



# The Travels of “markopolo”: Self-Proclaimed Meeting Software Vortax Spreads Infostealers, Unveils Expansive Network of Malicious macOS Applications

Vortax, a self-proclaimed virtual meeting software, proliferates infostealer malware at scale in a cross-platform campaign targeting cryptocurrency users on social media.

Further investigation into Vortax revealed a sprawling infostealer operation, attributed to the Atomic macOS Stealer (AMOS) user “markopolo” — previously identified targeting Web3 gaming.

“markopolo” is an agile, adaptable, and versatile threat actor that quickly pivots their scams upon detection, which is likely indicative of a long-term credential harvesting strategy.

*Analysis cut-off date: May 15, 2024*

## Executive Summary

While monitoring data in Recorded Future Malware Intelligence, Insikt Group identified purported virtual meeting software called Vortax that, upon download and installation, delivers three information stealers (“infostealers”) in cross-platform attacks — Rhadamanthys, Stealc, and, most notably, Atomic macOS Stealer (AMOS) — in an extensive campaign aimed at cryptocurrency theft. AMOS typically has a niche client base because of its high barrier to entry, its low success rate, and the lower demand for macOS infostealers in the cybercriminal underground. AMOS is not often observed in the wild, relative to its Windows-based counterparts, which makes observing such extensive activity around AMOS, including diverse scams, targets, and infrastructure in a single campaign, particularly noteworthy. This campaign, operated by the threat actor tracked as “markopolo”, and its wide-ranging implications also likely signal that future AMOS campaigns will employ similar tactics to spread — resulting in a long-term increase in the volume of AMOS victims.

While macOS stealers are generally less popular than their Windows counterparts, demand is growing, evidenced by an increase in macOS infostealer submissions to Recorded Future Malware Intelligence and an increased volume of references to macOS malware on the dark web. The high volume of AMOS activity observed in this campaign builds on previous Insikt Group [reporting](#), which found that mentions of macOS malware and exploit kits increased by 79% year-on-year from 2022 to 2023, which may indicate a correlation between the overall number of references to macOS malware and the increased frequency of AMOS campaigns observed in the wild ([1](#), [2](#)).

Upon further investigation of the Vortax application, its network of associated accounts, and the malware it deployed, Insikt Group identified 23 other malicious macOS applications masquerading as legitimate — with the majority of scams identified targeting virtual meeting software and cryptocurrency users. We also identified connections between the “Vortax campaign” and a [previous infostealer campaign](#) targeting Web3 gaming projects. Based on these findings, we are confident that the two campaigns are affiliated with the same threat actor — previously identified by Insikt Group as using the AMOS UserID “markopolo”. Given its tight-knit community, we assess that other operators of AMOS will likely model future campaigns after the success of markopolo. This may result in a wider proliferation of AMOS in the wild, accompanied by diverse and wide-ranging campaigns attributed to individual threat actors, exacerbating the long-term threat of a less secure landscape for macOS users.

The Vortax campaign identified in this report is a classic example of the adaptive and scalable nature of malware operations. Given the widespread proliferation of AMOS and the diversity of scams identified in this report, we assess that defenders must consider in-house active security controls that limit an end user’s ability to download unapproved “freemium” software, which is the primary vector employed in this campaign. Blocking all downloads represents a short-term fix, though this will likely be difficult to sustain at scale. Longer-term mitigations will require processes to help vet software products to ensure legitimacy, so as to avoid user execution and an AMOS infection. Once AMOS is on a victim’s system, it

is difficult to detect and monitor due to its “smash-and-grab” nature; therefore, preventive measures must prioritize controlling such activity prior to an infection.

The ability of threat actors like markopolo to pivot their operations and maintain campaign continuity, often on a moment’s notice, poses a significant brand impairment threat to organizations without visibility into, and the capacity to cluster, these campaigns. As with the Web3 campaign referenced above, organizations should seek to insulate themselves from potential impersonation scams and the potential reputational damage of such scams. As we have identified markopolo impersonating several legitimate software downloads (such as “Zoom”, in **Table 4**), we note that organizations should be aware of infostealer operators impersonating their brands to deliver malware. Aside from a risk to legitimate brands, organizations should understand that infostealer infections have follow-on operational and financial consequences.

