# Dominik Schiener and Hans Moog discuss Shimmer, IOTA's upcoming incentivized test network

[Video link on YouTube]
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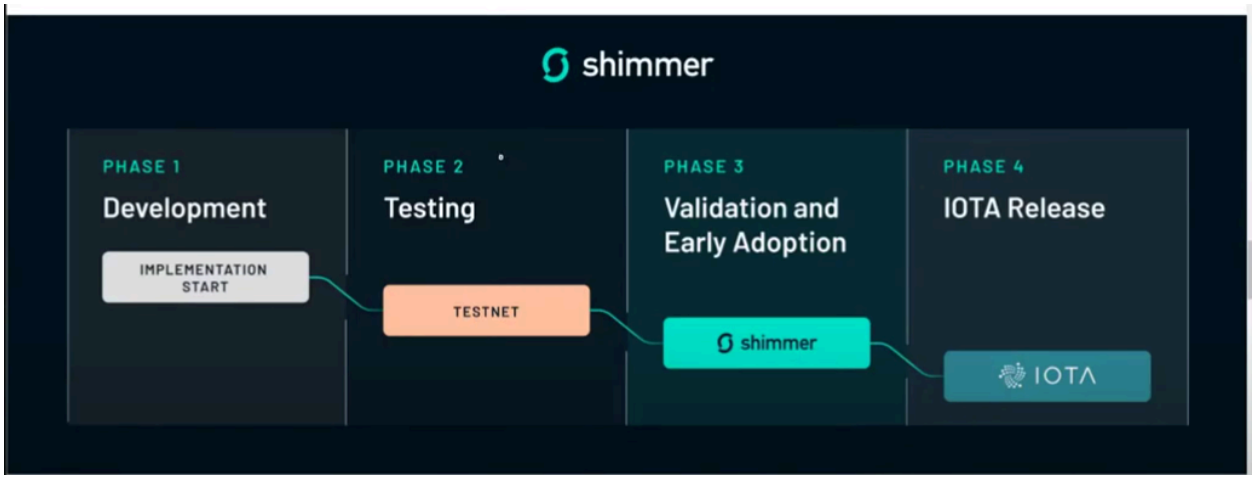
## Introduction

- Dom: We had an exciting week as we launched something we have worked on for over a year: Shimmer!
    - Today we will talk about the reasoning behind Shimmer (why do we want an incentivized staging network), the future of Shimmer, and how it fits into the entire ecosystem.
- Hans will join in a few minutes to give his insights into Shimmer & IOTA 2.0
- Shimmer Network: Zero Fees, Endless Possibilities. Shimmer is an incentivized staging network. We need to go through a series of stages and thorough testing and validation before upgrading the mainnet with new features. Before we just had phase 1 and phase 2 before releasing onto the mainnet:




    - Chrysalis introduced UTXO and some simple output types, but the point of Chrysalis was to bring more innovations onto the mainnet, such as staking, tokenization, and smart contracts so we have a programmable, multi-asset ledger (with any kind of token, NFTs, etc).
    - We have a series of upgrades coming up, such as tokenization and smart contracts (beta release already out on the test net). How to upgrade the IOTA mainnet with these exciting, crucial updates as safely as possible? That's where Shimmer comes in.
    - Shimmer will always be the first network to be upgraded. You can start building your applications on Shimmer, knowing the APIs and integrations will be the same on the mainnet later.

    - Shimmer provides opportunity for testing and attacking. It gives early access to innovations coming out on IOTA, and it battle-tests the upgrades.
    - Shimmer is an incentivized environment to build dApps, partnerships, etc. It provides validation, to reduce the number of bugs that might get carried onto the mainnet.
- We want to upgrade the IOTA mainnet with the new consensus, new architecture, but we want to be sure it is done safely. Shimmer provides an opportunity to test transition to coordicide.
- Our vision has always been for IOTA to be the best base layer, on which new layer 1 applications can be built on top. We want the trust anchor to always be secure, and always at the forefront of innovation. We want to accelerate the upgrade process.
- The focus is on utility and adoption, and making sure IOTA becomes a competitive player, able to leverage the zero-fee advantage.

