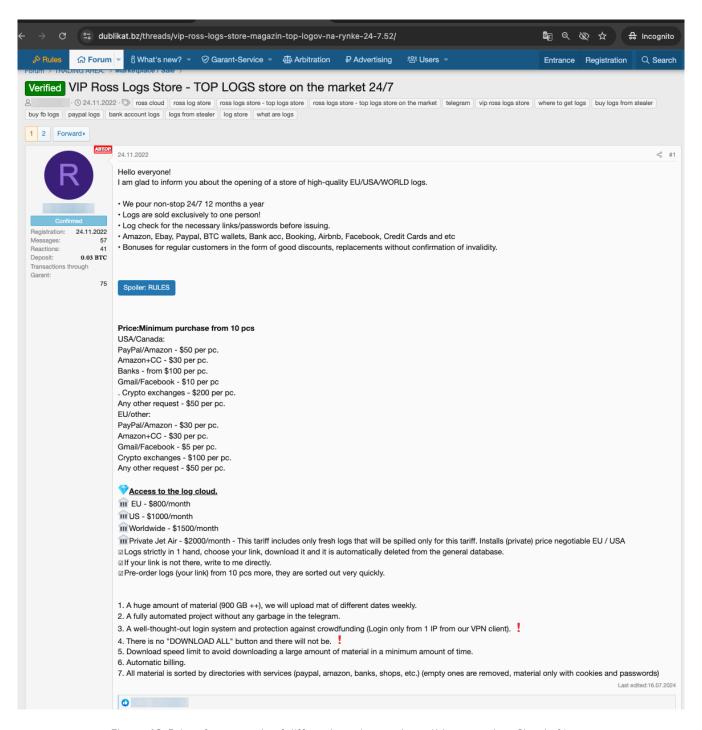


Figure 62. Prices for accounts of different services and monthly access to a Cloud of Logs.

Access to logs collected in Europe costs US\$800, US\$1,000 in the US, and US\$1,500 worldwide

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# Political buyers

There are requests to buy specific accounts, like access to military or government domains, which are rarely monetized by cybercriminals. At the same time, those accounts are within the scope of interest of actors aligned with the interests of nation states – although it is very hard to prove the true origins of the buyers who are looking for these.

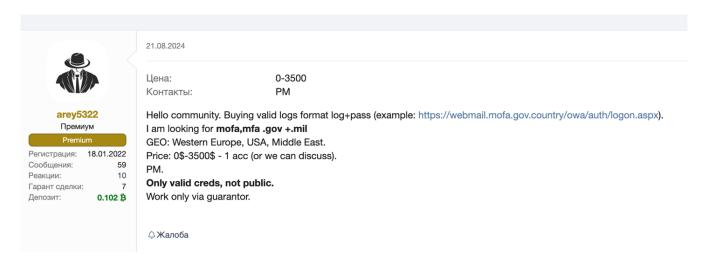


Figure 63. A request to buy stolen accounts from .mofa, .mfa, .gov, .mil domains

# Provision of underground tools

# Criminal business process automation

The tools to scale business operations are a critical part of the common demands and offers on the underground. They can automate different parts of the business processes, like checking the balance of stolen financial accounts, verifying the presence of accounts linked to an email address, and many other functions.

### Scripts to emulate user behavior on compromised accounts

Emulation of user behavior is needed to lower the alert rates of antifraud systems after account takeover. An example of an advertisement for such a tool for Amazon accounts is shown in Figure 64. These cost between US\$700 and US\$1,000, depending on the subscription type.

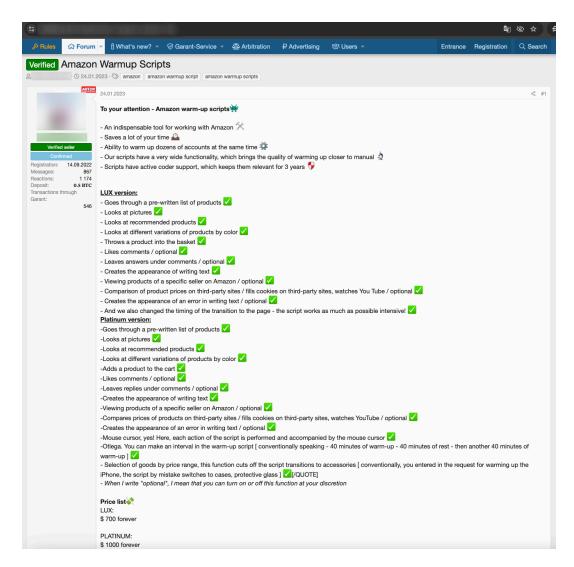
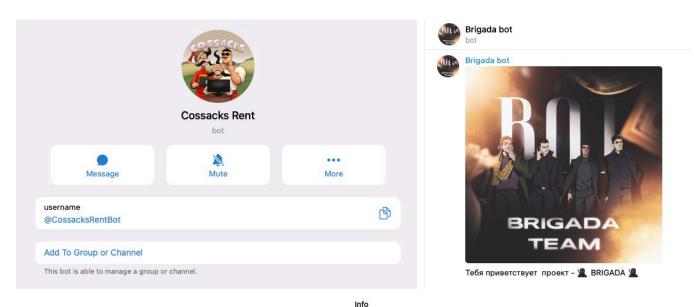


Figure 64. Amazon fraud automation tools costing between US\$700 to US\$1,000

#### Scam assistant bots

Scam bots are automating scam processes to lower the entrance barriers to this niche of cybercrime. Various types exist, depending on the types of scams being automated. The bots are often used to automate and assist scam operations on e-commerce, hospitality platforms, or platforms where used goods are sold. The automation can include stages, like spamming, generating images, or integration with services that retrieve confirmation codes. Figure 65 shows several examples.



