TATA CONSULTANCY SERVICES

Building on Belief

Whitepaper

Crypto Custody: The Next Frontier of Transformation for Custodians

Abstract

Cryptocurrencies such as Bitcoin are increasingly finding a place in institutional investment portfolios due to their potential for high returns, despite the high risk. The future will see a rising demand for including this emerging asset class in both retail and institutional wealth management portfolios. Institutional investors are looking to their banks for safe custody and management of this asset class, underscoring the need for a robust, secure, technology-driven crypto custody solution.

This paper highlights the need for custodian banks to explore an approach that ensures safe custody of cryptocurrency-based assets while allowing their efficient and secure management. It further details the key application architecture components that contribute to the development of a robust and secure crypto custody solution.

Growing Demand for Safer Crypto Investments

The market capitalization of cryptocurrencies has been increasing since the invention of Bitcoin and other similar currencies. Despite the high volatility of cryptocurrency-based assets (crypto assets), there is a growing appetite among institutional investors for this asset class. However, the regulatory uncertainty around cryptocurrencies is influencing the level of acceptance of these assets in different geographies. In North America, for instance, large financial services players are offering products in the cryptocurrency segments. These include platforms for Bitcoin futures to be settled in Bitcoins and the establishment of Bitcoin funds, among other popular crypto asset initiatives.

As with other financial asset classes, there is a strong need to ensure the safe custody of crypto assets. The owners (investors) of these crypto assets should ensure maximum security of private keys as these are the proof of ownership. Safekeeping of private keys is a major security concern for every owner as any security breach could result in a complete loss of assets. Typically, these investors use the wallet services of cryptocurrency exchanges to store their private keys. Cryptocurrency exchanges are mostly unregulated and are often technology startups with poor risk management practices. Such services put private keys at a high security risk.

Institutional investors are looking for safekeeping services for these private keys from traditional financial intermediaries rather than tech startups. Investors would find it convenient to have a single consolidated portfolio view of all of their financial assets in different classes. Further, they expect their portfolio to be up to date with price and analytics information. Such business drivers are forcing custodian banks to look at offering crypto custody services along with traditional custody services (safekeeping of the customer's physical and electronic assets) to create a complete portfolio of facilities for their institutional customers.

Crypto Custody Services: Opportunities for Custodian Banks

Custodians can offer a wide range of financial services for cryptocurrency-based assets (see Figure 1), in turn creating exponential value for customers. Financial institutions providing custody services for traditional financial assets are uniquely positioned to offer additional crypto asset-specific services, given their industry expertise and built-in systems. Introducing such services will help them gain a competitive edge over other non-custody service providers such as retail banks or technology services providers.

Figure 1: Potential Range of Crypto Custody Services

Crypto custody services include safekeeping, analytics, trading, pricing and valuation, and payments and settlements. A safekeeping service provides digital locking facilities for private keys of the investor's crypto assets. Crypto assets can be held in the custodian's name in public ledgers (blockchain), allowing the custodian to operate these assets with proper permissions from the investor. Custodians can also provide analytics services with insights on the demand and transaction volumes of crypto assets. Research teams can use these analytics for portfolio advisory. Real-time pricing information of crypto assets can be sourced by custodians to update the portfolio value in real time. Cryptocurrency trading service can be offered through internalizing or routing to selected crypto exchanges. Also, payments and settlement services can be provided to customers using cryptocurrency balances either on-chain or off-chain for transactions such as futures contract settlement.

Additional value-added services that can be offered include asset servicing and lending and collateral management. The underlying cryptocurrency forks (for instance, Bitcoin forked into Bitcoin cash) could alter the crypto asset balances and valuations. Consequently, custodians will have to enable the asset servicing function and ensure crypto assets reflect the correct balances in the ledgers. Based on customer demand, custodians can facilitate lending and borrowing of cryptocurrency assets through an omnibus account structure setup backed by appropriate risk management policies governing the lending and borrowing transactions. Cryptocurrency assets can also act as collateral, and custodians can provide collateral management services to customers pledging these assets.

Crypto Custody Services: A Vault of Solutions

Regulatory uncertainty and potential risks are compelling many financial institutions to set up independent ventures to handle crypto asset-related services. Custodian banks will need to embrace the requisite technologies and adopt a secure and scalable application architecture (see Figure 2) to offer crypto custody services.