## Hans enters the chat.

- How are you doing, Hans? Much better than last week-his cut is healing, his eye is not bloody. A bit of a fever from getting his vaccine, but he is doing well.
- Please give us a perspective with what has been going on with IOTA 2.0
    - We have been making updates to the consensus this past month to On-Tangle Voting (Multiverse consensus). It has been a lot of work updating the code.
    - It has been the result of 2 years of investigating this. It turns out to be much easier to code, with a very modular design where the actual consensus is just 170 lines of neatly-isolated code, so everything is very modular, very maintainable.
    - This is the first time we have the protocol function implemented since we had the idea 2 years ago.
    - There is a lot of code, and we anticipate there being a lot of bugs. We are working on a bug right now-the DevNet is not currently issuing any messages. We will release a new version tomorrow or the day after.
    - There is still a lot of work to do to optimize everything, clean up the code.
    - IOTA will have one of the fastest consensus mechanisms in the space, and we believe it is also optimal for messaging complexity, robustness, and security.
    - It is going to be very interesting to see this in the wild. For that I am glad to have the Shimmer network as a place where we can release things as fast as possible into the wild, without having to go through the really extended testing periods required for launching on the Mainnet.
- Dom: IOTA 2.0 was seen as an innovation testbed for us. With the first release of colored coins on the DevNet, and then Smart contracts. The position was that IOTA 2.0 DevNet was the place to release exciting concepts we felt would be really important for the future. It was a place to test things before going to the mainnet.
    - Hans: Levente has been the driving force behind the tokenization, and it has been amazing-I have not been able to keep up with the whole development process. There is so much happening in IOTA right now-DID, Smart Contracts,

etc. All separate teams doing great work-I look at what they have done and it is all very good. Dom pulled up the IOTA Tokenization Framework Specs paper, written by Levente Pap.
    - Dom: Shimmer is meant for us to accelerate the adoption of these innovations, and making sure they are safe. Output types can disrupt a network if there is a bug, for example.
- Dom: What really got us to this stage? We had different considerations, like bug bounty programs or capture the flag concepts--really complicated stuff. Ultimately Shimmer seemed the simplest approach we could take that would add value.
    - Hans: I totally agree. I see Shimmer as IOTA's crazy little cousin. Very similar to what Polkadot did with Kusama. They also introduced something nobody had done in the real world, and having the ability to just introduce new concepts and play around with them is really valuable.
    - There are things you can objectively measure in testing, but when it comes to other questions, like staking or incentives to run a node, it is beneficial in the bootstrapping phase to test different options in a real environment. Sometimes there are two options, and having a place where we can deploy both options is a great way to see which one does better. It lets us play with different economic models.
    - There are other innovative things we want to see on the protocol at some point, such as layer 1 smart contracts based on UTXOs. We have essentially created a generalized model for distributed computing.
        - Programming is essentially input, processing, output. The way we modeled the ledger state, we have inputs that can be referenced by transactions and produce outputs, which creates a generalized model for distributed computing. If we can do this in an optimal way, then this would be a pretty big thing. However, this is a bit hard to test on the mainnet because once you add these outputs you cannot really take them away. If someone were to write a level-1 smart contract, for example, and you find out it really slows down the network, once it is in place you cannot really remove it. Hence, Shimmer gives an opportunity to test ideas like that safely. It gives Shimmer a real value proposition as the first layer-1 feeless DLT that supports non-totally-ordered smart contracts.
        - We have so many things we want to try out that nobody has ever tried before. We have to try them out to see if they actually work.
    - Dom: We want to accelerate innovation. The main argument of IOTA is that a DAG is the most-efficient way to run a distributed ledger, and it allows us to do more innovative things, like confirming transactions in parallel and having smart contracts on top. The main argument has always been reaching mainstream adoption. Everything is still in the early stages and needs testing. The beauty that has come out of crypto, and DeFi in particular, is rapid evolution. If a protocol makes sense, they will survive. There is a constant, fierce battle of ideas in the market, and Shimmer allows us to rapidly innovate. It allows us to evolve not just in the application layer, but on layer 1. We are not just copying a blockchain or