## Key Findings

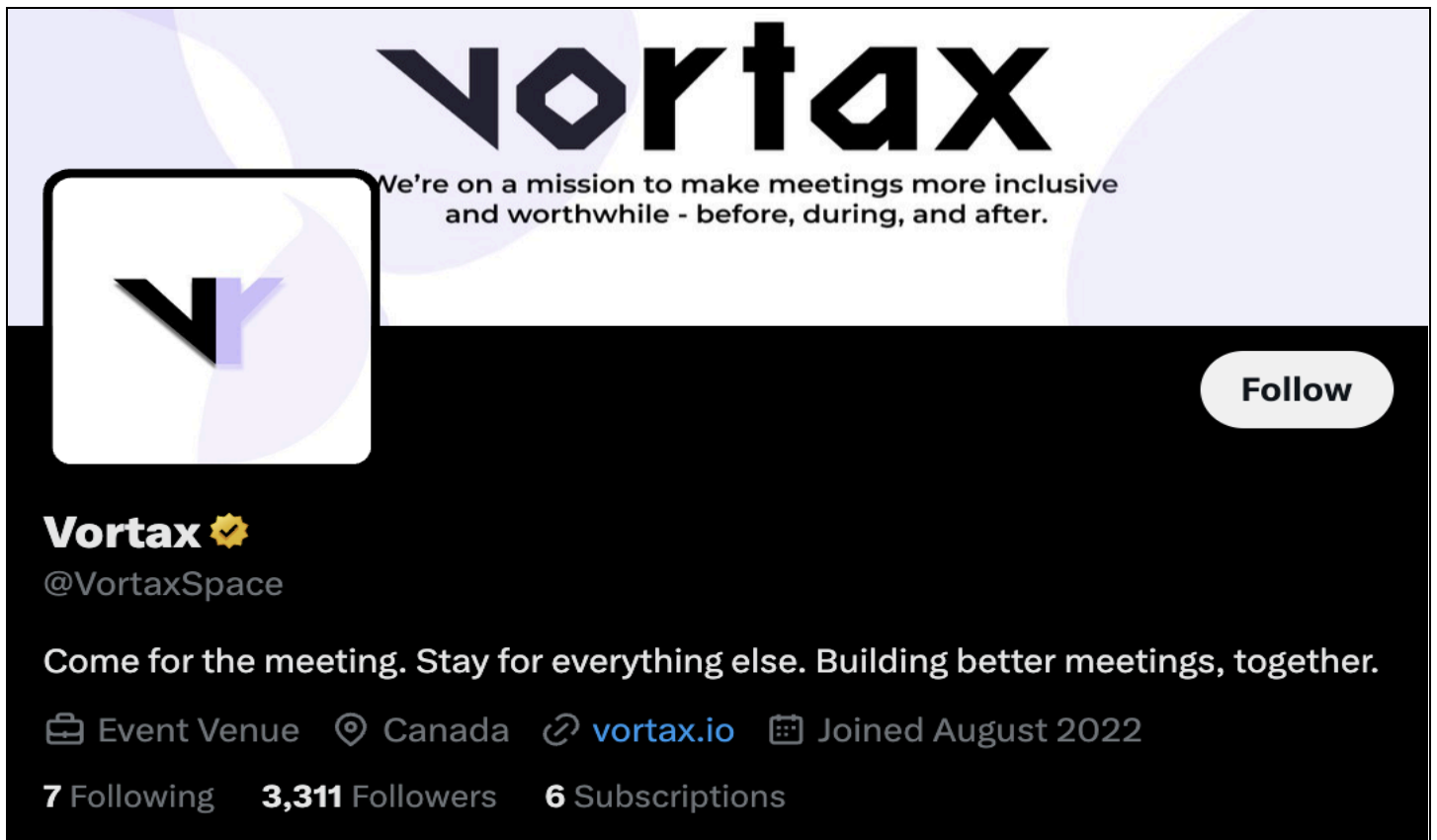
- Insikt Group identified a malicious application on social media called Vortex that is connected to multiple ongoing scams targeting macOS users. The campaign detailed in this report has connections to a campaign previously reported by Insikt Group (“[Cybercriminal Campaign Spreads Infostealers, Highlighting Risks to Web3 Gaming](#)”), suggesting that the same threat actor operates both campaigns. This also suggests that the threat actor has broadened the scope of its operations and expanded its targeting beyond Web3 gaming to masquerading as virtual meeting applications that primarily target cryptocurrency users.
- The threat actor that operates this campaign, identified as markopolo, leverages shared hosting and C2 infrastructure for all of the builds (**Table 4**) identified in this report. This suggests that the threat actor relies on convenience to enable an agile campaign, quickly abandoning scams once they are detected or producing diminishing returns, and pivoting to new lures.
- This scaled campaign is likely indicative of a widespread credential harvesting operation, which could imply that markopolo acts as an initial access broker (IAB) or “log vendor” on a dark web shop, such as Russian Market or 2easy Shop; however, we have no evidence to make that assessment, as of this writing.

## Threat Analysis

Vortex is a self-proclaimed virtual meeting software — marketed as a cross-platform and in-browser enterprise-focused alternative to other video chat services — that leverages artificial intelligence to generate meeting summaries and action items and suggest questions or comments with its “MeetingGPT” product. Vortex is indexed by all major search engines and is primarily active on social media (@VortexSpace), but also maintains a Medium blog ([medium\[.\]com/@vortex](#)) with approximately 22 suspected AI-generated articles published between December 7, 2023, and December 16, 2023. Vortex claims to operate out of a physical office (1100 King Street West, Toronto, Ontario, Canada), which is actually the physical address of an apartment building. Vortex claims to have received awards from technology publications (such as *Forbes*) and boasts endorsements from Fortune 500 companies

(such as Uber), but there is no evidence to corroborate such claims. At first glance, Vortax appears to be a legitimate software company; however, upon deeper investigation, every aspect of its “brand” is misleading. This includes its official websites — *vortax[.]io* and the now-suspended *vortax[.]space* — which are rife with spelling and grammatical errors (for example, “Comming Soon”).