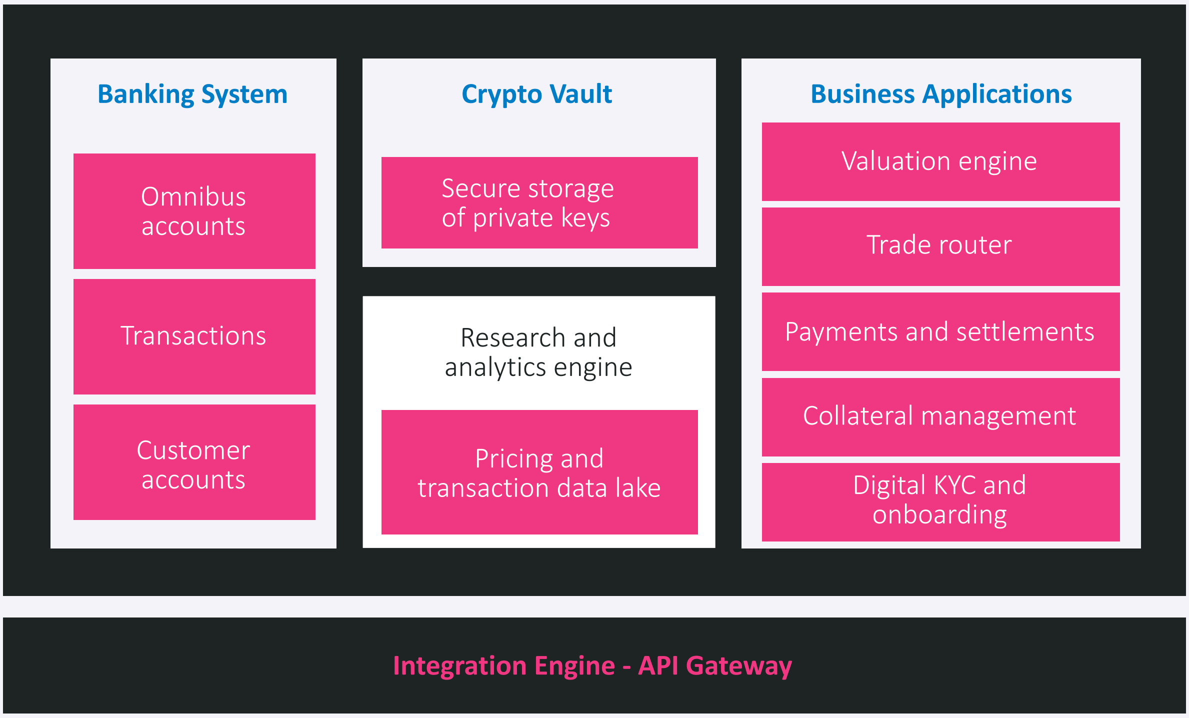

Figure 2: Crypto Custody Architecture – Application View

Investors, however, would be looking for a tamper-proof solution that offers easy access to their crypto assets through various channels and a consolidated view of their portfolio of investments through a single dashboard with near real-time asset valuations. Building a robust crypto custody services solution that alleviates the information security concerns of the investors will require traditional custodians to leverage digital technologies such as blockchain, cloud, and application programming interface (API) frameworks, and enhance systems and processes to make them resilient. To achieve this, banks will need to keep in mind the following four aspects:

Banking system: Custodian banks can, on behalf of their customers, hold cryptocurrency assets in public ledgers. The existing core banking system of custodian banks can also cater to crypto assets. However, these banks will need to have modernized core banking systems with secure integration capabilities to incorporate crypto wallet systems and public blockchains where the crypto assets will be transacted.

Crypto vault: The crypto vault is the system used for safekeeping the private keys of underlying crypto assets. Customers can also leverage the vault for authenticating cryptocurrency transactions before transferring them to public ledgers.

Research and analysis engine: A pricing and transaction data lake is required for analytics and research. The data lake will provide insights to customer research teams from the mined transaction data.

Business applications: Know your customer (KYC), customer onboarding, payments, trading, collateral and valuation engines are some critical business applications that enable an end-to-end crypto custody service. All these applications must be integrated with the banking and vault systems to enable crypto asset-related transactions and information flows. These applications will have to be enhanced to handle crypto asset based transactions.

Crypto Custody: What the Future Holds

Crypto assets have been around for more than a decade and have stood their ground despite regulatory ambiguity for most of their existence. With the increasing focus on regulation and rising interest from mainstream institutional investors, investments in cryptocurrencies are poised to become popular. The broad acceptance of these assets across institutional and retail investors can lead to crypto custody services gaining ground as a mandatory offering from banks, in their attempt to retain customers and increase share of wallet. However, as with mainstream assets, there are risks in ensuring regulatory parity for crypto assets. Risks of large-scale fraud or loss of private keys may also discredit crypto assets as a dependable alternative asset class. Custodian banks should be mindful of these challenges while offering crypto custody solutions. We believe that crypto custody represents an important and urgent business opportunity for banks. A deeper understanding of the technologies required to offer scalable crypto custody services, the underlying security concerns, and organization-specific aspects, is crucial to offering crypto custody services. Confident action is the key and banks must take the necessary steps to remain ahead of the pack.

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