

MULTICOIN CAPITAL

THORChain (RUNE) Analysis



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Executive Summary

Multicoin Capital has accumulated a large position in [RUNE](#), the native token of [THORChain](#), a decentralized cross-chain automated market maker (AMM). RUNE represents one of our largest public positions.

We believe that THORChain—which provides a trust-minimized way to trade *spot* tokens (not just derivatives) across blockchains—is a foundational piece of crypto trading infrastructure that will play an increasingly critical role within the crypto ecosystem as it continues to grow bigger and become more diverse.

There is a tremendous opportunity to build products that enable trust-minimized, cross-chain trading. In a world where many chains and tokens exist, traders naturally want to be able to trade assets across chains in a trust-minimized way.

The first of such cross-chain trading examples was the [Tier Nolan atomic swap](#). Since then, others such as [Simple Payment Verification](#), [Relays](#), and Merged Consensus have emerged. However, despite their best intentions, none of them ever successfully gained traction for an abundance of reasons (e.g., too slow, [free option problem](#), too expensive, etc).

In the years since the first cross-chain swap products launched a few years ago, the crypto ecosystem has become more heterogeneous: 80% of the top 25 tokens by market cap on [CoinGecko](#) are Layer 1 tokens of their blockchains. The diversity of chains creates the need for a trust-minimized, decentralized way to trade spot tokens across chains.

As new smart contract platforms like Solana, Polkadot, Near, and Avalanche mature, the number of chains is growing. As these ecosystems mature, the overall technical composition of crypto will become more heterogeneous rather than homogeneous.

Most investors have exposure to the blockchains they think will win; however, few actually have exposure to the growing heterogeneity of the overall ecosystem. This is a major opportunity, and we believe THORChain's RUNE token is the best way to invest in this thesis.

An Overview of THORChain

[THORChain](#) is a decentralized cross-chain automated market maker (AMM) exchange that allows users to trade spot tokens across blockchains. It enables traders to swap tokens across various Layer 1 blockchains without taking on counterparty or custody risk (for example, a trader could swap spot ETH for spot DOT without ever using a centralized exchange).

We [wrote](#) about the problems centralized exchanges create three years ago:



1. **Counterparty risk:** Users must send their cryptoassets to the exchange. Upon receipt, the exchange will credit the user's account on its own internal ledger. Centralized exchanges maintain private, internal books. Some of the most egregious players have been found to have been running with [fractional reserves](#) and subsequently gone [bankrupt](#). Others are suspected of market manipulation and [front-running](#) their customers.
2. **Speed:** To minimize counterparty risk, users must withdraw their cryptoassets when they finish trading. This is a cumbersome and slow process. This process can be particularly painful if the user faces withdrawal limits imposed by the exchange.
3. **Regulatory risk:** Centralized exchanges are subject to local regulations even if they serve a global user base. Local governments can force exchanges to delist assets. For example, recently Coinbase, Kraken, and Gemini delisted XRP. Regulators may also shut down exchanges and seize assets (this is a particularly big [problem](#) in South Korea).
4. **Theft risk:** Exchanges are the largest holders of crypto around the world, and as such they are prime targets for hackers.
5. **Cost:** Trading fees in crypto are an order of magnitude higher than those of traditional public equity markets. For example, Coinbase Pro (one of the largest exchanges by volume) charges 0.50% on each trade for both market makers and takers on their entry level tier.

Almost all of the discourse around decentralized exchanges (DEX) refers to intra-chain trading on exchanges like Uniswap, Sushiswap, Curve, and Serum. THORChain is novel because it supports native tokens across many chains, and is uniquely positioned to deliver on the original promise of decentralized exchange between any asset.

