



CDCSOL White Paper

Version 1.0

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1. Executive Summary

Staking SOL on Solana offers significant benefits for holders and the network alike. However, traditional staking methods present substantial limitations, such as losing liquidity on the locked assets and lengthy wait times to unstake SOL.

This whitepaper introduces **Crypto.com Staked SOL (CDCSOL)**, an enterprise-grade liquid staking protocol offered by Crypto.com. CDCSOL provides an instant, efficient, and liquid way of participating in the Proof of Stake consensus mechanism on Solana to maintain the integrity of the network.

By accessing our on-chain staking service in the Crypto.com App or on the Crypto.com Exchange, users in select jurisdictions can convert their staked SOL to CDCSOL, which can be used in external decentralized finance (DeFi) applications. Requests to unwrap CDCSOL can be made anytime.

The launch of CDCSOL furthers our mission to accelerate the world's transition to cryptocurrency as we continue introducing innovative and regulated services to our users.

2. The Case for Liquid Staking

2.1 What is Proof of Stake?

Solana's Proof of Stake consensus mechanism is essential for maintaining the integrity of the network. The Solana Foundation provides the following overview¹:

“Validators play a key role in maintaining and securing the Solana blockchain. Validators are responsible for processing new incoming transactions on the network, as well as for voting on and appending new blocks to the blockchain. [...] Every validator on the network has an opportunity to participate in consensus by casting votes for which blocks they believe should be added to the blockchain, thereby confirming any valid transactions contained in those particular blocks.”

¹ <https://solana.com/staking#what-is-proof-of-stake>

SOL holders can participate in staking by delegating SOL to validators, and receive staking rewards in return.

2.2 Challenges With Traditional Staking

Even though SOL staking benefits both holders and the Solana network, stakers must be aware of two key constraints:

- A. Lack of liquidity:** The utility of staked SOL is drastically diminished as it cannot be transferred or sold throughout the staking process
- B. Entry and exit delays:** When SOL is initially locked with a validator for staking, it enters an activation phase and does not generate rewards until fully activated. The length of this queue can be anywhere from seconds to days, depending on the start of a new staking cycle. Likewise, when SOL is unstaked, it does not generate rewards throughout the process. These periods of inactivity come at a cost to the user, and can significantly dilute the effective staking reward rate.

2.3 Liquid Staking as a Solution

Liquid staking protocols (LSPs) are designed to overcome the limitations of traditional staking methods. When users stake SOL through an LSP, they receive a receipt token that represents the corresponding amount of staked SOL, and any rewards generated from it. These receipt tokens effectively address key constraints by providing users with:

- A. Liquidity:** Users can trade or liquidate their receipt tokens, enabling them to access their funds without waiting to unstake their tokens
- B. Immediate Returns:** Receipt tokens generate returns from staked SOL from the moment of issuance, allowing users to benefit from rewards immediately

With the introduction of CDCSOL, we aim to enhance the user experience by providing a seamless and efficient way to participate in staking while retaining liquidity.

3. Technology

The CDCSOL liquid staking token (LST) represents the underlying staked SOL and all net rewards generated from it. Crypto.com users can easily access the CDCSOL protocol by:

1. Staking SOL through our on-chain staking service
2. Converting staked SOL to a corresponding amount of CDCSOL
3. Redeeming CDCSOL back to staked SOL

Users enjoy flexibility and control over their assets through a user-friendly interface that is available on mobile and the web.

CDCSOL will also be available for purchase on Crypto.com platforms in select jurisdictions, including the Crypto.com App, Crypto.com Exchange, and Crypto.com Onchain, as well as third-party platforms and decentralised applications (dapps) that support CDCSOL. The LST will initially be launched on Cronos chain as a CRC-20 token and subsequently on Solana as an SPL token.

CDCSOL will follow the cToken standard, which allows holders to swap between staked SOL and CDCSOL based on a conversion rate published by the CDCSOL protocol. This rate is designed to ensure an accurate exchange between CDCSOL and the underlying SOL's value. See the '**Conversion Rate**' section for more details.

All net rewards generated on the underlying SOL will be auto-compounded, so users can enjoy compounded rewards.

There is no difference in validator quality regardless of the asset held. The underlying SOL is staked with industry-grade validators that are carefully managed and optimally configured to achieve staking rewards. See '**The CDC Advantage**' section for more details.

Furthermore, CDCSOL will make use of Sanctum, a third-party liquid staking platform built on the Solana blockchain. Sanctum is designed to enhance liquidity and streamline the staking process for users. With Sanctum, users of CDCSOL can potentially make use of the benefits that Sanctum offers:

1. Infinity Pool: Sanctum offers a multi-LST liquidity pool called the Infinity Pool, which accommodates any number of whitelisted LSTs. This structure allows users to deposit

various LSTs or SOL, enhancing the liquidity of CDCSOL via the multi-LST liquidity pool.