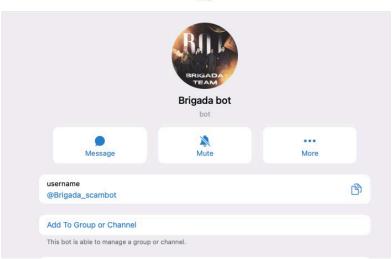
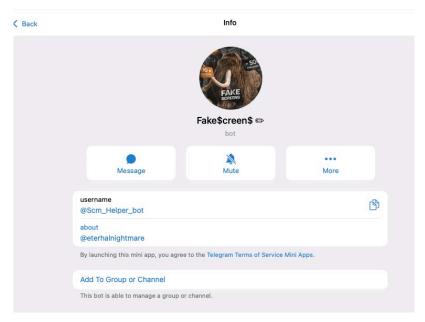


Figure 65. Brigada scam bot

Screenshots are often used on digital platforms as proof of possession of an asset. Fake screenshot generation bots are advertised as a tool to create fake screenshots, which can be used to create the impression of asset possession when conducting scam operations, e.g., owning a certain vehicle, phone, or other high-value items.



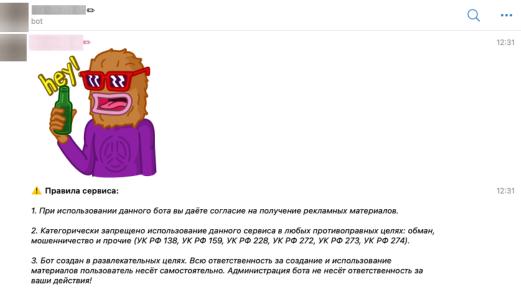


Figure 66. Fake screenshots generation bot

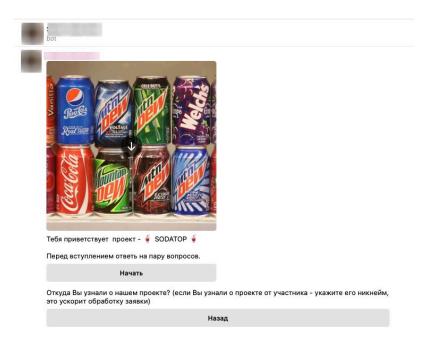


Figure 67. Neutral initial messages from the criminal bot

# Zero-day and N-Day Market

# Zero Day

Zero-day vulnerability-related activities on the underground are often conducted in personal messages or within smaller trusted groups, less so in open discussions. Possession of a zero-day provides attackers with unique capabilities, but only for the period in which the vulnerability has not been patched. Publication of advertisements in public threads are rare.

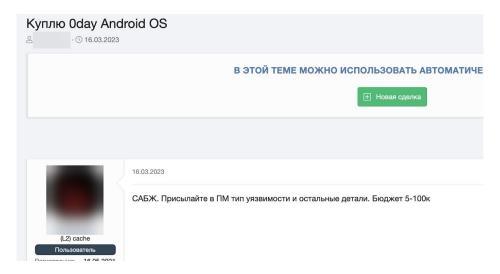


Figure 68. Request to buy a zero day for Android OS. The announced budget is in the US\$5 to US\$100,000 range.

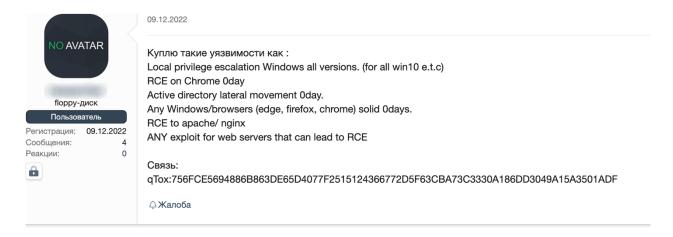


Figure 69. Request to buy a variety of zero days from two different actors. This includes requests for local privilege escalation for Windows OS, Active Directory lateral movement, Google Chrome, any Windows OS-based browsers, and remote code execution exploits for web servers.

### **N-Day**

The N-Day vulnerability market is more open, and requests are often related to reliable private exploits for known vulnerabilities. Figure 70 shows an example of a request related to Remote Code Execution Vulnerability CVE-2024-38077 (Windows Remote Desktop Licensing Service).



Figure 70. Request to buy a private exploit for Windows Remote Desktop Licensing Service RCE

### **Crimeware**

Crimeware is one of the key assets required in many business processes. Crimeware is split into many categories, such as Counter AV tools, account checkers, cryptors, DDOS, infostealers, crypto wallet drainers, and many more. The following section lists examples of such tools.

### Counter AV (CAV) Tools

Today's security software platforms, which are used to protect the infrastructures that attackers target, are a key part of the risk model attackers must consider when planning their attacks. As a result, verification that malware should function as expected before deployment in-the-wild is an important step to ensure the success of their operations. To serve this function, criminals offer multi-scanner services that will test malware in advance against a range of vendors so they can perform QA before launching an attack. These services are normally configured to attempt to avoid sending feedback to security engines (or avoid including solutions for which this is not possible).