Vortax perpetuates the spread of infostealer malware via phishing on social media. While Vortax advertises applications for Windows, Linux, macOS, iOS, and Android on its website, users cannot actually download said applications without a “Room ID”. Room IDs function as meeting invitations and are spread in targeted replies and direct messages (DMs) sent from social media accounts likely controlled by Vortax’s threat actors. These replies and DMs are in response to cryptocurrency-related topics, which implies that a primary goal of this campaign is cryptocurrency theft.



**Figure 1:** Vortax account on social media; the checkmark icon indicates that Vortax is designated as a “Verified Organization” on the platform (Source: Recorded Future)

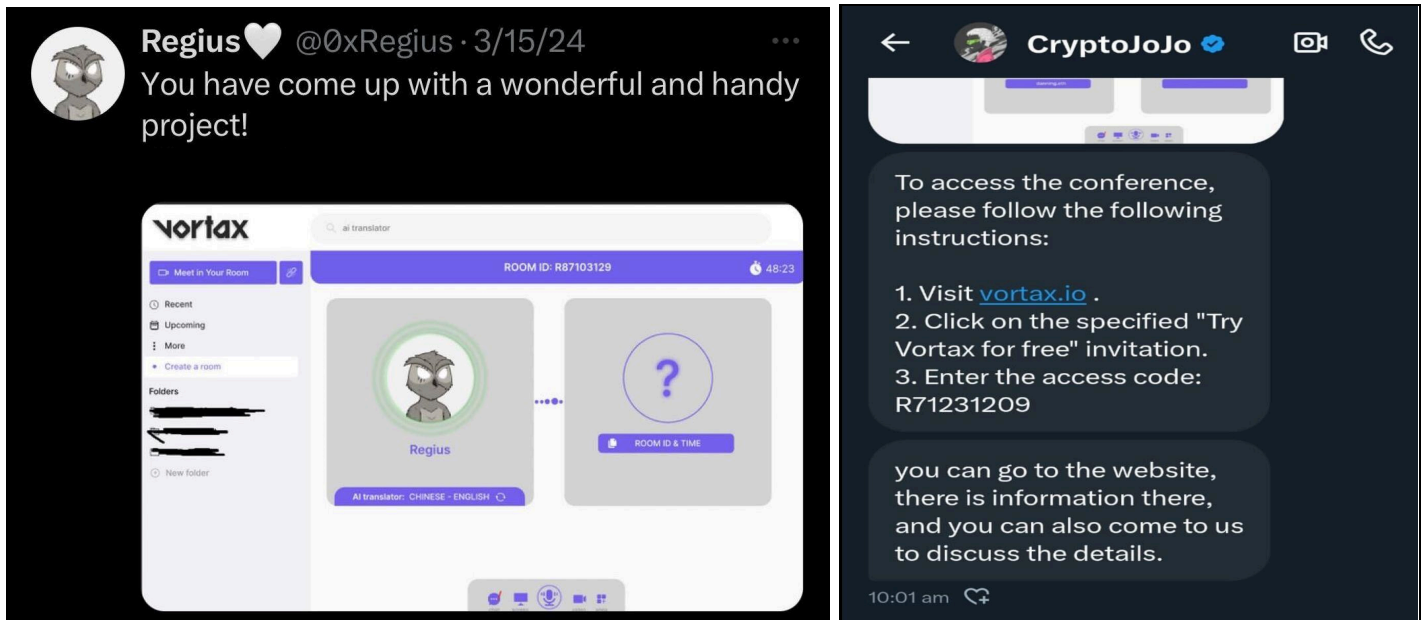
Domain	ASN	First Seen	Last Seen	Status
vortex[.]io	AS-REG, RU (AS197695)	2024-03-01	2024-05-15	Vortex homepage
vortex[.]app	AS-REG, RU (AS197695)	2023-12-17	2024-05-15	Vortex homepage
vortex[.]org	AS-REG, RU (AS197695)	2023-02-14	2024-05-15	Parked domain, no content
vortex[.]space	AS-REG, RU (AS197695)	2024-01-04	2024-05-15	Domain suspended as of May 15, 2024

**Table 1:** Vortex hosting information (Source: Recorded Future)

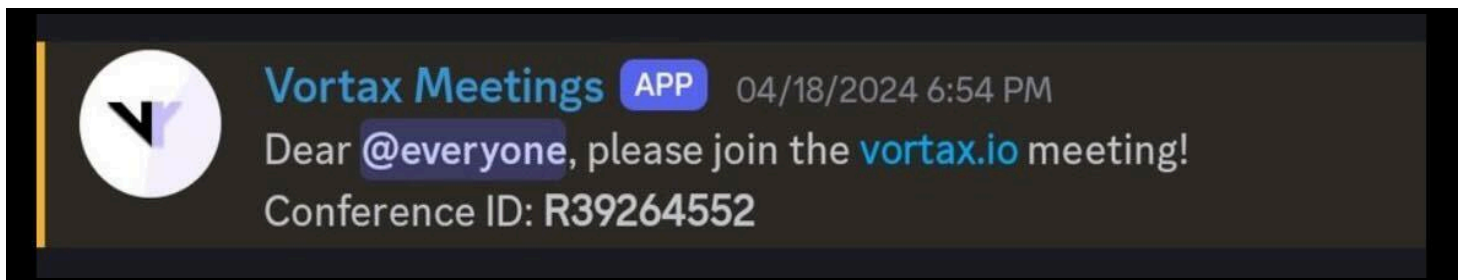
Accounts associated with Vortex have four primary methods for sharing Room IDs, which lead to infostealer infections:

- Replies to the Vortex account on social media
- Direct messages on social media
- Posting in cryptocurrency-related Telegram channels
- Posting in cryptocurrency-themed Discord channels

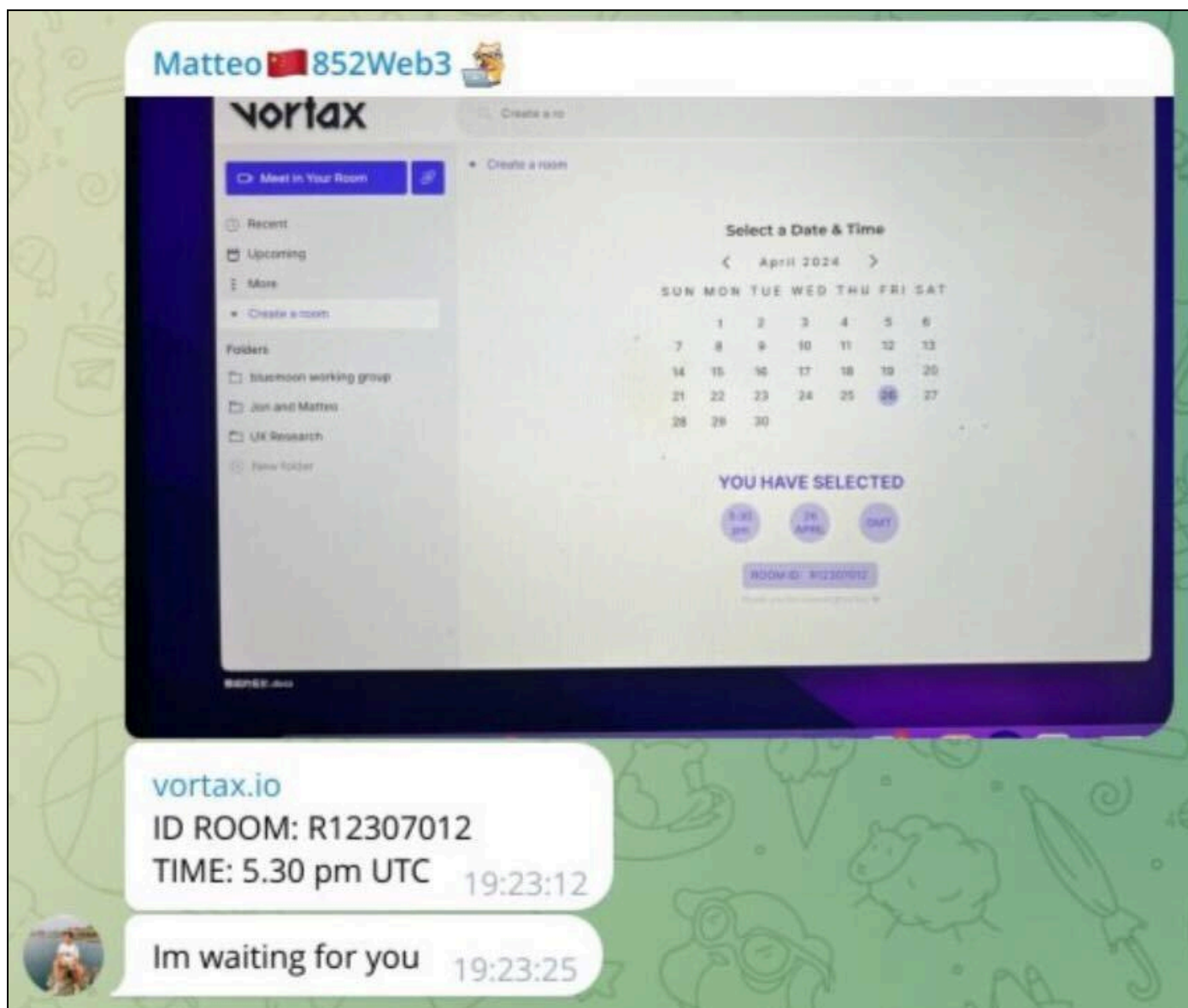
There is overlap in naming, profile pictures, content, and shared Room IDs between the accounts that reply to the Vortex social media account and those active on other sources, indicating that these accounts are likely connected and operated by Vortex's operators.



