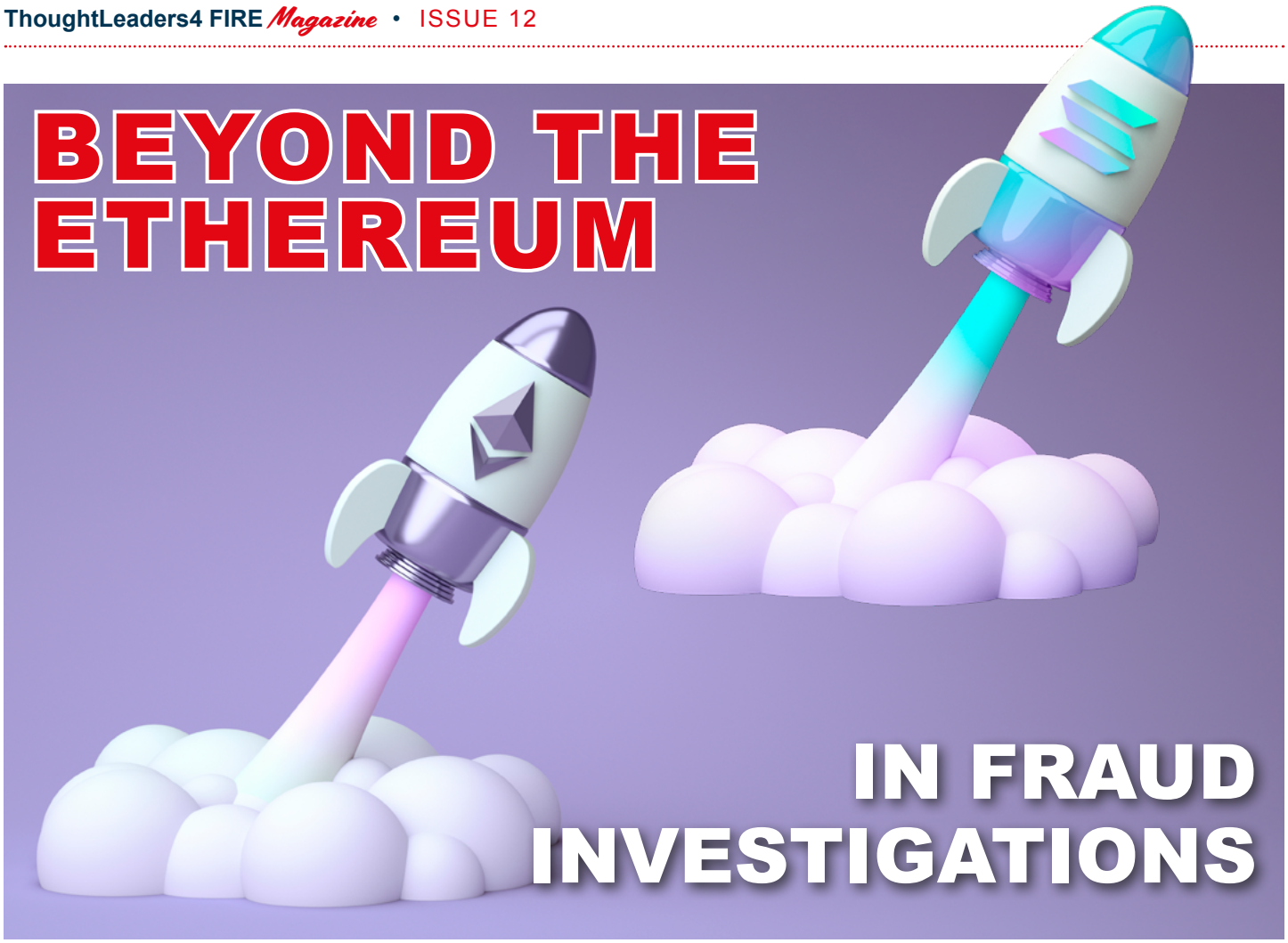

Authored by: Stella Ko (Training Specialist) - Chainalysis

As fraud investigators develop their crypto investigation capabilities, they generally start with Bitcoin, likely because it was the first cryptocurrency with the largest market cap.

The next stop on their journey is often Ethereum, which has the second-largest market cap of all cryptocurrencies.

The Ethereum Merge[1] in 2022 was a massive milestone for crypto: a $200 billion network ported over to an entirely new, scalable transaction ledger with a brand new security model.

But what might lay beyond Ethereum for FIRE starters who will be the key players in the blockchain ecosystem as the next generation and will be faced with investigations in more novel tokens?