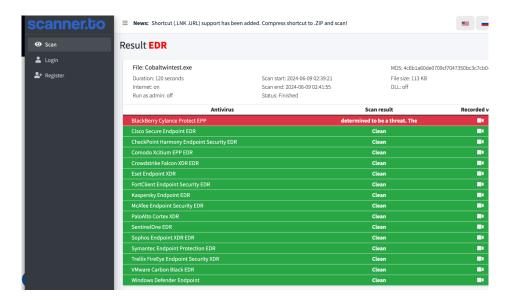


Figure 71. The results of the work of an EDR checker tool. Not all services on the market are included (including Trend Micro).

The interface and the results of the AV check service are shown in Figure 72.



Figure 72. An example of an AV check service

### Checkers

Account validation tools, also known as checkers, are used to estimate validity and the value of stolen or collected accounts at scale. Figure 73 shows an example of a log checker with a rental price of US\$15 per week or US\$40 per month.

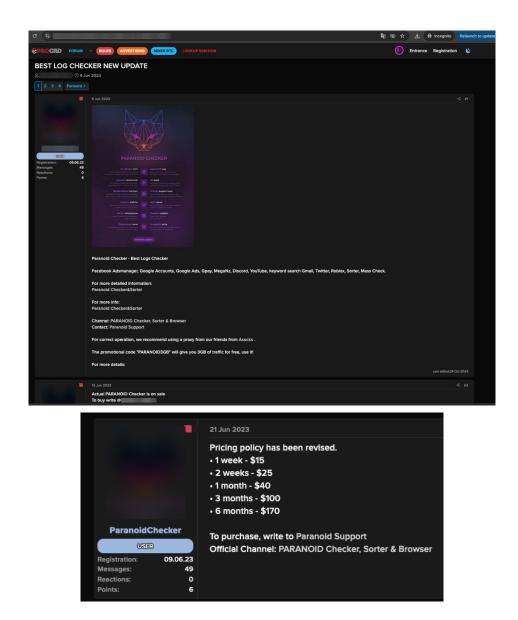


Figure 73. Account validation tool with various price points. The post claims that the tool works for many common accounts including Facebook, Google, Discord, YouTube, and more.

# **Cryptors**

Cryptors modify existent files to minimize or bypass detections of security software. They are often used in combination with Counter AV (CAV) services described earlier.



Figure 74. Advertisement of a loader/cryptor. Many such tools exist on the market with their popularity based on performance at avoiding detection

### **DDoS/Stressors**

Distributed denial-of-service (DDoS) attack implementation normally requires access to many assets that are capable of attacking a target simultaneously. The tools to carry this out are commonly described as "booters" or "stressors" in criminal communities, and are rented for a period of time.

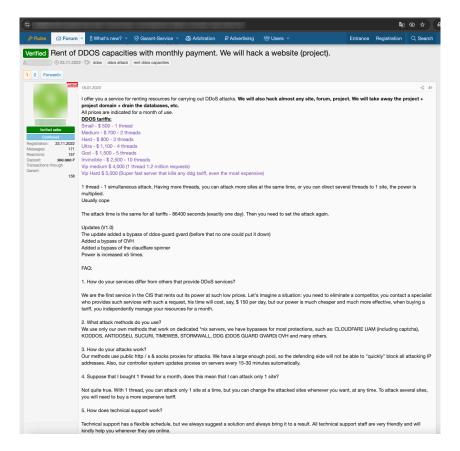


Figure 75. Rent of DDoS capacities with monthly payment ranging from US\$500 to US\$5,000 per month, depending on the scale required

## Crypto wallet drainers

At the time of writing, crypto wallet drainers are trending on the underground. They are a very serious threat for cryptocurrency owners. These tools leverage a variety of methods with the overall goal to "drain" a crypto wallet – effectively emptying it and transferring funds to the attacker.

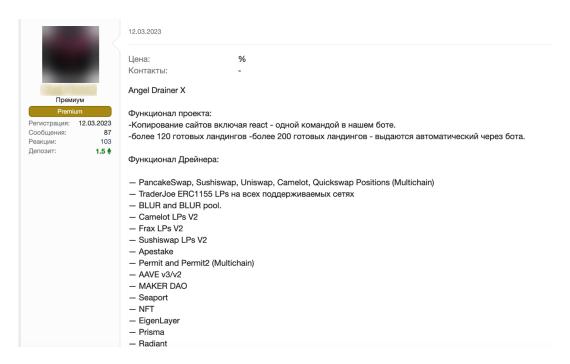


Figure 76. Angel drainer advertisement on XSS forum, listing a long set of cryptocurrency platforms it targets

#### **Infostealers**

Infostealers collect sensitive information, including credentials and payment details, and feed the data downstream to criminal processes where the it is monetized. Stealers are normally created to target particular platforms – such as Windows, Mac OS, or mobile platforms – or even specific applications that run on each of these.