**Figure 2:** Social media account sharing a Room ID in the replies of a Vortex post (Left); Social media account sending a direct message to a cryptocurrency-related account with a different Room ID (Right) (Source: Recorded Future)



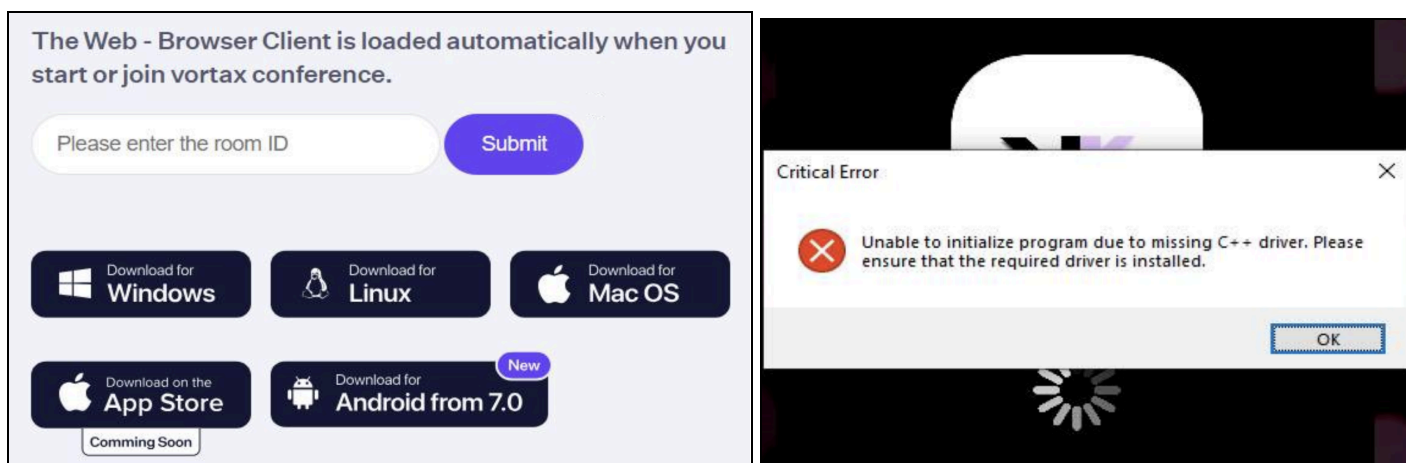
**Figure 3:** Automated "Vortex Meetings" application on Discord sharing a unique Room ID (Source: Recorded Future)



**Figure 4:** Account on Telegram sharing a unique Room ID in a cryptocurrency-related public channel (Source: Recorded Future)

The most common Room IDs identified by Insikt Group were R12307012, R39264552, R87103129, and R71231209. All of the Room IDs, when entered into the Vortex website, redirect the user to a Dropbox link (Windows) or external website (*plumbonwater[.]com*) (macOS) that downloads the Vortex installer. Upon entering the Room ID, if one of the above codes is entered incorrectly, or is invalid, the following response occurs:

- The page runs a PHP script located at "hxtps://vortex[.]io/assets/php-back/check-code.php"
- The script returns the response "\u041a\u043e\u0434 \u043d\u0435 \u043d\u0430\u0439\u0434\u0435\u043d\u043e"
- This response decodes to "Код не найдено" ("Code not found")



**Figure 5:** Vortex download prompt, which requires the user to input a Room ID to download the software (Left); Vortex client claiming that it experienced a “critical error” related to a “missing C++ driver” (Right) (Source: Recorded Future)

According to Recorded Future Malware Intelligence, behavioral analysis of the Vortex installers on Windows and macOS indicates that `Vortex App Setup.exe` and `VortexSetup.dmg` deliver Rhadamanthys and Stealc, or AMOS, respectively (**Table 2**). As seen in **Figure 5**, the Vortex installer on Windows and macOS never actually launches the purported Vortex application, claiming that it encounters critical errors that impede it from running; however, in the background, Vortex is running many malicious processes.

Filename	Size	Malware Tags	SHA256 Hash
Vortex App Setup.exe	47.3 MB	Rhadamanthys, Stealc	<a href="#">f3176e0859ba92049dcd57685c1b5f49b97183ff49fcc79f2ce4ad2b31d2d843</a>
VortexSetup.dmg	498 KB	AMOS	<a href="#">c34f8b6a299dd867a8d00b4fc50d91d9fdd4aa36f7c2a444aab4601dd4238e1</a>

**Table 2:** Malicious Vortex installers on Windows and macOS (Source: Recorded Future)

The Windows executable for the Vortex installer is hosted at `www[.]dropbox[.]com/scl/fi/3jknhxkr2kwqfrw8l0ccc/Vortex-App-Setup.exe?rlkey=xv1alsdjdvuac1bp4643ry6iz&st=ck9api5p&dl=1`. As shown in **Table 3**, the macOS version of the Vortex installer is hosted on a separate external link.



Domain	IP Address	ASN	Note
plumbonwater[.]com	79.137.197[.]159	AEZA-AS, GB (AS210644)	Hosts and communicates with VortexSetup.dmg
showpiecekennelmating[.]com	185.193.126[.]25	CYBERDYNE, LR (AS37560)	Communicates with Vortex App Setup.exe following download from Dropbox

**Table 3:** Vortex installer infrastructure (Source: Recorded Future)

After installing Vortex, the Windows version of the application communicates with *showpiecekennelmating[.]com* before connecting to a likely C2 server — *89.105.198[.]134*. This IP address hosts *casino-legrand[.]info*, which resolves to a FASTPANEL administrative panel login, as of May 3, 2024. This panel is likely controlled by markopolo. The macOS version of Vortex communicates with *193.233.132[.]137*, which is likely an AMOS C2. While the AMOS C2 is based in Moscow, Russia, it uses a different hosting provider (SUNHOST-AS, GB; AS216319) than observed in previous AMOS campaigns (SERVER4-AS, RU; AS210352). We assess that AMOS’s operators may have moved on from primarily leveraging SERVER4-AS.