adding proof of stake. . . it is an entirely new architecture which offers builders the opportunity to try out entirely new things.
    - Hans: I have been coding since I was 11 years old. I know a lot about problems related to scaling. Back in the day we had little computing power, so it was advantageous to write very efficient code. Other protocols are struggling because they cannot run smart contracts in parallel. It limits any EVM chain to something like 50-200 tps and doesn't allow them to run on multiple cores because you always need total order. If you want to overcome these limitations then you need a completely different technology. IOTA has the potential to solve these problems. Each output is an isolated state. Nodes can see different states. It is impossible in a blockchain, which is inherently a single thread of information.
    - IOTA solves so many problems in such a simple way--I think it is going to be really, really big. I don't think people really understand what we have built here. It will be exciting for the researchers to catch up and explore all the structures.
    - I have been in contact with researchers from other ecosystems, and everyone who has seen the solutions has been extremely excited. People discovered aspects of it of which I was completely unaware: they would say, "No way, you are solving THIS problem as well!" And I would say, "Oh yeah, you're right. I didn't even know that was considered to be a problem before." It's going to take a lot of time to actually explore what we have built and figure out what it means. Some people say it is probabilistic; some say deterministic; it's like something in between. It is so different, and I think it will be a good way for us to raise awareness of the technology we have built. We can essentially release it as soon as we are ready. Having this network will speed up the whole development process, and really raise awareness.
    - Investors have not really discovered IOTA. We have been flying under the radar. It is going to be interesting to see what happens going forward.
- Dom: Shimmer will be the first to have IOTA 2.0. The community has been absolutely phenomenal with the DevNet: 300 or 400 nodes at a time.  Hans: We have 15 times more nodes on our DevNet than Hashgraph has on its mainnet! Dom: We got that with no incentives! With Shimmer having incentives built into the protocol, and it being its own Layer 1 network, it will be easier to prove to people that IOTA 2.0 is one of the best DLT solutions out there. And also a way to invite them to build with us. Research papers are a phenomenal way to get credibility, but the best way to prove that everything is as good as we say it is, is by having it on a mainnet, and Shimmer will be the first mainnet to have IOTA 2.0. Hans: People don't care much about papers, even though academic validation is important. The real deal is being live on a network. If someone says it is not going to work, then you can say, "Go break it!" People who say it is not going to work don't have specific reasons-it just sounds too good to be true. We need to show them that it actually can work.
- Hans: When I got into IOTA I did not know much about DLTs and did not realize that what IOTA was claiming was thought to be impossible by most serious researchers. I had a gut feeling it should work, but then it didn't. IOTA 1.0 was falling apart, and for a really long time I was reading all the white papers, looking for somebody who had maybe

worked on something similar, but it did not exist--nobody had come across a similar problem. There were only 2 options: either we were wrong, or the ENTIRE DLT space was wrong, and it turned out to be the latter. They were not entirely wrong, but there is another option to solve concepts that is not based on a total order. If you understand how conflicts work, then you can just vote on the conflicts instead of on time, and it turns out to be much simpler and more elegant. It makes sense-nodes in a distributed network do not have the same perception of time--it makes no sense to build a system based on these (time-based) principles. It is like they are trying to make a penguin fly. Maybe you can do it, but it will not be as elegant, natural, and easy as IOTA will feel. Everything is so nicely structured and separated. You can have meta-protocols: for example, every single innovation that someone could possibly come up with, when it comes to the point of consensus, we can have that as well, but on top of our virtual voting mechanism. . . that's why I usually say it's the best consensus you can possibly ever build because it's so extendable, so dynamic, so flexible that whatever anybody is doing you could do it here as well, but it would be a little more efficient, a little more secure, and a little more robust.

- Dom: We have an entire roadmap of things to try out on Shimmer! We are talking about IOTA 2.0 because that is the main reason for Shimmer, but Shimmer will launch with utility first: a tokenization framework and smart contracts, so you can start building and innovating. We already have several DEXes, such as TangleSea, the NFT marketplace, and some other very exciting applications that have not been announced yet, that will launch in Shimmer. It gives them an early testing ground so that when the tokenization upgrade and smart contracts come onto the Mainnet, the entire ecosystem will be ready. We are starting ecosystem building with Shimmer to grow and accelerate adoption. It will help us catch up to the others. Frankly, we are behind the others right now. We have invested a lot of time and resources into IOTA 2.0, to think through the entire architecture. We are not just building layer 1, but the entire stack, and reinvented the DAG so we have become the most-efficient way to run DLTs on a DAG. Our goal is to prepare for these upgrades on the mainnet, so we already have an ecosystem and already have adoption.
    - With Chrysalis we had to do the entire token migration. With Shimmer we can run through the entire adoption cycle. We can make sure the upgrade process is secure, safe, and seamless.
- Hans: I agree with you that we are behind the competition on adoption because we did not have the utility-you could not do much with the IOTA tokens, so there have not been many builders. Since we are introducing EVM compatibility, a lot of programs and concepts that are successful in other networks can be easily ported to the IOTA network, so I don't see it as a huge downside. I see it as a chance to learn from others and take ideas from here and there. Whatever good idea we find can become part of the IOTA protocol. It gives us a chance to not have to go through the same research and make the same mistakes others have made and just build on top of what others have already figured out.
- Dom: I think Cardano has done a pretty good job, but they have the problem of being built on a blockchain.