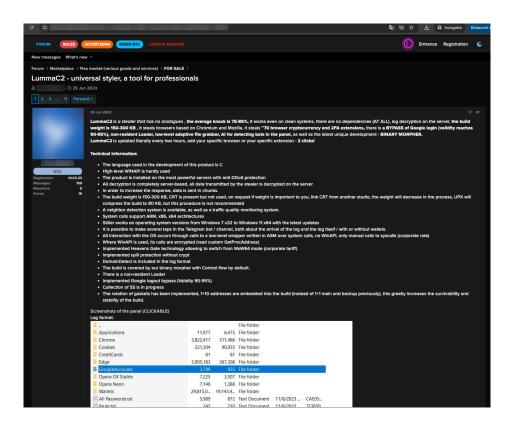


Figure 77. Lumma stealer advertisement showing the long list of technical features contained in what is one of the most popular stealers today

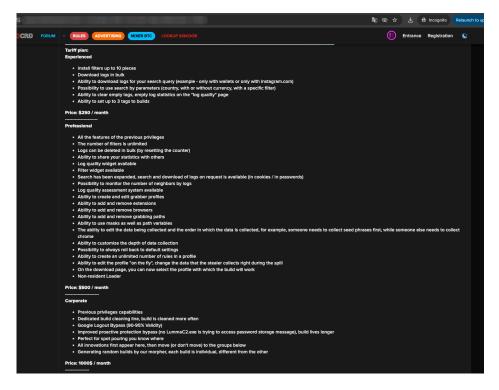


Figure 78. Lumma stealers pricing model with three pricing tiers ranging from \$250 to \$1000 per month depending on the level of features the customer requires

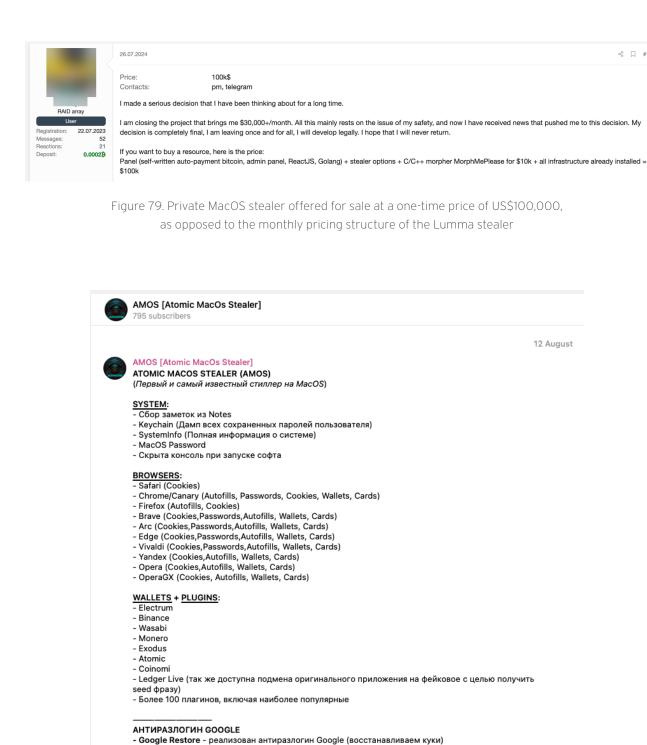


Figure 80. Atomic MacOS stealer priced at US\$3,000 per month

- Обновленная веб-панель. - Красивый dmg установщик.

3000\$/месяц Манибеков нет! Контакт: @

- Отстук в телеграмм(лог + уведомление)

« □ #1

## **Phishing**

Phishing allows cybercriminals to exploit human weaknesses through social engineering and collect sensitive information straight from victims. The phishing ecosystem requires a list of targets, tools, and supporting infrastructure. The following screenshots show pricing models for email databases, requests to leverage SEO campaigns to promote phishing, and an advertisement of phishing toolsets and automation scripts to target telegram accounts.

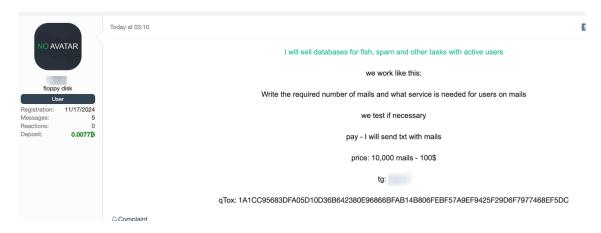


Figure 81. Databases for phishing. The price in the database works out to US\$0.01 per email account.

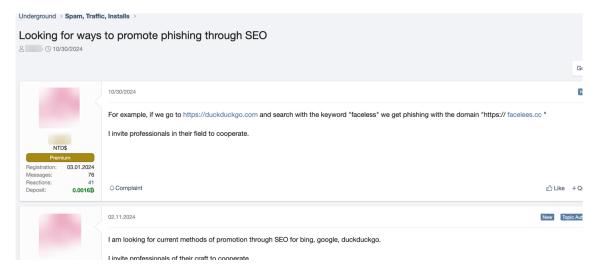


Figure 82. A request for SEO assistance in phishing campaigns

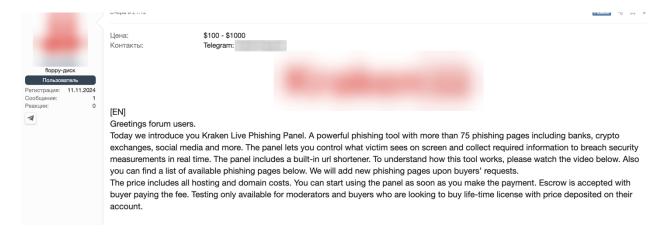


Figure 83. Advertisement of a phishing support tool supporting impersonation of 75 different brands

### Deepfake, KYC, biometrics

Exploitation of unintentionally exposed biometrics<sup>13</sup> is a recent trend enabled by the rising accessibility of AI and scale of use of social media platforms. The leaked biometric data, together with exposed PII, can be leveraged to create identities, and in some cases, bypass biometric based 2FA. The same underlying technologies can also be leveraged in psychological operations, public opinion manipulation campaigns and evolved extortion, and BEC criminal business processes – including deepfakes. This is currently an emerging market that is slowly maturing in the underground.