Let us introduce Solana, which is relatively new to the DeFi ecosystem compared to Ethereum but is catching up quickly. Solana enables buyers to purchase NFTs with fewer congestion problems and almost no transaction fees.

Its origin story is suggested by its name, which comes from a small beach town North of San Diego called Solana Beach, where Anatoly Yakovenko, who wrote the Solana white paper[2], lived and surfed for three years when he worked for Qualcomm.

One catalyst in Solana gaining traction occurred in September 2020 when the popular stablecoin Tether announced the availability of USDT on the Solana blockchain. Tether was already a well-known asset with the third highest ranked market cap. Just a few months later in January 2021, Circle released USDC, another popular stablecoin, on Solana.

In addition to the above boosts to its reputation, Solana's usefulness when it comes to NFTs has assisted in its rapid growth.

Solana's NFT 24-hour trading volume has at times outperformed Ethereum's NFT trading volume for the same period.

On 26 May 2022, Solana NFT secondary market 24 hours total sales generated nearly $24.3 million, while Ethereum sales added up to $24 million across all of the marketplaces it tracks.

There are two factors which have been game changers for Solana.

1 https://blog.chainalysis.com/reports/ethereum-merge/
2 https://solana.com/solana-whitepaper.pdf

The first is fees. Nobody likes to pay transaction fees and Solana is well known for keeping these low. In simple terms, on Ethereum, if you were sending $100 in a transaction, depending on the network conditions at that time, it may cost you $50 making it incredibly expensive, while it costs around a cent on Solana.

The second is speed. Solana is one of the fastest blockchains in transaction processing thanks to its unique network architecture. It's possible to consider this at a very high level but we give a bit more depth in brackets for those who want some more technical insight.

Ethereum prioritized decentralization, while Solana focused on throughput which reduced transaction time (through speedier transaction-block verification). However, benefits for legitimate users benefit criminal users too.

Indeed, according to Chainalysis findings, services on Solana suffered some of the largest DeFi hacks in 2022 ($320m Wormhole[3], $100m Mango, $8.7m Crema Finance).

It follows that investigators in asset recovery, auditors, and insolvency practitioners will inevitably need to navigate a Solana investigation.

Criminals can send proceeds far more quickly, through many more transactions at a lower overall cost. Multiple transactions are often structured in a way that makes it much harder for investigators to follow via traditional blockchain explorers or tooling which don't account for the unique multi-level account structure and ownership-transfer mechanisms of Solana wallets. The next two paragraphs look at this from a technical perspective but we then use an example to illustrate less technically.

Solana uses proof of history (POH), which differs from Ethereum. In Solana, determining the encryption time between two events requires a series of computational steps. You can track the order of each transaction by adding a timestamp to the transaction. This timestamp allows 'fast sequencing validators,' which know their order without having to communicate back and forth.

In contrast, on the Ethereum blockchain, every node has to communicate until they all agree on time and this agreement should be done before submitting the block, preventing a speedier process.

To explain why ownership changes in Solana make it harder for investigators to track, let's take an example. Imagine:

- **You send 10 ETH to A.**
- **A sends the same amount of ETH to B.**

Block explorers show the ownership change from You to A to B i.e. the funds from your address move to A's address, then to B's address. This can be done manually; here the usefulness of blockchain analytics tools is more to help with understanding which entities funds can be tracked to and from (mapping real-world entities to addresses) and associated risks.

While the same method can be used for sending funds on Solana, there is another option where you can simply change the ownership of an account rather than moving funds at all. As a result investigators have a risk of incorrectly mapping historical transfers to the current owner, not to the person who owned the account at the time of the transfers. It might look like I sent the money to B, when actually I sent it to A, who changed ownership of that account to B. In other words, you can't properly trace historical criminals associated with the transaction. This leads to false investigative conclusions and risk calculations.

Of course, it's unrealistic to expect investigators in professional service firms to trace funds manually in that scenario. Therefore analysis tools need to evolve to cover the arguably more sophisticated nature of the Solana blockchain.

This is not to say the entire blockchain should be dismissed due to these attacks and complexities. As with every other popular currency, criminal activity is unavoidable for example in traditional finance we recently witnessed 'millions of dollars disappear[4]' from Olympic legend Usain Bolt's investment account. It is important that lawyers and financial investigators can handle each case regardless of the underlying currency stolen/used and continue to develop their technical knowledge and to have the right tools at their disposal.

The tech in this area exists and is improving and investigation experts, such as FIRE starters have the tools they need to build the skills required to support innovation, disrupt crime, and build trust.

3 https://blog.chainalysis.com/reports/wormhole-hack-february-2022/

4 https://www.mirror.co.uk/sport/other-sports/athletics/usain-bolt-millions-dollars-olympics-28950204