Using Recorded Future Malware Intelligence, Insikt Group was able to identify connections between the AMOS build associated with Vortex and a previous AMOS campaign targeting Web3 gaming projects; the latter is detailed in the public Insikt Group report “[Cybercriminal Campaign Spreads Infostealers, Highlighting Risks to Web3 Gaming](#)”. The BuildIDs associated with two of the fraudulent Web3 projects in the previous campaign, Astration (*astration*) and Dustfighter (*dust*), are associated with the user “markopolo”. This user is attributed to the BuildID of Vortex (*vor*) (**Figure 6**).

```

HTML Form URL Encoded: application/x-www-form-urlencoded
  Form item: "BuildID" = "vor"
    Key: BuildID
    Value: vor
  Form item: "user" = "markopolo"
    Key: user
    Value: markopolo
  [truncated] Form item: "B64" = "UESDBAoAAAAAN2LoVgAAAAAAAAAAAAAAAAAKABAAMzY0NTU1NDAXL1VYDADB3jJmwt4yZvYBFABQSwME
    Key: B64
    Value [truncated]: UESDBAoAAAAAN2LoVgAAAAAAAAAAAAAAAAAKABAAMzY0NTU1NDAXL1VYDADB3jJmwt4yZvYBFABQSwME

HTML Form URL Encoded: application/x-www-form-urlencoded
  Form item: "BuildID" = "astration"
    Key: BuildID
    Value: astration
  Form item: "user" = "markopolo"
    Key: user
    Value: markopolo
  [truncated] Form item: "B64" = "UESDBAoAAAAAHCFt1gAAAAAAAAAAAAAAAAALABAAMTg4MjM3NDk3My9VWAwAo930ZaPdzmX2ARQAUEst
    Key: B64
    Value [truncated]: UESDBAoAAAAAHCFt1gAAAAAAAAAAAAAAAAALABAAMTg4MjM3NDk3My9VWAwAo930ZaPdzmX2ARQAUEst

```

```

HTML Form URL Encoded: application/x-www-form-urlencoded
  Form item: "BuildID" = "dust"
    Key: BuildID
    Value: dust
  Form item: "user" = "markopolo"
    Key: user
    Value: markopolo
  [truncated]Form item: "B64" = "UEsDBAoAAAAAM05XFgAAAAAAAAAAAAAAAAALABAAMTYyOTE1MTk5NC9VNAwAvi7gZb4u40
    Key: B64
    Value [truncated]: UEsDBAoAAAAAM05XFgAAAAAAAAAAAAAAAAALABAAMTYyOTE1MTk5NC9VNAwAvi7gZb4u4GX2ARQAUEsC
    
```

**Figure 6:** Evidence indicating that the AMOS user markopolo is affiliated with the Vortex campaign, as well as the previously identified Astration and Dustfighter campaign (Source: Recorded Future)

Further investigation of the Vortex staging domain *plumbonwater[.]com* (Table 3) revealed 23 additional domains hosted on the same IP address (79.137.197[.]159). Using Recorded Future Malware Intelligence, Insikt Group identified that each of these domains hosts a malicious application that delivers AMOS. Investigation into these malicious applications unearthed additional scams — similar to Vortex, described above — that masquerade as legitimate companies and leverage social media and messaging platforms to target cryptocurrency users. These scams, such as VDeck and Mindspeak, share crossover with the Vortex brand and are likely operated by the same threat actor — markopolo.

Investigation into the UserIDs associated with each AMOS build identified in this network shows that all of them are affiliated with the markopolo user, identified in previous Insikt Group investigations and shown in Figure 6.

Table 4 provides a complete list of malicious applications, their file names and BuildIDs, and links to Recorded Future Malware Intelligence. None of the domains below have been previously reported.

Domain	Filename	BuildID	SHA256
plumbonwater[.]com	VortexSetup.dmg	vor	<a href="#">c34f8b6a299dd867a8d00b4fc50d91d9fdde4aa36f7c2a444aab4601dd4238e1</a>
weworkhappy[.]com	VDeckSetup.dmg	cloregod	<a href="#">b1817f23b4b0b09cd7db9e90eac166ddf0de9d22aaf69f17308da43854604d9e</a>
marylandhomerates[.]com	Installer.dmg	meowsup	<a href="#">5d45cc81a22e6ba596b12db4baec5b20ccbe9ce52f8258fa5690da0e5ef2a982</a>
novatercaagilidade[.]com	ZoomInstaller.dmg	private1	<a href="#">bde29a5215e685805f00fee5f03de3478f8214195ecf93fb81562bcd6122149d</a>