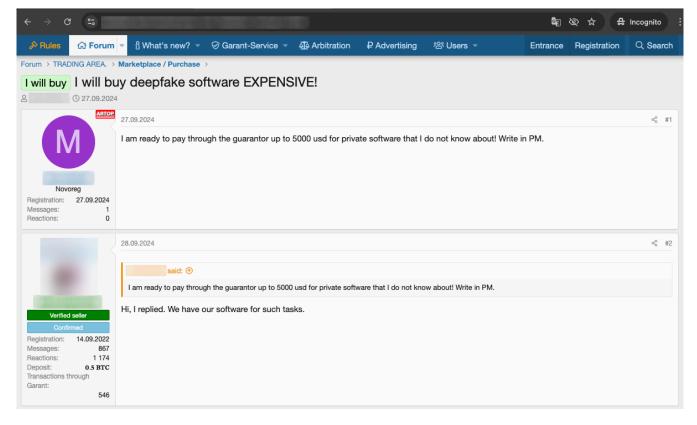


Figure 84. An offer to buy deepfake software for US\$5,000. The prompt reply (within the day) shows how active that market segment is.

#### **RATS**

Remote access tools (RATs) are in high demand on the underground, with prices normally ranging in the thousands of dollars.

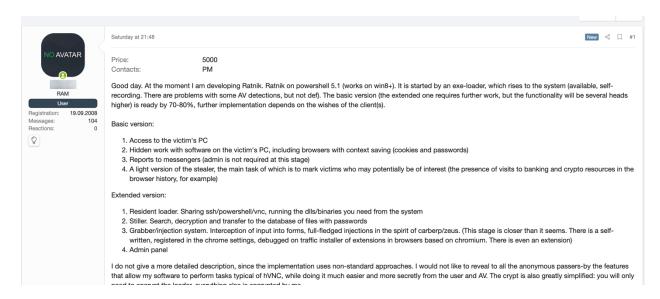


Figure 85. Advertisement of the PowerShell-based RAT for US\$5,000



Figure 86. An Android RAT that costs US\$2,500 for two months, or US\$6,000 for unlimited usage

# IT-enabled crime

Besides its primary role in supporting cybercrime, the criminal underground also provides support for the demand and sale of adjacent criminal activity (known as cyber-enabled crime). This area can often be thought of as traditional crime, fraud, or scam business models – but not amplified by having an online component. While not truly cybercrime, it is significant enough to briefly cover so we can understand this adjacent area of criminality. Some of these services directly benefit cyber-dependent crime (e.g., document forgery, reshipping services for cashout). Others, such as weapons and drug distribution, clearly do not. However, these offerings do occur in the same communities that push cybercrime, showing a clear crossover of interests and a blurring of physical and digital crime worlds that we believe merits inclusion for completeness in this publication.

# Weapons and drugs

Weapons and drugs are sold on some underground forums, but this is dependent on the community – not every forum has related sections or permits for weapon and drugs related advertisements. A lot of advertisements related to drugs use specific slang, like "spices" and "salt," and have their own regionally linked ecosystem and distribution networks. For weapons the advertisement often has the type and specification of the weapon, price, and possible pick up or delivery options. For example, a Makarov pistol, also known by the slang term "PM," is sold for RUB 300,000, which is about US\$3,000. Part of the guns are modified versions of non-lethal pistols, adopted to be used as a normal weapon.

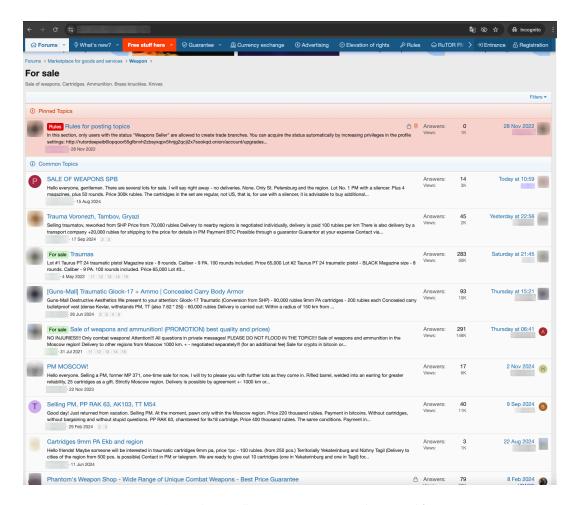


Figure 87. Posts on selling weapons in an underground forum

### Creation of organizational seals

The possession of an official seal for an organization opens a huge attack surface related to the impersonation of the organization. Fake sealed documents are often used as part of fraud or money laundering criminal business processes.