    - Hans: Cardano has recognized that in order to scale on smart contracts you need to parallelize the execution of individual smart contracts. It won't scale to have one computer executing all these smart contracts. They think it's an important enough topic to still go this way, even if their tech only supports 0.05 tps per smart contract (which I think is a bit low). If we implemented layer 1 smart contracts (currently not on road map, but I would like to experiment), I think we would have around 5-10 tps, with a network delay of 150-160 milliseconds. I think that would be usable. Any faster is not really useful because price changes too often-faster than you can do anything about it.
    - Dom: That's just on layer 1. The real beauty of what we are building is the combination of layer 1 and layer 2.
- Dom: What gives incentives on Shimmer? It is its own network, its own economy. You will actually be rewarded by staking tokens and securing the network by generating mana. The utility of the Shimmer token will be realized through the ecosystem that is building on top of Shimmer, such as TangleSea and other Dexes. They will be able to experiment, fine-tune and optimize their applications, and build up their own communities. By enabling Shimmer token holders and community members to do yield farming, participate in the ecosystem, and try things out with their tokens. The potential of Shimmer has to be realized by its community. Our focus is on this being an incentivized staging network. The community will determine the value of the network. Community governance will be another core focus of the Shimmer network, with governance DAOs. For example, the community is talking about the community treasury on IOTA, and there will be an upcoming vote. The Shimmer network will be a testbed for DAOs and for the governance of the network itself. The rest is pretty well explained on the website.
- We are going to announce the start of IOTA staking very soon. You will be able to stake your iota tokens and receive SMR tokens in the form of air drops. For every 1 million iota tokens (1 Mi) you stake, you will get 1 Shimmer token every 10 seconds, for up to 90 days. There is no premine-all Shimmer tokens will be air dropped through this mechanism.
- Hans: It's not technically staking. Dom: True. It's kind of a lock drop-you lock your tokens in the Firefly wallet and get the airdrop.

# The AMA

- First question: I understand Shimmer to be kind of a "fight arena" for IOTA, where updates will be validated and tested before reaching the IOTA mainnet. Further down the road, once 2.0 and sharding is implemented on mainnet, won't there then be "two identical networks" in terms of usability, implementations, etc.? Shimmer has inflation and maybe different ecosystems and communities--what else?
    - Hans: as I said, there are several design decisions where it is not clear which is the better version (congestion control is an example). There are good arguments for both versions. With two networks we can just deploy both and see which does better in the real world. So, even if they have the same features, they will be

configured slightly differently. I think IOTA and Shimmer will diverge, but I'm not sure in which regards. The technology for Shimmer is coming from us, but governance will be more by the community, so it may shift as it matures. It can become its own new ecosystem. I think both will be very competitive within the crypto space.
    - Dom: the value is realized through its ecosystem and community, so it should be considered its own distinct ecosystem. People are realizing this is an entirely new ecosystem, at its very beginning, so there is value to getting in at this stage. While they may diverge, the initial focus is using Shimmer to prepare for IOTA 2.0 on the mainnet.
- How is the DevNet going? Any surprises or learnings that came from it?
    - Hans: it is going very well. It looks exactly as we envisioned. Sure, there are some bugs to fix, but when it comes to actual validation of the core concepts, everything works perfectly fine. We have resolved tens of thousands of conflicts already on the DevNet, usually within a maximum of 2 seconds. We could make confirmations 2 or 3 times faster, but it requires more messaging complexity. I think 2 seconds seems to be a good sweet spot. You have a fast confirmation without having to send messages too often.
    - Will consensus speed up on the mainnet, since it has more nodes? No, IOTA's consensus mechanism is a virtual voting mechanism. The amount of network participants is not too relevant for confirmation times. What is more relevant is how the weight of influence is distributed between nodes. If you had 1 million nodes with all exactly the same weight, then collecting statements from each would take longer. We expect that the weight of the network will be somewhat centralized, since that's how it is in all other networks, following a Zipf distribution (which you see everywhere in nature, in society, etc.). If you ever did have a very even distribution of weight, you could address it by having a subset of validators make their statements. In short, I don't think consensus times will get worse-hopefully a little better as we optimize. 1-2 seconds.
- Question for Dom: Is it fair to say that the lack of a custody provider is currently the biggest blocker to get more exchanges in the USA? Is there any progress on getting a custody provider?
    - Totally! The custody providers are gatekeepers that are blocking access to the market. We are working on it, talking to two of them right now. We will see soon.
- Comparisons have been made between Polkadot, Kusama, and Shimmer. Was the vision of Shimmer in a way based on Kusama, and what strengths/weaknesses does the IF team want to keep or solve in comparison to Kusama?
    - Dom: Of course! Polkadot has proven the concept with Kusama, and props to them! They have done a pretty terrific job in launching the network. I remember the first Ether testnet, Olympus network, was also incentivized with tokens that miners & developers received and could later redeem on the mainnet. Shimmer is based on those two concepts.
    - The major difference is that with IOTA and Shimmer we don't have a concept of cheaper transactions, or more staking rewards. The major idea is that it is a

