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<https://www.btcc.com/en-US/academy/crypto-basics/what-is-bitcoin-lightning-network-and-how-it-works>

### What Is Bitcoin Lightning Network And How It Works

**Developers Thaddeus Dryja and Joseph Poon proposed a protocol called the Lightning Network in 2016 that would achieve faster and cheaper transactions without changing the block size.**

The scalability problem of [Bitcoin](#) means that smaller transactions can congest the blockchain. The Lightning Network was created to address this issue.

Since each block on Bitcoin's [blockchain](#) takes an average of 10 minutes to process, only a small number of transactions can go through at a time. In 2016, developers Thaddeus Dryja and Joseph Poon proposed an idea that could enable [fast and cheap transactions](#) on the network without having to change the block size. They called it, the "Lightning Network."

The Lightning Network creates a second layer on top of the bitcoin blockchain that uses user-generated, micropayment channels to conduct transactions more efficiently.

These transactions are much faster than regular bitcoin transactions because they don't need to be broadcast to the entire network. And because there are no miners that need incentivizing, transaction fees are low or even non-existent.

### How does the lightning network in bitcoin work?

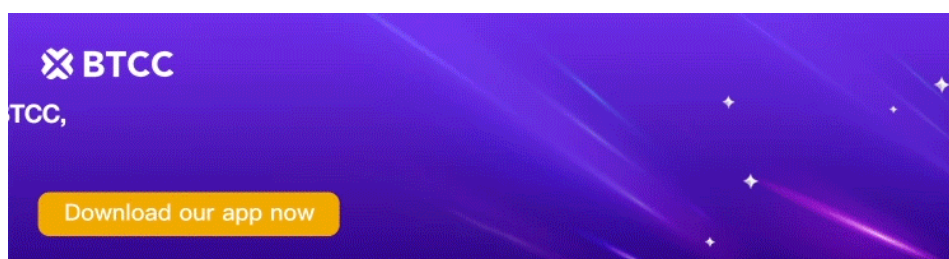
Think of Bitcoin's main blockchain as a highway, and the Lightning Network as a series of side streets that reduce the highway's congestion from smaller transactions.

First, two parties who wish to transact with each other set up a multi-signature wallet (which requires more than one signature to enact a transaction). The [wallet](#) holds some amount of bitcoin. The wallet address is then saved to the Bitcoin blockchain, setting up the bidirectional payment channel.

The two parties can now conduct an unlimited number of transactions without ever touching the information stored on the blockchain. With each transaction, both parties sign an updated balance sheet to reflect how much of the bitcoin is stored in the two wallets.

Once both parties finish transacting and close out the channel, the resulting balance is registered on the blockchain. In the event of a dispute, both parties can use the most recently signed balance sheet to recover their share of the funds.

It is not necessary to set up a direct channel to transact on the Lightning Network - you can send payments to someone via channels with people with whom you are connected. The network automatically finds the shortest route. The network's goal is to allow users to make smaller payments without transaction fees or delays.



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## Challenges ahead

The Lightning Network launched a beta version in 2018, but was far from fully operational. Since then, the number of nodes on the Lightning Network has doubled year over year, moving the project closer to achieving its goal of making bitcoin a viable currency for day-to-day transactions.

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The network went from 8,321 nodes in January 2021 to 19,374 in January 2022, a 132% increase. It should be noted that this includes only public nodes (nodes accessible to anyone). The number of total nodes is much higher if you were to include private connections (nodes accessible only to permissioned users).

Despite significant growth in recent years, the Lightning Network still faces challenges to overcome if it wants to solve bitcoin's scalability issues. The most demanding issue is security. Because nodes on the Lightning Network are required to always be online, they become more vulnerable to attacks. And while the network aims to reduce fees incurred from processing transactions on bitcoin's main network, it includes its own set of additional costs for opening and closing channels, along with routing fees. These are issues that will likely be solved with time, as its technology develops and becomes fully optimized.

Exchanges are also beginning to adopt the technology to optimize bitcoin withdrawals and deposits for their users. Kraken announced in 2020 that it would be adding support for the Lightning Network in 2021, but as of January 2022, it has not yet implemented it. U.K.'s CoinCorner, Vietnam's VBTC and San Francisco-based OKCoin have all added Network support. 2022 saw Block announce the integration of the Lightning Network into their popular Cash App, a move they first committed to in 2019. The adoption of the Lightning Network by prominent exchanges is good news for the future of the network, and while most agree that the Lightning Network will not be the solution to all of Bitcoin's future challenges, it will certainly play a role in the future of cryptocurrency.

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