123mlhasbrasil[.]com	Launcher.dmg	wioland	<a href="https://www.recordedfuture.com/indicators/f9785743539dfb2199b53be57f86d5dba5c0cd3dfad1130de1532f92e0c7c4f">f9785743539dfb2199b53be57f86d5dba5c0cd3dfad1130de1532f92e0c7c4f</a>
garagemfinity[.]com	Installer.dmg	xmas	N/A; down as of May 15, 2024.
institutoangelabatista[.]com	SpectraLauncher.dmg	DoraLands2	<a href="https://www.recordedfuture.com/indicators/856979042a3c1f61050cc08e8f11856dc714ec16969bd0fc562fd47c9e6c8e4c">856979042a3c1f61050cc08e8f11856dc714ec16969bd0fc562fd47c9e6c8e4c</a>
betbhaibetting[.]com	PartyLauncher.dmg	meowparty	<a href="https://www.recordedfuture.com/indicators/be7e5707e5e399aedcfb2800d7039ff050500be3bafd217ca9200abed8bef03f">be7e5707e5e399aedcfb2800d7039ff050500be3bafd217ca9200abed8bef03f</a>
ebolight[.]com	Setup.dmg	RobinL	<a href="https://www.recordedfuture.com/indicators/750baf928763a60343f8d48e45c4a4ca8da1243add410821b51484242571d089">750baf928763a60343f8d48e45c4a4ca8da1243add410821b51484242571d089</a>
aidigibrain[.]com	Launcher.dmg	meowparty	<a href="https://www.recordedfuture.com/indicators/8fb5de2498e48338825253f9d165986403661003393278d93cb35f5f9a1549dc">8fb5de2498e48338825253f9d165986403661003393278d93cb35f5f9a1549dc</a>
repairleatherla[.]com	Setup.dmg	lumary	<a href="https://www.recordedfuture.com/indicators/05219c02d66daad246eab2abccc35384c34f17ce1daa2fee21cf0bfee88e31b2">05219c02d66daad246eab2abccc35384c34f17ce1daa2fee21cf0bfee88e31b2</a>
msjessd[.]com	Installer.dmg	RobinL	<a href="https://www.recordedfuture.com/indicators/5d6075e33a168dfa44492dbec5462c6142399b708ec0d038e3e1869141e6b378">5d6075e33a168dfa44492dbec5462c6142399b708ec0d038e3e1869141e6b378</a>
iuddy[.]com	Setup.dmg	vexor	<a href="https://www.recordedfuture.com/indicators/9f676511cb9b35e2916ebf79aec6b4aa6514f8bf640ea2fe786d16a7ed8dab7b">9f676511cb9b35e2916ebf79aec6b4aa6514f8bf640ea2fe786d16a7ed8dab7b</a>
indianahomerates[.]com	WorldLauncher.dmg	private	<a href="https://www.recordedfuture.com/indicators/93463142e354b05bbac20b9e9498ee5f8c9ea2488151ee6870189baab0b7e2ff">93463142e354b05bbac20b9e9498ee5f8c9ea2488151ee6870189baab0b7e2ff</a>
pegamente[.]com	Setup.dmg	ELHA	<a href="https://www.recordedfuture.com/indicators/922afb7de0159e7b435290868c51f33c59e0990ec964f77de9201534e4232117">922afb7de0159e7b435290868c51f33c59e0990ec964f77de9201534e4232117</a>
nongduangmarket[.]com	WorldLauncher.dmg	private	<a href="https://www.recordedfuture.com/indicators/4b35a3872589f44c43469cf73c54b525506f6cc894598d109c5f931923c6eba9">4b35a3872589f44c43469cf73c54b525506f6cc894598d109c5f931923c6eba9</a>

crosstacks[.]com	Launcher.dmg	dust	<a href="https://www.recordedfuture.com/buildid/8e6176eaea919bae5b75000244474d8310a7b8d59806fca133d78f5343839d76">8e6176eaea919bae5b75000244474d8310a7b8d59806fca133d78f5343839d76</a>
tripleplay-arg1[.]com	Setup.dmg	FriendsCompany	<a href="https://www.recordedfuture.com/buildid/9e5dc9028d4a404bf3d7aa412c58cfe8ece0da23c4f3f338e05b34198d9c1afe">9e5dc9028d4a404bf3d7aa412c58cfe8ece0da23c4f3f338e05b34198d9c1afe</a>
xhaxo[.]com	Setup.dmg	FriendsCompany	<a href="https://www.recordedfuture.com/buildid/7225d5fde4daa4552daf67a0ac2f6d7ec0e768536c5377ee3e7beaa04603a6f5">7225d5fde4daa4552daf67a0ac2f6d7ec0e768536c5377ee3e7beaa04603a6f5</a>
assetsreserve[.]com	NortexApp.dmg	sneprivate	<a href="https://www.recordedfuture.com/buildid/7f6f85e1ae4186edc9bf821943893b183a6a9252b0899d682c1899201dffca496">7f6f85e1ae4186edc9bf821943893b183a6a9252b0899d682c1899201dffca496</a>
eliteneatproductshop[.]com	Launcher.dmg	xmas	<a href="https://www.recordedfuture.com/buildid/73c099168755acbc793675a5e64ca719f909cd1943db5757af96b2c1c79ae6d8">73c099168755acbc793675a5e64ca719f909cd1943db5757af96b2c1c79ae6d8</a>
piloje[.]com	Installer.dmg	heard	<a href="https://www.recordedfuture.com/buildid/eb74c9dd0a0e3ea3cb31338c55e9e630fdee964a7b5967efcdfa8daa26a0f129">eb74c9dd0a0e3ea3cb31338c55e9e630fdee964a7b5967efcdfa8daa26a0f129</a>
faruinnovations[.]com	NightVerseSetup.dmg	NIGHT	<a href="https://www.recordedfuture.com/buildid/dee705f4a513081afe9ab682b832068ac558ad3145038e57edc8109ab0e80769">dee705f4a513081afe9ab682b832068ac558ad3145038e57edc8109ab0e80769</a>