staging network for IOTA. It will be its own mainnet and ecosystem that will validate the technology and give people early access to applications.
    - Hans: There are things like layer 1 smart contracts that we are not sure we would want on the mainnet, but we will try it out and see how it goes--if it scales fine, why not add it to [mainnet].
    - The Polkadot/Kusama relationship is different than the IOTA/Shimmer network. Kusama gives people access to cheaper transactions. The parachain slots are very limited and expensive on Polkadot. We don't have those problems, so the relationship will probably be different, although the overall idea is the same.
- You are planning on bringing Shimmer to exchanges (Dom's post). How will that work when exchanges are already ignoring IOTA?
    - Dom: First, I never actually said that. It is really not our role. This will be up to the community and the ecosystem to get Shimmer listed. We already had some exchanges reach out to us, because the code base is very similar, so if an exchange has listed IOTA it will be easy to list Shimmer. But we are not the ones actively pushing for this. Our objective is technology validation. The ecosystem will bring utility and value.
    - The relationship with exchanges has improved a lot. They are all terribly overloaded. With Shimmer, Smart Contracts, and Tokenization, the value proposition of listing IOTA becomes much clearer. It will allow them to easily list other tokens that come from the IOTA ecosystem.
        - Hans: Recently a lot of exchanges got overwhelmed with all the people trying to withdraw their holdings. They have never seen so many people withdrawing, and they did not have that many tokens on their hot wallet. IOTA will be much more attractive in the future, exchanges will adjust their views.
- Did the EBSI contest influence the decision to do the Shimmer network?
    - Dom: No, none. We just wanted to validate and test IOTA 2.0 before Coordicide on mainnet.
    - Hans: IOTA did not go through a big ICO. When IOTA launched only a small amount was donated (5% of token supply), and they have lived on it since that time. We are doing OK, but we don't have enough money to pay huge rewards for trying to break the network. The only real option was to create a network with monetary value that gives an incentive to try to break it (I don't think they will be able to do it).
- Two staking periods are mentioned: pre-Genesis staking of IOTA, and post-Genesis staking of Shimmer to "secure the network" and generate an APY return. How will staking $SMR actually secure the network?
    - Hans: to be honest, I haven't really looked into the Shimmer network incentive network. Dom: We will have a token distribution before the launch. Hans: That makes sense, but the post-genesis description I have not dug into.
    - Dom: the way it will work is that it is an added incentive to generate mana. With a blockchain, your share of rewards consists of newly-minted tokens and a share of