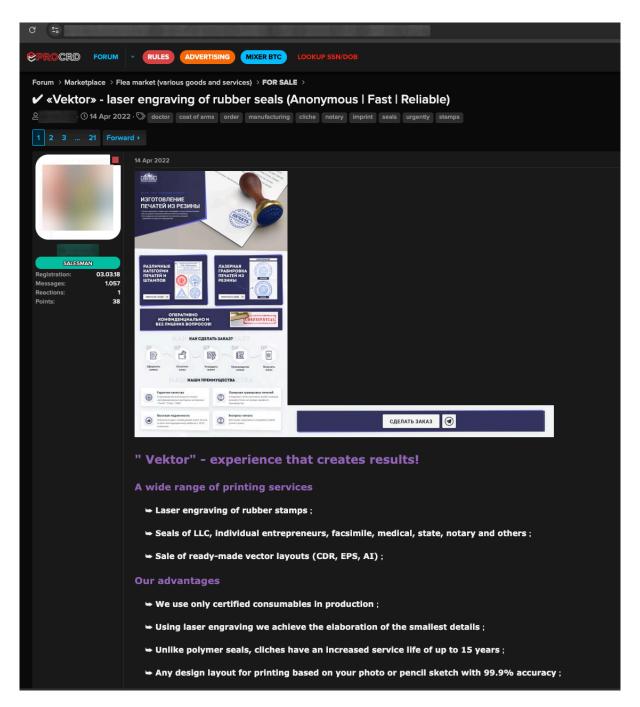


Figure 88. A service that creates seals of organizations, advertised on ProCrd forum

### Fake document services

Fake documents, IDs, and their digital versions are widely used to verify accounts for financial and government institutions and e-commerce platforms. As such, there is a big market for their creation on the underground. The prices for such services normally range between US\$5 to US\$25.

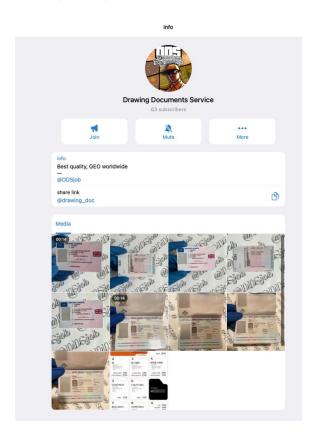




Figure 89. A Telegram channel providing fake electronic images of the documents



REAL DOCS

- PHOTO FRONT&BACK

- PHOTO DOC + SELFIE - DOC + SELFIE WITH DOC

PRICE FROM 5\$

8 TEMPLATES

FORMATS:
- FOR PHOTOSHOP .PSD
- FOR ILLUSTRATOR .AI
- VECTOR

- WITH ALL FONTS

PRICE FROM 30\$

COUNTRIES: USA, EUROPE, CIS, SOUTH AMERICA, NORTH AMERICA, ASIA, AUSTRALIA PAY WITH USDT, BTC, XMR OR ANY CRYPTO MAXIMUM SAFETY AND PRIVACY

Figure 90. A price list for different types of documents



Figure 91. An example of a generated driving license featured as part of an advertisement

### Human trafficking and contraband

Some forums have dedicated sections related to either human border crossing or moving assets, which often include prohibited or counterfeit goods, over a border. The following screenshot shows an example of the forum section related to this activity.

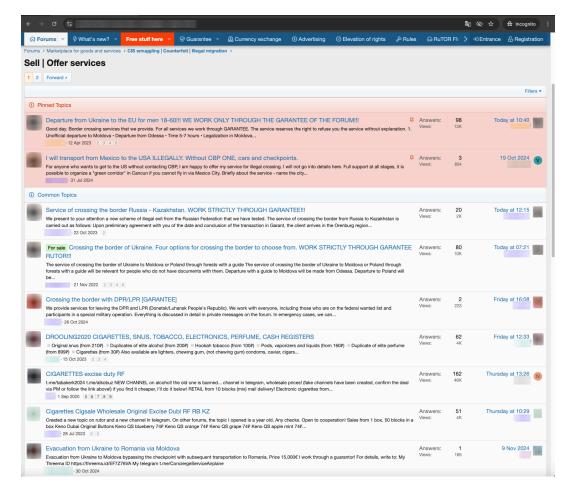


Figure 92. An example of the border crossing and contraband services on the forum, showing human border crossing services in Ukraine and cigarette smuggling

### Travel and leisure

Just like ordinary people, underground actors also travel and have their own ecosystem to fulfil their travel needs.<sup>14</sup> All travel necessities, such as flights, hotels, car rentals, excursions, access to airport lounges, and even flowers and cinema tickets, are provided on the underground at a cheaper price. The price is often listed as a percentage of the normal price, but it can be listed directly for popular destinations. We discussed this ecosystem in much more detail in a previous research linked in this section.

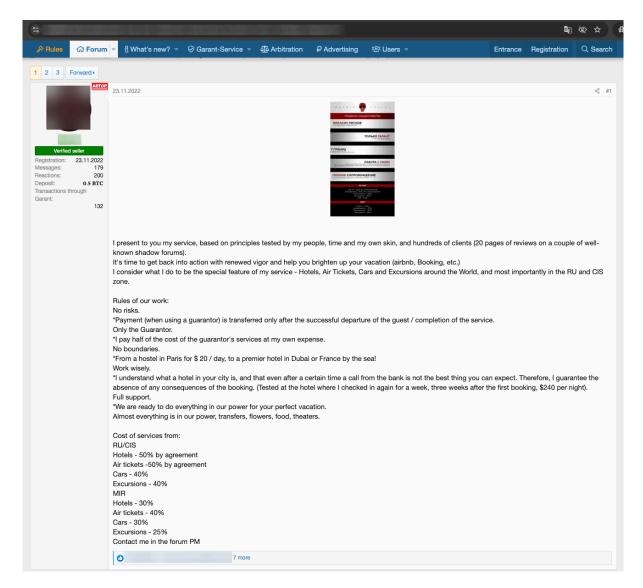


Figure 93. Price ratios for different leisure services using a percentage discount model

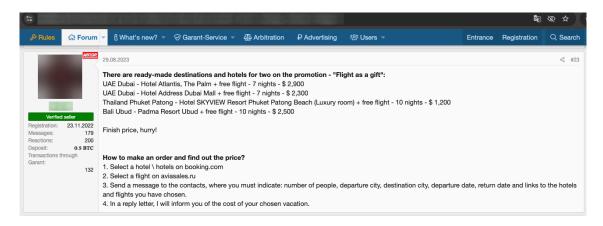


Figure 94. Example of tour prices for several destinations

### Gift cards

Gift cards can be considered currency that can be easily changed into assets. The market for gift cards existed before cryptocurrencies became popular, and such services are still in high demand. The cards are sold with a significant discount compared to original prices, as they are often stolen or used to launder funds (e.g., bought via stolen credit cards).

