A Solana blackout – uptime and digital assets

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On 14 September the Solana network went down. It did not come back online for 18 hours. In crypto-land this is an eternity. It is also a reminder of the need to assess and consider technical maturity as well as network resilience when making digital asset investment allocation decisions. Both of these dimensions are critical differentiating factors and also major determinants of the long-term sustainability of different digital assets.

Prior to September, Solana was having a great 2021. Starting the year with a price of USD$1.50 its SOL coin found itself peaking at USD$213 on 2 September. Solana was first conceptualized by Anatoly Yakovenko in 2017[1], and its code was not released publicly until 2019, which makes it a relative newcomer in the digital asset space. Solana allows people to write and run smart contracts on its network, in a similar way to Ethereum. An ecosystem of companies and projects has emerged around Solana – as it has grown so too has demand for the SOL coin.

Then on 14 September, the network stopped…

For digital services, like Cloud hosting, uptime is an essential requirement. Guarantees are typically pegged just below 100% uptime[2] and even services like AWS or Microsoft Azure have trouble meeting this exacting standard[3]. In crypto, uptime is just as essential. For instance, Bitcoin has run at 99.98% uptime over more than a decade[4]. This is an impressive achievement for a completely open source and decentralised network – and is sometimes taken for granted.

In terms of historical crypto outage times the Solana incident was one of the worst. A concerning aspect of the Solana outage, beyond length, was that it involved the failure of the network itself. In simple terms, too many transactions were sent to the network at a point in time. The network could not process this volume of transactions and failed.

The Solana network was designed in a way that processes more transactions in less time than similar networks like Ethereum. For Solana to process so many transactions it requires larger storage per block, which in turn makes purchasing than maintaining a node on the network a more expensive affair. This limits the number of people who can create nodes, which leads to a more centralised network relative to alternatives with smaller blocks.

This points to the reality of design tradeoffs, which may not be obvious to non-technical people. It is all very well to design a system that can process lots and lots of transactions. However, this design decision has consequences on the short-term operation and potentially long-term sustainability of the network. Both can have ramifications on coin/token/etc price.

The Solana incident points to another sometimes neglected dimension of crypto network valuation: code and development maturity. The (open source) code for crypto networks needs to be written by expert developers in a similar way to that which mission critical systems are written (e.g. space shuttles, fighter jets, nuclear reactors). This is because so much is at stake in the event of network failure. Put simply, the code must run exactly as intended every single time with zero downtime.

For Solana to have failed the way it did is a reflection of the relative immaturity of the code base of the network. Networks that have been in operation for a shorter amount of time tend to have a higher probability of technical failure. This is partly because the network hasn't been subject to the adversarial environment that characterises the crypto space – one where attackers can reap an outsized payoff from successfully finding and exploiting technical vulnerabilities. It takes time to find and fix vulnerabilities in software code.

Finally, the way in which Solana was brought back online is worth noting. There are somewhere around 600 Mainnet Solana Validator nodes (compared to >10,000 Bitcoin nodes). A supermajority (80%) of these nodes had to install a patch/update before the Solana network could be rebooted. That the Solana network itself could fail in such a way, and require the drastic measure of an entire network reboot, points to a lack of resilience that comes from this degree of node/network centralisation.

Going forward, the Solana incident was not the end of the network. Indeed, it is just the start for Solana. Lessons will be learned, code improvements made, and users of the network chastened lest they become too reliant on the network for 100% uptime. The security, code maturity and degree of network (de)centralisation are not always dimensions considered by investors when taking on exposure to different digital assets. These dimensions vary across different digital assets and need to be measured so as to be taken into account. The Solana incident is a reminder that they need to be.

[1] https://www.kraken.com/en-us/learn/what-is-solana-sol

[2] https://aws.amazon.com/compute/sla/

[3] https://aws.amazon.com/compute/sla/

[4] https://www.buybitcoinworldwide.com/bitcoin-uptime/

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