A powerful byproduct of THORChain is that protocol teams can build on any THORChain-integrated blockchain and easily kickstart liquidity from other crypto ecosystems. For example, one of the primary reasons teams choose to build on Ethereum today is that they can launch a token on SushiSwap or Uniswap with immediate liquidity. Now, if a protocol team determines that Polkadot or Solana is better suited for their specific needs (e.g. high throughput and low latency), they can launch on those blockchains. Using THORChain, the new protocol can tap into the liquidity of the Ethereum ecosystem. This is not yet fully appreciated by the market. THORChain levels the playing field across smart contract platforms.

The Opportunity

Trading is one of the primary use cases for crypto. However, trading across chains requires users to trust centralized exchanges and use two wallets (e.g. [MetaMask](#) for Ethereum and [SolFlare](#) for Solana). This process is clunky. Swapping PERP tokens on Ethereum for SRM tokens on Solana is a UX nightmare.

One solution to this problem is to trade synthetically. We recently [published](#) an overview of all the



major financial constructions that are being used to trade synthetic assets. However, synthetic trading cannot displace spot trading for a number of use cases.

Why does spot trading matter? Because unlike stocks and bonds, many cryptocurrencies are actually useful and have native utility value. Oftentimes, users of Layer 1 networks need to use the tokens themselves to accomplish some explicit objective. A few examples:

1. Synthetic XMR on Ethereum isn't privacy preserving.
2. Synthetic Helium Network Tokens (HNT) can't be used to pay for wireless data transfers.
3. Synthetic Arweave (AR) can't buy storage on the Arweave network.
4. Synthetic Siacoin (SC) or Filecoin (FIL) cannot be used to pay for data storage.
5. WBTC doesn't offer the same censorship resistance properties as native BTC.

Access to spot assets is becoming increasingly important as new, more useful Layer 1 networks launch. Tokens today have far more embedded utility beyond pure speculation.

Trading on centralized exchanges presents a significant amount of risk. THORChain provides an elegant alternative: non-custodial, permissionless, decentralized exchange across blockchains. For users who want to preserve privacy and/or maintain custody of their assets at all times, THORChain can obsolete one of the most important functions of centralized exchanges (CEXs).

THORChain Network Overview

THORChain enables cross-chain swaps via a network of nodes and liquidity providers (LPs). The protocol's native token, RUNE, serves three critical roles: 1) it secures the network, 2) it acts as the common quote currency for each trade in the system to maximize liquidity of all assets in the exchange, and 3) it collects fees.

THORChain's nodes connect to various chains through [one-way state pegs](#) by creating addresses across these chains, which are controlled by the THORChain nodes. THORChain nodes use advanced [multi-party computation](#) (MPC) technologies such as [distributed key generation](#) (DKG) and [Threshold Signature Schemes](#) (TSS) to ensure that no single THORChain node has control over the users' assets.

Let's consider a simple example. THORChain nodes run a DKG to produce a private/public key pair, where the private key is virtual and cannot be recovered without 67% of the nodes colluding (the standard BFT-network security threshold). Users can send BTC to that address to send BTC into the THORChain network, which also hosts the exchange. The funds are secured by the market cap and liquidity of RUNE and the multiparty computation system. When users request a withdrawal of BTC from THORChain, THORChain nodes run a multi-party computation to sign a message, which releases the funds back to the user. While BTC is custodied by the THORChain nodes, users can trade BTC for any other asset supported by THORChain by trading BTC-RUNE and then RUNE-[other asset]. These trades are executed on THORChain's decentralized exchange and are completely permissionless and



ensorship resistant. Traders can interact with the network using simple on-chain transactions or via any web, mobile or desktop interface.

CONTINUOUS LIQUIDITY POOLS

With the advent of automated market makers (AMMs) like Uniswap, many teams have been experimenting with new ideas to improve the maker and taker experience. THORChain invented a new system called Continuous Liquidity Pools (CLPs) that represent one of the most meaningful improvements to AMMs since the launch of Uniswap. CLPs are structurally similar to Uniswap's and Balancer's AMMs, but with one critical difference: transaction fees are a function of trade slippage as opposed to a fixed percentage (e.g. 30 basis points on Uniswap).