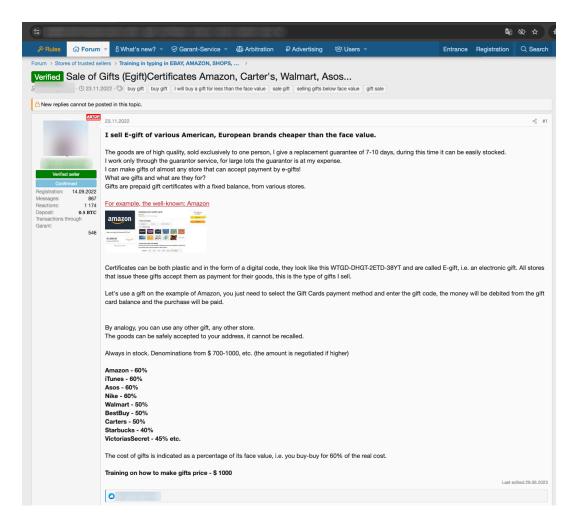


Figure 95. Example of prices for European and American gift cards on underground forums

## Criminal business processes of goods and shipping fraud

Stuffer services are boosted on the underground after many western companies, including major payment providers, left Russia. Stuffer services use stolen credit cards or accounts on e-commerce platforms with linked payment methods. They purchase products from merchants and ship them to addresses from which the "service" can reship them to the final destination. Underground offers for purchase and delivery of products from western and Asian e-commerce platforms, including offers with a significant discount, are widely present on the underground. The following advertisement posted on the Dublikat forum shows goods from Amazon, eBay, or AliExpress being offered for 40% of the original price. The minimum order is US\$1,000, delivery time is up to 15 days.

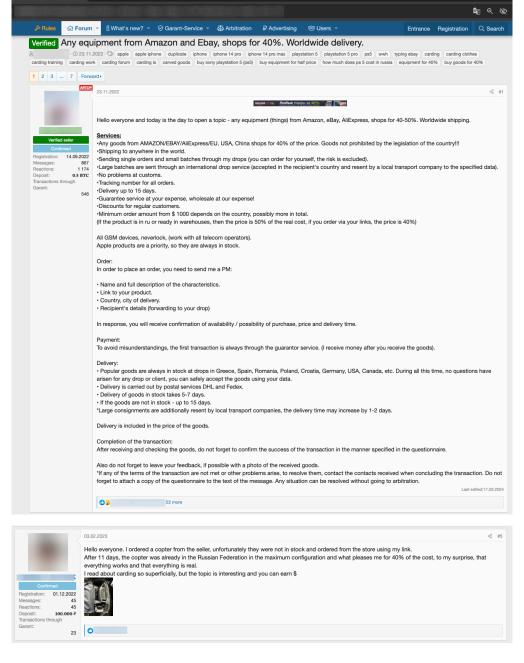


Figure 96. Shipping from major western shops with example of successful delivery and customer reviews

### Car hacking related services

Car hacking related services are accelerating on the underground due to the digitalization of cars and expanding attack surface against connected car infrastructure.

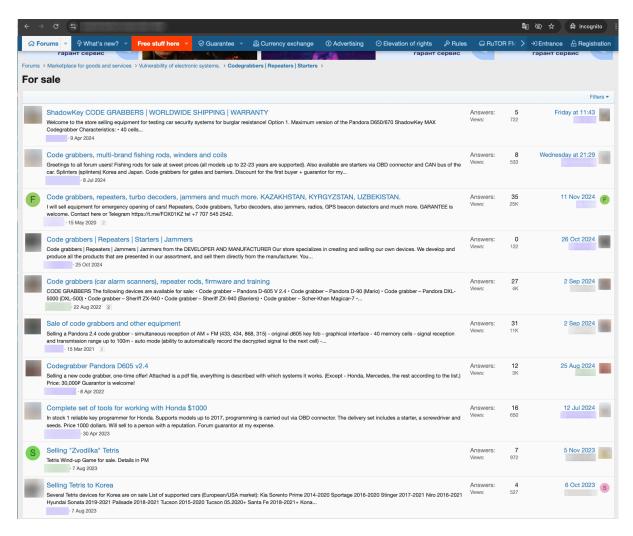


Figure 97. Forum section including offers of equipment and tools to assist car crimes

# Education or training in the Russian-speaking underground

Education is a necessity for starting most careers and jobs, and the criminal underground is no exception. In the underground, reputation, knowledge, and experience are very important. This drives a robust education/training ecosystem that helps cultivate the upcoming talent pool, while providing a source of continued professional development for more senior members of the community.

### Leaked guides and courses on different topics

Collections related to general disciplines are often not considered a directly monetizable asset and often published on the underground for free. By sharing such content, actors are boosting their own reputation within the community. Figure 98 shows a list of courses posted in one of the forum sections on RuTor forum.