transaction fees. With Shimmer your staking rewards will be mana and a share of inflation. It is an extra incentive to generate mana, which secures the network.
    - With Shimmer we want to test new concepts and new economic innovations. Staking and earning more tokens by securing the network has been on our list to consider, and with Shimmer we can actually experiment with this. We will share more information on how this will work later.
    - There are some crucial details that still have to be defined.
- For the post-Genesis staking is it “real staking” for tax purposes. Hans: For me it seems that way. The first staking does not seem like real staking to me. But I don’t know.
    - Dom: the way the German tax law is being proposed, an entire country is being excluded from staking, securing networks, and participating in yield farming and DeFi. Hopefully there will be some changes. But we cannot advise on tax questions.
- Will Shimmer amount be shown on Firefly? Yes! It will be very clear. It will be very nice and easy to use.
- Do you have a plan to bring monetary value to the Shimmer network?
    - Dom: Yes. It is up to the ecosystem and community to create value. We know of a couple of dApps that will launch. We will launch the network, but the rest will be developed by all of you. It is an exciting chance to build your brand, build your application, build your ecosystem and community.
    - Hans: If it has utility it will be worth something. There will be people trying to buy cheap really early. It may not be worth much, especially at first, but as people realize that it works and is secure and is not going away, it will draw people in. It is even possible that staking is so appealing that the new network could become worth more than the IOTA network. We don’t anticipate that, but it could happen. What is nice is that everyone who holds IOTA can participate.
        - At the end of the day this is a community project
        - Shimmer is meant to accelerate the adoption of IOTA and bring these changes to mainnet.
        - If staking rewards prove to be a big success on Shimmer, we would leave it up to the governance of the ecosystem and community to decide whether to include that on the mainnet.
        - Shimmer will launch with tokenization and smart contracts
- Will there still be a bug bounty? Relying only on attacks does not cover all kinds of bugs.
    - Yes, there will still be a bug bounty. We are trying to think of ways to incentivize hackers through decentralized exchanges. If you have ideas of how to incentivize, please share on Discord.
    - If there is a vulnerability people have an incentive to exploit it if the token has value.
    - It is going to be a bit of a risk for exchanges to list this token when everything is really new. Maybe smaller exchanges will start first. That is what happened with Kusama, and it started very cheaply. Some people were smart and bought it very early (and became wealthy in the process of holding). It can happen relatively fast.

    - I think concepts in our consensus are relatively simple. It's not really completely unknown to people who understand how blockchain works. It will be reasonable to assume it works ok. Of course, there are always theoretical issues that could arise. I feel relatively confident that if there are no bugs in the code itself it will be straightforward for exchanges to implement.
- Long-term monetary policy? Shimmer has staking, and you have mentioned network incentives. Which model is better for the Tangle? ETH's model of minimum-viable issuance, or Bitcoin's tapering rewards?
    - The long-term vision has been a fixed supply, but there are real economic considerations. They say moderate inflation is good for society because it prevents people from hoarding and encourages reinvestment. There are debates about whether a deflationary currency is a good thing. You can't really say, since these things have hardly existed for any length of time. I am no expert on these large economic questions. Personally I think a system with moderate inflation might be better, but I really don't know. I wanted to highlight simply that this should be open to discussion since we have changed basically everything from the early design, so maybe we should have discussions about incentives. Maybe it's good to have for a time and then fade out, like Bitcoin. We can test different models with Shimmer so instead of personal opinions we can rely on real-world tests.
    - Dom: Every decision we have made since the beginning is fair to be questioned. We need to look at data. With Shimmer we also want to examine tokenomics and figure out the best approach. That's why we are launching with staking and incentivization. We actually will be working with economists and inviting them to the Shimmer network to help find the best model.
- Do UTXO output types need more testing? And ISCP?
    - UTXO does need more testing-it adds some complexities to the network. Smart Contracts are actually more straightforward. Shimmer is there to test and validate everything about the network.
- Wen?
    - We will share more about the start of staking SOON. We will invite the community to test out the software. If you download the plugin for hornet node you can validate staking rewards. We will do an audit on Firefly. We may do 48 hours instead of 24 hours announcement. We want people to prepare for staking now by getting your tokens to the Firefly wallet. So far that is the only way to participate-no exchanges have said they will support staking.
    - There will be a lot of creative ways to empower all of you to participate in Shimmer and grow it together. Our job at the IOTA Foundation is to empower the community to have the right tools, technologies, and the right token incentives to grow and build these huge ecosystems. We have great aspirations for the future and we feel confident we will be able to take on the world with IOTA Smart Contracts, IOTA 2.0 and output types and everything that comes after that.
- Any final words from you, Hans?

    - Someone just asked if the final consensus model will need proof of work. No, it won't. Maybe it makes sense to have a very small amount of proof of work, but in theory the congestion control mechanism should handle spamming without proof of work.
    - We could do a dedicated stream about congestion control.
- Why such a big reward for SMR?
    - Hans: I don't think it is such a big reward--you need to stake 1 million iotas to get 1 SMR token (every 10 seconds). I think total supply will be 25-50% of the IOTA supply.
    - I have not migrated yet! I need to find my Ledger! Hopefully it's not lost . . .
    - Dom: You should definitely do that now. You need to get ready for staking!
- Hope you have a great Monday and rest of your week. We have some good stuff we are working on. If you want to reach out to us, just do so on Discord. We are all community members.