One of the common criticisms of AMMs is that they allow arbitrageurs to take advantage of the AMM's LPs. For example, if the price of ETH moves from 0.03 BTC to 0.04 BTC on all the major exchanges due to some news, Uniswap will still offer ETH for sale at 0.03 BTC until arbitrageurs push the price up to 0.04 BTC. If the price of ETH never returns back to 0.03 BTC, the LPs in that Uniswap pool underperform buy-and-hold strategies—this is commonly referred to as Impermanent Loss (IL), even though a more accurate name is unrealized loss.

THORChain's CLP design mitigates this problem. If an arbitrageur pushes ETH-BTC from .03 to .04 in a single transaction, they would have to pay higher transaction fees, which would benefit the LPs and reduce or even eliminate IL. The more slippage a trade causes, the more fees traders pay to LPs who made that trade possible.

Knowing this, it's possible that arbitrageurs might just break their trades into tiny pieces to avoid the higher fees imposed by the CLP. THORChain solves this problem by prioritizing the trades that are paying the highest fees. This is actually enforced in the consensus protocol itself (unlike in Ethereum where mining pool operators control the order of transactions in a block). Arbitrageurs must weigh the risks of not getting their transactions included at all against paying higher slippage fees. Because this mechanism is enforced in consensus itself, it guarantees that THORChain LPs will not get run over when markets are extremely volatile. This reduces downside risk for LPs, and enables them to offer tighter spreads for organic takers.

[Gauntlet](#), a well known quantitative research firm in crypto, [simulated](#) the returns of LPs in Uniswap and THORChain, and verified that THORChain LPs have the potential to earn higher returns.

LPs must deposit RUNE to every pool in the network, and each trade is executed against RUNE. For example, if a user swaps ETH for DOT, THORChain will sell ETH/RUNE and then buy DOT/RUNE. This concentrates global liquidity rather than fragmenting liquidity across low-volume pairs like DOT/ETH.

Nodes must bond a minimum amount of RUNE for the right to validate on the network and earn fees. After certain intervals, nodes cycle between 'active' and 'standby' status to ensure operations are as

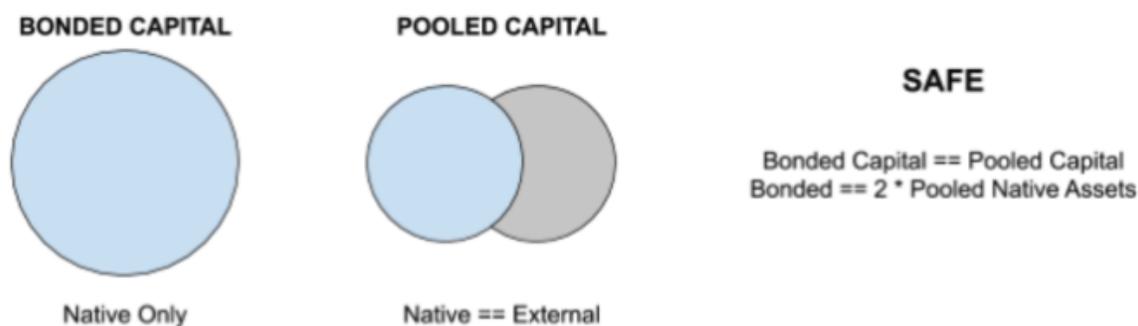


decentralized as possible. The inner workings of the network are abstracted away from node operators, and costs are minimal when deploying upgrades or modifications to the network.

Note that all system rewards (trade fees, transaction fees, block rewards) are shared between node operators and LPs. The split of rewards between node operators and LPs is governed by the Incentive Pendulum, which is explained in more detail in the next section.

RUNE TOKEN ECONOMICS

RUNE is the native token of the THORChain network. The network remains secure based on the relative balance of RUNE to other assets in the system. For every \$1 of a native asset in the network, LPs must pool an equivalent \$1 of RUNE to the corresponding CLP, and nodes in the network must bond \$2 of RUNE to secure consensus. This incentivizes node operators to operate the network honestly, as the amount of their bond that can be slashed is always greater than the value of assets in the liquidity pool; censorship or theft is strictly unprofitable. The amount of RUNE in the network therefore aims to be balanced 67%-33% between nodes and LPs. The network is designed to incentivize a balance of \$3 of RUNE for every \$1 of other assets in the network.