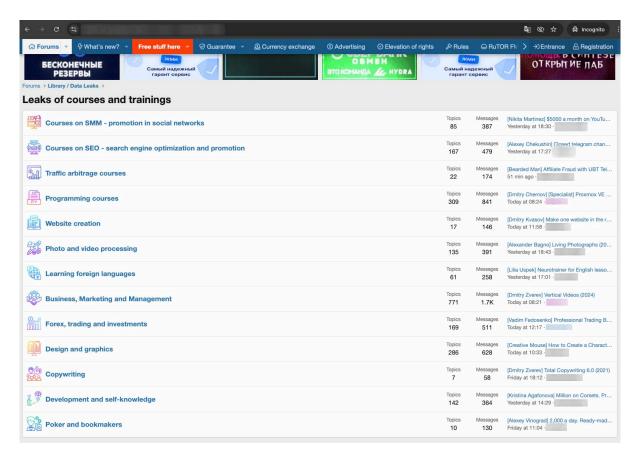


Figure 98. List of the leaked courses available on the underground

Part of the posts provide detailed explanations on how particular criminal business processes work.



Figure 99. A description of a scam against Russian citizens driven from UA provides details how telephone scammers operate

### Deanonymization on the internet

Deanonymization of a target person, or "doxing," is a service that is in significant demand in the underground. As a result, it is possible not only to find services for this, but also manuals explaining typical techniques on how to deanonymize a person.

# Deanon Manual DedSec @Deadtooll \* December 16, 2023 Property of the control of

Figure 100. Example of a guide to deanonymize a person of interest

### Crimeware tool education guides

Let's get started.

1) By getting through the telegram.

Malware infrastructure is getting more and more complicated, and the abuse of such tools can lead to early detection of attacks and takedowns of the infrastructure. The following screenshot shows the price for the popular crimeware tool, Redline stealer, with training included.

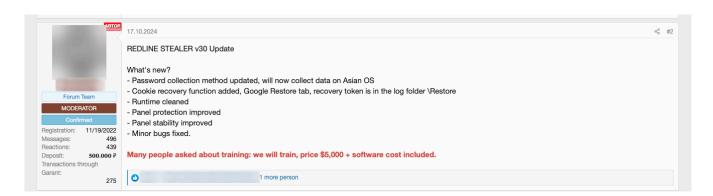


Figure 101. Price of the training for Redline stealer. This is listed as US\$5,000 and includes a copy of the software in the price

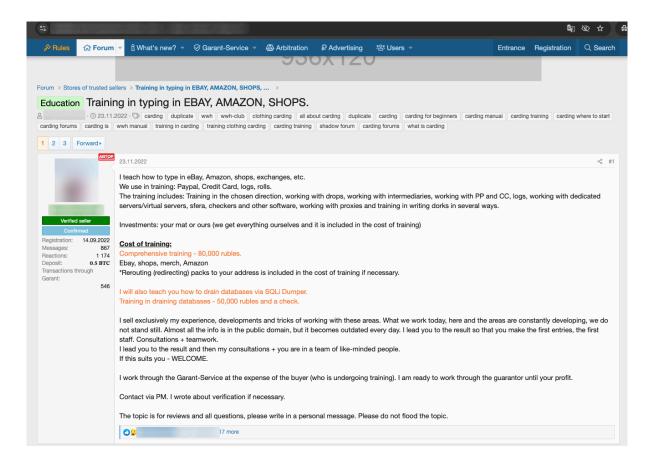


Figure 102. An example of shipping fraud training for RUB 80,000 (US\$800), which includes guides on how to use stolen credit cards, PayPal accounts, and collected credentials to illegally purchase and deliver goods from e-commerce platforms.

### SIM card monetization training

SIM cards and mobile phone numbers are required at different stages of many criminal business processes. They are used to create accounts, scale business process compromise attacks, abuse marketing and promo campaigns, or to transfer money. We have already discussed the tools themselves in detail, but because of their importance, training guides are also readily available.

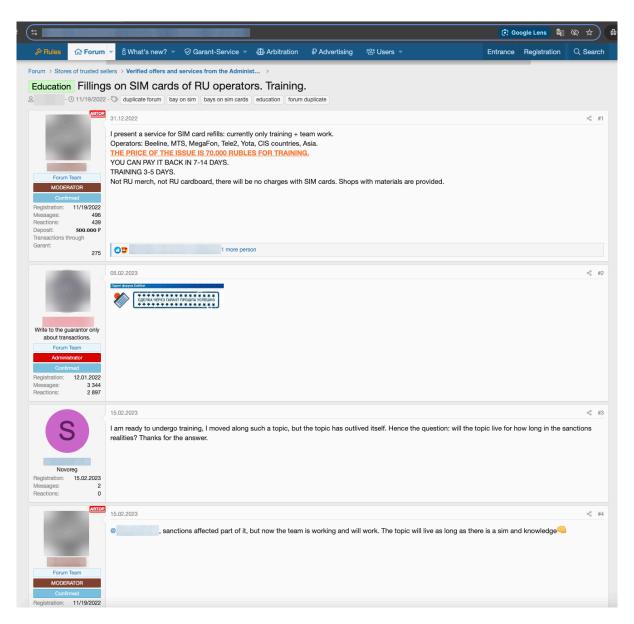


Figure 103. An education thread with training focused on how to monetize SIM cards of Russia-based mobile operators to adjust to sanctions, priced at RUB 70,000 (US\$700)

### **Endnotes**

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