The Lightning Network

What is it?

It has been called "the future of Bitcoin"[i] and it has made the list for the five top cryptocurrency trends for 2018.[ii]

The Lightning Network is actually an open source payment protocol that sits on top of blockchains (for example the Bitcoin network) to allow for anonymously routed payment channels, that have the capacity of millions of transactions per second.[iii] It is a decentralized network that uses the smart contract functionality in the blockchain to facilitate instant payments across a network of participants.[iv]

The original white paper has been written by Poon and Dryja (2016).[v]

The Lightning Network comes as an answer to the "Bitcoin Scalability Problem". If the Lightning Network works as intended, the Bitcoin can theoretically scale to infinity (Quittem, 2018b).

Background: The Bitcoin Scalability Problem

The Problem: The capacity of the Bitcoin network to process transactions (i.e. the amount of transactions that the Bitcoin network can process) is limited due to the size and frequency of blocks.

The possible solution to the "Bitcoin Scalability Problem" is highly debated – it is rather an "ideological battle", not just a technical debate[vi] - and there are two camps, as there are two scaling models[vii]:

1. The **Cash model** or "**on-chain scaling**" or "Bitcoin Unlimited" and
2. The **Core model** or "**off-chain scaling**"

The Ideological Debate

The Cash model (Bitcoin Unlimited) is about increasing the size of blocks – provided that the miners decide (vote) to do so. Transactions will stay on the blockchain and the miners would be in control of the transaction fees, their only reward and incentive for processing the transactions that will remain after the limit of 21 million 1Bitcoins is reached.

The Core model or "off-chain scaling" employs technologies such as Segregated Witness (SegWit), Sidechains, and the Lightning Network (LN). This solution keeps the cryptocurrency more **decentralized**, as it does not involve giving additional control to miners. Instead, some of the transactions may be conducted off-chain.

The debate could go on to address more technical concerns, but the main issue here is the ideological issue of decentralization.

Andreas Antonopoulos himself has a distinction to make (and much more to say) in his very interesting video "**Bitcoin Q&A: Misconceptions about Lightning Network**"[viii]

Antonopoulos' video is actually a critique of a popular video titled: "**How The Banks Bought Bitcoin | Lightning Network**"[ix], that you might want to watch before Antonopoulos' video.

You may want read more about the "big divide" in William-Grut and Price (2017) and in mooncryption (2018).

Also, please read articles i-iv to get an idea of:

- How can the Lighting Network Resolve the Bitcoin Scalability Problem? And
- How the Lighting Network Works
- Benefits and Applications (iii) [including Atomic Swaps.]

If you would like to go into more details, there is also the original White Paper (v).

And of course, there are more videos by Andreas Antonopoulos, including videos from the UNIC Digital Currency MOOC (see endnotes for references).[x], [xi]

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[i] Daniel Frumkin. 2017. How The Lightning Network Can Resolve Bitcoin's Scaling Issues. [ONLINE] Available at: https://www.investinblockchain.com/lightning-network-bitcoin-scaling/ . [Accessed 30 April 2018].

[ii] Brandon Quittem. 2018a. 5 Cryptocurrency Trends To Guide Your Investment Strategy In 2018. [ONLINE] Available at: https://www.investinblockchain.com/cryptocurrency-trends-2018/ . [Accessed 30 April 2018].

[iii] Brandon Quittem. 2018b. Will Lightning Network Make Privacy Coins And Pure Currency Coins Obsolete?. [ONLINE] Available at: https://www.investinblockchain.com/lightning-network-effect/ . [Accessed 30 April 2018].

[iv] Lightning Network. 2018. Lightning Network: Scalable, Instant Bitcoin/Blockchain Transactions. [ONLINE] Available at: https://lightning.network . [Accessed 30 April 2018].

[v] Poon, J. and Dryja, T., 2016. The bitcoin lightning network: Scalable off-chain instant payments. Available at: https://lightning.network/lightning-network-paper.pdf [Accessed 30 April 2018].

[vi] Oscar Williams-Grut and Rob Price. 2017. A Bitcoin civil war is threatening to tear the digital currency in 2 - Here's what you need to know. [ONLINE] Available at: http://www.businessinsider.com/bitcoins-hard-fork-bitcoin-unlimited-segregated-witness-explained-2017-3 . [Accessed 30 April 2018].

[vii] mooncryption. 2018. Hoping for a Lightning Strike — Bitcoin Scaling Debate Explained. [ONLINE] Available at: https://steemkr.com/bitcoin/@mooncryption/hoping-for-a-lightning-strike-bitcoin-scaling-debate-explained . [Accessed 30 April 2018].

[viii] Andreas Antonopoulos, 2018. "Bitcoin Q&A: Misconceptions about Lightning Network", [online video] available at: https://www.youtube.com/watch?v=c4TjfaLgzj4 . [Accessed 30 April 2018].

[ix] Decentralized Thought, 2017. "How The Banks Bought Bitcoin | Lightning Network", [online video] available at: https://www.youtube.com/watch?v=UYHFrf5ci_g . [Accessed 30 April 2018].

[x] Andreas Antonopoulos, 2018. "MOOC 9, 5th Live Session with Andreas Antonopoulos - Bitcoin in Practice Part 2" https://www.youtube.com/watch?v=vRoQjuKPBaE . [Accessed 30 April 2018].

[xi] Andreas Antonopoulos, 2018. "Bitcoin Q&A: Lightning's security model" https://www.youtube.com/watch?v=_GNsT_ufkec .[Accessed 30 April 2018].