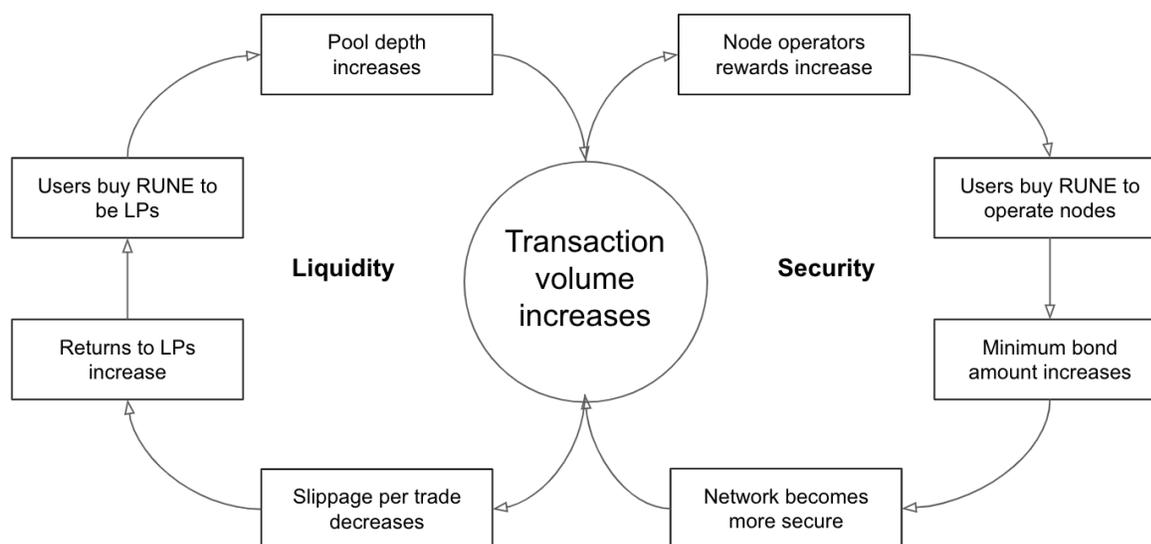
When the system is out of balance, the network shifts block rewards and network fees in order to incentivize the node operators and LPs to restore the balance—this mechanism is referred to as the [“Incentive Pendulum.”](#)

For example, if more than 67% of the RUNE in the system is bonded to node operators, the protocol will divert more rewards to LPs. If more than 33% of the RUNE in the system is in liquidity pools, the protocol will divert more rewards to node operators.

The top 5 Ethereum-only DEXs by market share have on average collectively [traded](#) \$2 billion a day over the last 30 days (compared with \$4 billion on Coinbase) and these DEXs trade exclusively ERC-20 assets. As THORChain adds support for all the major chains over the coming months, THORChain could overtake many centralized exchanges as the venue for best execution.



As more trades route through THORChain, RUNE becomes more valuable. RUNE holders can participate in the revenues of the system by bonding their RUNE or becoming LPs. This directly links the value of RUNE to the trading volume and liquidity of the THORChain decentralized exchange.



History

Many people don't know that the origins of THORChain pre-date many of the popular decentralized exchanges today. THORChain was born at a Binance-sponsored hackathon in 2018. The pseudonymous team, working on a decentralized exchange, continued with the project after the hackathon and continued to iterate for several months; however, they were unable to finish the project due to a lack of infrastructure and developer tooling at the time.