2. The Reserve: Holders of CDCSOL may utilize the Sanctum Reserve Pool, which is a pool of idle SOL (non-staked SOL) that accepts staked SOL and returns SOL from the pool in return. At the time of writing, there is over 410,000 SOL within the pool. This can potentially offer users enhanced liquidity by converting CDCSOL back to SOL without incurring a significant amount of slippage on a DEX.

Additionally, CDCSOL will be using the Sanctum SPL 1, a battle-tested and audited stake pool program. Sanctum SPL 1 will have potential to be upgraded to an improved version of the Solana SVSP Program, which is expected to minimize maintenance and rebalancing burden for running a stake pool and its corresponding LST. Sanctum will also be the Stake Pool Manager, who is responsible for creating and managing the pool, setting fees, and maintaining the validator list for the stake pool.

4. Conversion Rate

CDCSOL tokens retain their initial principal value and accrue staking rewards (net of slashing penalties) over time based on a conversion rate published by the CDCSOL protocol. CDCSOL holders can convert between their illiquid staked position and CDCSOL through the specified rate.

The conversion rate is determined by the following ratio:

Total value of SOL managed : Total amount of outstanding CDCSOL tokens issued

The total value of SOL is determined by the following formula²:

(Staked SOL + Rewards Earned) - (Slashing penalties + Staking Fees)

Illustrative example of the conversion rate calculation

Period	1	2	3
Start of period	<u>Protocol state</u> Staked SOL 100 Net SOL rewards 0 CDCSOL outstanding 100 Conversion rate 1 CDCSOL : 1 SOL Calculation: (100+0)/100	<u>Protocol state</u> Staked SOL 200 Net SOL rewards 0 CDCSOL outstanding 200 Conversion rate 1 CDCSOL : 1 SOL Calculation: (200+0)/200	<u>Protocol state</u> Staked SOL 200 Net SOL rewards 12 CDCSOL outstanding 200 Conversion rate 1 CDCSOL : 1.06 SOL Calculation: (200+12)/200
During period	<u>Scenario A: New users join protocol</u> SOL deposited 100 CDCSOL issued 0 Calculation: 100 / 1	<u>Scenario B: Staked SOL accrues rewards</u> SOL rewards accrued 12 CDCSOL issued 0 Calculation: 100 / 1	<u>Scenario A: New users join protocol</u> SOL deposited 100 CDCSOL issued 94.34 Calculation: 100 / 1.06
End of period	<u>Protocol state</u> Staked SOL 200 Net SOL rewards 0 CDCSOL outstanding 200 Conversion rate 1 CDCSOL : 1 SOL Calculation: (200+0)/200	<u>Protocol state</u> Staked SOL 200 Net SOL rewards 12 CDCSOL outstanding 200 Conversion rate 1 CDCSOL : 1.06 SOL Calculation: (200+12)/200	<u>Protocol state</u> Staked SOL 300 Net SOL rewards 12 CDCSOL outstanding 294.34 Conversion rate 1 CDCSOL : 1.06 SOL Calculation: (300+12)/294.34

Note that the protocol-specified conversion rate may differ from the market rate, which results from demand, supply and other factors. The protocol ensures that CDCSOL can always be redeemed at a conversion rate regardless of market rate.

² The CDCSOL protocol is free to use. That said, the underlying Crypto.com SOL staking service is subject to fees.

5. Risks Associated with the Use of CDCSOL

5.1 Sanctum risk

Most LSTs that Sanctum supports use a version of the Solana Programme Library (SPL) stake pool programme, which means CDCSOL and other tokens in the pool experience centralised risk.

To address this, Sanctum's LSTs are held in a multi-signature wallet presided over by 11 members. Despite being a management authority, Sanctum cannot move funds without the signatures of its members, which makes the programme safe even if Sanctum is compromised.

5.2 Smart contract risk

The smooth operation of the CDCSOL protocol is fundamentally dependent on the reliability and robustness of its smart contracts. However, there is an inherent risk that these contracts may contain errors or vulnerabilities that could lead to unintended consequences, including potential exploitation by malicious actors.

To address this risk, a comprehensive strategy that includes multiple audits by reputable third-party security firms has been implemented. The smart contract codes are rigorously evaluated for weaknesses to ensure compliance with best security practices. Additionally, ongoing audits and updates are conducted in response to any significant changes in the underlying blockchain technology. This proactive approach bolsters the security framework of CDCSOL and safeguards user assets.