**Table 4:** Malicious applications that deliver AMOS and are associated with the Vortex campaign and tied to markopolo (Source: Recorded Future)

All of the AMOS builds in **Table 4** are unique, previously unreported, and associated with the markopolo user. BuildIDs that we found to be duplicative, in this and previous campaigns, include `xmas`, `dust`, `meowparty`, and `RobinL`.

Analysis of the above domains also unearthed additional infrastructure associated with AMOS. Many of the above AMOS builds make POST `/joinsystem` requests to previously unreported AMOS C2s, including `77.221.151[.]54` — as opposed to `193.233.132[.]137`, described earlier in this report. This research also discovered additional likely staging domains for future AMOS builds at `shinudating[.]com`, `cheapcleanprotein[.]com`, `deskpaysal.com`, `crosscertify.com`, and `hobbyplanners[.]com`, all of which are currently parked (registered but not currently in use).

## Mitigations

- Ensure that your organization-wide detections for AMOS are regularly updated and tested, based on the IoCs linked in **Appendix A**, to prevent infections related to this campaign. AMOS has gone through several development cycles since its inception and requires defenders to regularly update signatures associated with its various versions and builds.
- Advise users on the risks associated with downloading third-party virtual meeting software, like Vortax, that is not approved by your organization. Consider implementing strict security controls to prevent users from downloading unlicensed “open-source” or “freemium” software that they may have seen on social media, messaging platforms, or search engines.
- Encourage users to report suspicious activity on social media, messaging platforms, email, and other mediums that engage in the behavior described in this report. Educate your users on risks associated with cryptocurrency theft and how scams proliferate on social media.
- Recorded Future clients can use Recorded Future Malware Intelligence to identify and mitigate the threats identified in this report. Recorded Future Malware Intelligence will provide behavioral analysis of malicious macOS applications that may uncover connections to AMOS C2 infrastructure.
- Recorded Future Malware Intelligence, paired with Recorded Future Network Intelligence, can help identify malicious domains and IP addresses that host, stage, or communicate with the various builds of AMOS identified above.
- As this campaign’s primary focus was on impersonating enterprise-level software, it is important to monitor your own technology stack via the curation of bespoke tech stack watch lists in the Recorded Future Intelligence Cloud. Leveraging these lists, in tandem with the Recorded Future Threat Map, Recorded Future Vulnerability Intelligence, and Recorded Future Attack Surface Intelligence, will provide unparalleled visibility into infostealer threats that may affect your organization.
- As the primary focus of this report was on infostealer malware, we also recommend exploring Recorded Future Identity Intelligence and Recorded Future Brand Intelligence, which will provide affected organizations with visibility into credentials found in AMOS infostealer logs, database breaches, and combo lists that may result from credential compromises related to this campaign.
- Stay abreast of developments related to AMOS in open sources (such as vendor reporting and social media, among others), dark web and special-access sources, and messaging platforms by using Recorded Future Threat Intelligence, Recorded Future AI, and the Recorded Future Advanced Query Builder (AQB).

## Outlook

The expansive nature of this campaign, illuminated by examining a single scam on social media (Vortax), demonstrates the wide-ranging nature of infostealer campaigns and the difficulty of tracking them. We assess that the indicators in this report will provide further avenues for research into the markopolo user, the behavior of AMOS, and the patterns employed by AMOS operators to commit scams at scale.

This campaign, paired with the Web3 campaign previously described, may serve as a model for other cybercriminals seeking to proliferate macOS malware widely. In particular, the use of generative AI to create the appearance of a legitimate company will likely continue to be a tactic, making this social engineering tactic more effective. We assess that, given the increase in macOS malware and exploit kits advertised on the dark web over the past two years, the techniques described in this report will become more widely employed by others seeking to exploit macOS, which has remained relatively resilient to malware, compared to Windows. Organizations must consider macOS as no longer “safe” from malware, contrary to popular perception, and therefore must factor this into their risk posture, technology stack, and passive defenses.

## Appendix A — Indicators of Compromise

**Domains:**

vortax[.]io  
vortax[.]space  
vortax[.]app  
vortax[.]org  
plumbonwater[.]com  
showpiecekennelmating[.]com  
casino-legrand[.]info  
weworkhappy[.]com  
marylandhomerates[.]com  
novatercaagilidade[.]com  
123mllhasbrasil[.]com  
garagemfinty[.]com  
institutoangelabatista[.]com  
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79.137.197[.]159  
89.105.198[.]134  
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