In 2019, the project picked up momentum again with the release of the GG18 Threshold Signature Scheme (TSS), which enabled the trustless cross-chain bridging mechanisms that underpin THORChain today. KZen's (from the makers of ZenGo) implementation of TSS provided an efficient method for distributing signing rights across multiple parties, which ultimately enabled THORChain's one-way state pegs. The advancements in TSS also coincided with meaningful improvements to Tendermint Core and the Cosmos SDK. These developments enabled THORChain to build the core protocol.

As initial concepts of the bonded/pooled liquidity-based security model of the system came together, the team built a proof of concept under the moniker 'Instaswap' at the Cosmos Hackathon in Berlin in June 2019. Soon after, the first public implementation of the product was launched under the name BEPSwap, a DEX on Binance Chain for swapping Binance Chain assets. In July 2019, the



team adopted the name THORChain, and raised \$1.5 million in an Initial DEX Offering (IDO) for RUNE on Binance Chain.

Since then, THORChain has prioritized radical transparency around development and treasury operations. The team has adopted the ethos of building in public; they [share](#) progress and priorities updates each week, and incorporate valuable contributions in mechanism design and architecture from the community. This approach has led to the development of a rich ecosystem around the core protocol with community members building explorers, frontends, wallets, and liquidity dashboards with THORChain's developer SDKs.

The core team is 8 developers. The treasury is currently worth \$25 million, which provides ample runway. Details about protocol reserves and planned community grants can be found [here](#).

In August 2020, THORChain launched its first proof-of-concept network, Chaosnet, with 14 node operators. BEPSwap, the client that runs Chaosnet is currently 74 nodes. It is dedicated to performing swaps among Binance Chain assets, and processes around \$30 million of daily trading volume with around \$70 million of value pooled in liquidity pools. In January 2020, the THORChain team released a Binance Chain-Ethereum bridge and partnered with SushiSwap to establish liquidity for an ERC-20 RUNE on Ethereum. There is currently \$26 million worth of liquidity across RUNE pairs such as ETH, ALPHA, USDT, PERP, and AAVE on SushiSwap.

All of this work culminates with a major network event that is coming soon: the multichain launch. The launch will expand support for BTC, ETH, LTC, BNB, and BCH. Once live, traders will be able to trade ETH and BNB, or any ERC-20 or Binance Chain asset, into BTC, LTC, or BCH and vice versa (assuming sufficient liquidity is added to the network) without sacrificing custody of their funds.

THORCHAIN COMMUNITY

The THORChain community understands the power of memes in helping a community develop a shared identity. The first time we heard the name THORChain we thought it was silly, but overtime the team has demonstrated that this was a deliberate and thoughtful decision. Due to the association with Norse mythology, there is a rich cast of characters and meme content open for anyone to use. Having easily relatable memes can help spread awareness of a project.

Since launching, THORChain has attracted a large community of third-party teams building products to help push the ecosystem forward. Some examples include:

1. [THORChain Explorer](#) by Pusher Labs—THORChain.net is a block explorer for the THORChain project. The explorer provides a well-documented API, a summary of network stats, and transaction histories.
2. [XDEFI](#)—a MetaMask-like browser wallet that will support chains connected to THORChain.



3. [BEPsSwap Simulator](#)—A simple tool to assist with calculating pool prices on THORChain.
4. [THORChain Help](#)—One of the biggest challenges the THORChain team has faced is explaining the product to non-technical users in an easily digestible way. Luckily, a third-party team built a simple [THORChain explainer](#) that describes the system for non-technical users.
5. [MIDGARD API](#)—a public API to query THORChain, on which community-built dashboards, such as [THORChain.net](#) (network activity monitoring) and [Runestake.info](#) (LP returns tracking), are built.
6. [XChainJs](#)—a set of JS libraries for building on top of THORChain.

The THORChain community is one of its greatest assets today. The THORChain team has done a great job of cultivating the culture. They collectively embody the ethos of a decentralized network. They also have an actively updated “planned obsolescence” date, which signifies the point when the core developers will transfer ownership of the code base to the community to maintain. This is currently set for July 2022.