5.3 Blockchain risk

The functionality of the CDCSOL protocol is also reliant on the stability and performance of its underlying blockchain network. Any disruptions such as network congestion, downtime, or technical failures, could impede users' access to their CDCSOL tokens or the underlying staked SOL. These issues can arise from various factors, such as network upgrades, governance decisions, or unexpected technical challenges.

To mitigate these risks, a dedicated development team actively monitors the performance of the relevant blockchains and maintains close communication with each foundation. Contingency plans are in place to address potential disruptions swiftly. This includes collaborating with validators and network stakeholders to ensure that any issues are resolved quickly, minimising the impact on our users and maintaining the integrity of the CDCSOL protocol.

5.4 Custodial risk

An error or security failure may result in a loss of data or access to stored digital assets, and this risk is mitigated by engaging the services of industry-grade digital asset custodians.

CDCSOL and SOL tokens will be held in custodial cryptographic wallets that are safeguarded using Multi-Party Computation (MPC) to ensure no private keys exist in their full form at any time. The keys will also be secured with Confidential Computing, specifically through multiple Trusted Execution Environments (TEE), a hardware-enforced security boundary that prevents keys or secrets stored within the host machine from being extracted by the administrator or malicious actors who have gained control over the host machine.

Our digital asset custodian technology is also certified **SOC 2 Type II**-compliant and has achieved **ISO 27001** (Information Security Management System), **ISO 27701** (Privacy Information Management System), **ISO 22301** (Business Continuity Management), **ISO 27017** (Security in the Cloud), and **ISO 27018** (Privacy in the Cloud) certification. Additionally, our custodian has also achieved the **Adaptive (Tier 4)** maturity level (as defined by the National Institute of Standards and Technology (NIST) Cybersecurity Framework developed by the US Department of Commerce).

5.5 CDCSOL market risk

As mentioned in Section 4, the market price for CDCSOL can fluctuate independently of the underlying asset it represents. The CDCSOL protocol will not actively influence any convergence in value between the issued CDCSOL tokens and the underlying SOL.

The protocol is designed to ensure that CDCSOL can always be redeemed for staked SOL on Crypto.com, and redemption will take place at a protocol-specified conversion rate that is independent of market prices.

5.6 Legal and regulatory risk

The legal and regulatory treatment of cryptographic tokens and digital assets may vary according to jurisdiction. Different regions may categorise cryptographic tokens and digital assets as currency, commodity, virtual currency, virtual commodity, other property, or an instrument. Some jurisdictions may also restrict or ban cryptographic token-related activities.

Any cryptographic token or digital asset may also decrease in or lose all of its value because of legal or regulatory changes.

CDCSOL and SOL staking are not available in all jurisdictions. It is your responsibility to ensure you are eligible to participate in SOL staking, liquid staking and/or engage with SOL and CDCSOL. Crypto.com may not offer or support SOL staking or CDCSOL in your jurisdiction.

6. The CDC Advantage

CDCSOL provides instant, secure, and efficient access to one of the best staking services in the industry. Crypto.com's SOL staking service is powered by best-in-class enterprise-grade validators, managed by an experienced team of cross-functional experts, and integrated with the wide range of exciting products that we offer at Crypto.com.

6.1 Best-in-class validators

All of our staking service providers are subject to extreme scrutiny to ensure they meet our performance and security standards. To date, all our Solana staking providers have achieved at least 99% effective uptime and offer service-level guarantees.

Prior to onboarding, all providers also undergo a rigorous audit of compliance and security policies, certifications, smart contracts (if any), and disaster recovery plans. We have potential to offer increased staking rewards to users as a result of MEV rewards due to better performance and higher uptime, which are distributed on a per-epoch basis to delegators and validators.

6.2 Cross-functional expertise

CDCSOL and the underlying staking services are maintained by a sophisticated team of protocol experts, technologists, and cybersecurity experts, ensuring we are able to respond rapidly to protocol updates and continuously deliver reliable performance.

6.3 Integrated Crypto.com experience

CDCSOL is one component of the overall Crypto.com experience. We are committed to improving the utility of CDCSOL in the Crypto.com ecosystem and the broader DeFi ecosystem. Examples of such utility may include:

- Acceptance of CDCSOL as collateral on DeFi protocols
- DeFi pools for CDCSOL/SOL and other pairs
- Tradeability of CDCSOL

7. Disclaimers

7.1 Laws and regulations

Crypto.com intends to operate in full compliance with applicable laws and regulations, endeavouring to obtain the necessary licences and approvals (if any) to provide staking services and CDCSOL functionality in your jurisdiction. It is not possible to guarantee, and no person makes any representations, warranties, or assurances, that any such licences or approvals will be obtained within a particular time frame, or at all. Moreover, laws and

regulations evolve over time. Crypto.com makes no guarantees, representations, or warranties that it will be able to obtain any necessary licences or approvals that may be implemented in the future. Accordingly, Crypto.com may restructure to alter the activities described in this white paper. In addition, such services may be unavailable in certain jurisdictions, or may not be available at all.