Competitive Analysis

[ChainFlip](#) is building a similar AMM-based, cross-chain swap product over a custom state machine reaching consensus using TSS. The project was announced in July 2020, and the team is currently working on a proof-of-concept.

The key difference in ChainFlip’s implementation of non-custodial cross-chain swaps is the variant of threshold signatures used, EdDSA (versus THORChain’s ECDSA), which incorporates chain-specific logic in the state machine. THORChain is agnostic to UTXO/account models, whereas ChainFlip needs to know the nuances of each chain. As a result, adding support for new chains is substantially more difficult and time consuming. The tradeoff is faster key generation and signing by posting transactions to permissioned APIs called “quoters,” which implies fewer sub-vaults across the system, but a significantly wider attack surface.

The ChainFlip team has previously worked on infrastructure for Monero and launched LOKI, a privacy coin with a low-latency, anonymous networking layer.

[Polkadot](#) and [Cosmos](#), if they fulfill the visions outlined in their respective whitepapers, will be great at connecting various blockchains. However, they are primarily designed to connect Substrate (Polkadot) and Cosmos SDK-based blockchains. For example, Polkaswap cannot process spot native ETH/BTC swaps.

[Ren](#) is another orthogonal competitor. RenVM is focused on pegged-asset transfer, and plans to move through several phases of progressive decentralization. The current implementation of RenVM (phase sub-zero) is largely centralized, with core developers maintaining control of all functional



nodes while community nodes simply operate the p2p networking layer. In future iterations, community nodes will run consensus, and likely add support for large cap assets. Ren has substantial developer resources and institutional support but is targeting a different market: wrapped tokens, not spot trading. Wrapped tokens carry a major risk; that is, they could de-peg because it is fundamentally less safe than holding spot BTC.

[KEEP](#)'s tBTC is perhaps the most decentralized implementation of wrapped/pegged BTC. Currently there are more than 1,800 tBTC on Ethereum across more than 1,000 addresses. tBTC's system bears some resemblance to THORChain in that the system uses ECDSA threshold signatures for multi-party computation, but there are key differences in implementations of the bonding model, signer selection, and deposit verification.

Similar to Ren, Keep is going after the market for pegged assets, and not spot trading. Multicoin Capital is invested in Keep, and we are excited about their product offerings (notably tBTC).

Upcoming Catalysts

The THORChain team recently [released](#) the multi-chain testnet, featuring native BTC to ETH, LTC, BCH, and BNB asset swaps. And the core team is actively working to add support for Dogecoin, Monero, Zcash, Polkadot, Haven Monero, and several other chains alongside their mainnet launch, which will be released over the next few months.

In the long term, the team is looking to make improvements to the capital efficiency of the network by offering the ability to trade with leverage. Some examples include:

1. **Increased capital efficiency**—Pool lending using liquidity shares as collateral, with interest payments collected by the pools associated with the debt assets
2. **Synthetic assets**—THORChain synths are unique in that they're backed using liquidity shares, and represent 50% of the spot asset and 50% RUNE. They are IBC-compatible and thus can be sent anywhere in the Cosmos ecosystem.
3. **Composite assets**—Composite assets such as THOR.USD or THOR.ALT are LP share tokens of multi-asset synth pools that generate fees from trading activity.

Conclusion

The THORChain team has been executing relentlessly on their roadmap. They are among the most transparent teams in the space. They provide [granular updates](#) on development progress, treasury/operational reserve management, and long-term strategy on a regular cadence. They are best in class at communications, which has helped build and engage a strong community.



THORChain's team is committed to building out their core infrastructure in an open, accessible manner to ensure that THORChain decentralizes to community control. The treasury currently allocates \$200k per month in grants from community development to third-party developers.

THORChain represents the future of trust-minimized, cross-chain trading. The THORChain team has been building breakthrough technology and cultivating an amazing community that addresses a huge market.

We couldn't be more excited to invest in and support the THORChain team, and believe that trustless and permissionless exchanges across various blockchains will dominate spot crypto-crypto trading.