7.2 No financial or investment advice

This whitepaper does not constitute investment advice, financial advice, trading advice, or recommendation by Crypto.com, its affiliates, or its respective officers, directors, managers, employees, agents, advisors, or consultants, on the merits of purchasing, selling, redeeming, holding, or using any cryptographic token, nor should it be relied upon in connection with any other contract or purchasing decision.

7.3 Not a sale of security

This whitepaper does not constitute a prospectus or financial service document, nor is it an offer to sell, or solicitation of an offer, to buy any security, investment products, regulated products, or financial instruments in any jurisdiction.

7.4 No representations or warranties

No representations or warranties have been made to the recipient of this whitepaper, or its advisers, to the accuracy, quality, suitability, or completeness of the information, statements, opinions, or matters (express or implied) arising out of, contained in, or derived from this whitepaper, or any omission from this document, or of any other written or oral information, or opinions provided now or in the future to any interested party and their advisers. No representation or warranty is given to the achievement or reasonableness of any plans, future projections, or prospects, including the function or development of the CDCSOL protocol or any applications thereof, or services provided by third parties whom we do not control. Nothing in this document is, or should be relied upon, as a promise or representation of the future. To the fullest extent possible, all liability for any loss or damage of whatsoever kind (whether foreseeable or not, and whether or not Crypto.com has been advised of the possibility of such loss or damage) which may arise from any person acting on any information and opinions contained in this whitepaper, or any information made available in connection with any further enquiries, notwithstanding any negligence, default or lack of care, is disclaimed.

7.5 Translations

This whitepaper and its related materials are issued in English. Any translation is for reference purposes only, and is not certified by any person. No assurance can be made regarding the accuracy and completeness of any translations. If there is any inconsistency between a translation and the English version of this whitepaper, the English version shall prevail.

7.6 Graphics, illustrations, and examples

All graphics, illustrations, and examples in this whitepaper are for illustrative purposes only. In particular, graphics, illustrations, and examples with price references do not translate into actual pricing information.

7.7 Risk statements

Cryptographic tokens and custody of cryptographic tokens may be subject to expropriation and/or theft; hackers, malicious groups, or organisations which may attempt to interfere with the CDCSOL protocol and the dapps or networks that it operates within. Examples of interference include malware attacks, denial of service attacks, consensus-based attacks, Sybil attacks, phishing, hacking, social engineering, forks, misinformation campaigns, smurfing, and spoofing which may result in the loss of ability to access or control your cryptographic tokens. In such an event, there may be no remedy, and holders of cryptographic tokens are not guaranteed any remedy, refund, or compensation.

The regulatory status of cryptographic tokens and digital assets currently varies among jurisdictions and is subject to significant uncertainty. It is possible that in the future, certain laws, regulations, policies, or rules relating to cryptographic tokens, digital assets, blockchain technology, or blockchain applications may be implemented which may directly or indirectly affect or restrict cryptographic token holders' right to acquire, own, hold, sell, convert, trade, or use cryptographic tokens.

The value of cryptographic tokens and digital assets may fluctuate significantly over a short period of time. The price volatility may result in significant losses, including the total loss of investment.

The uncertainty in tax legislation relating to cryptographic tokens and digital assets may expose holders to tax consequences associated with the use or trading of cryptographic tokens.

Digital assets, and its related products and services, carry significant risks. Potential purchasers should take all of the above into account and assess the nature of, and their own appetite for, relevant risks independently and consult their advisers before making any decisions.

7.8 Professional advice

You should consult a lawyer, accountant, tax professional and/or any other professional advisors as necessary, before determining whether to purchase, sell, or otherwise use CDCSOL, or embed CDCSOL functionality within your applications.

7.9 Caution Regarding Forward-Looking Statements

This whitepaper contains certain forward-looking statements regarding our business operations based on the belief of Crypto.com, as well as certain assumptions made by, and information available to, Crypto.com. We do not purport to make any statement regarding the conduct or operations of any third parties whose actions (including commercial activity) may affect the CDCSOL protocol or any of the blockchain networks it operates within. Forward-looking statements, by their nature, are subject to significant risks and uncertainties, involve estimates and assumptions, and other factors beyond our control and prediction. These factors could cause actual results or outcomes that differ materially from those expressed in the forward-looking statements. Any forward-looking statement reflects the conditions of its date of issuance. We assume no obligation to update any statements to reflect subsequent events or circumstances after the date of the original statement to reflect the occurrence of unanticipated events.