
Episode 157: Episode 157: Arthur Gervais on Crypto Micropayments

Kelley Weaver: Welcome to Crypto Token Talk, a Crypto 101 podcast exploring how blockchain applications like Bitcoin, Ethereum and other crypto assets could change the world. Learn from blockchain experts, thought leaders, and founders of some of the most innovative companies and world-changing ideas of our time. I'm your host, Kelley Weaver, CEO of Melrose PR, a leading blockchain communications agency. Thanks for joining us today.

Nikki Brown: I'm Nikki Brown, Senior Content Strategist at Melrose PR, and I'll be your guest host of this episode of Crypto Token Talk. Today I'll be speaking with Arthur Gervais, founder and CEO of Liquidity Network. Welcome, Arthur.

Arthur Gervais: Hi Nikki, so happy to be here.

Nikki Brown: Great, well let's go ahead and dive right in. First, can you provide us with a brief introduction to who you are and what you do?

Arthur Gervais: Sure. I'm a computer scientist by profession, I would say. So I started security when I was 16, so IT security when I was 16 and did a computer science degree, as well as a PhD on blockchain technology at ETH Zurich in Switzerland. I started full time in the blockchain space in 2012. What basically attracted me in the space, and is still motivating me nowadays, is security. Because, ultimately, it's all about changing your trust assumptions from a centralized entity to a network of people that you don't necessarily have to trust. So it's all about shifting trust assumptions.

Nikki Brown: Yeah, given that you've studied this in-depth, you got your PhD in this subject matter of blockchain security, what are the most exciting applications, do you think, of blockchain technology?

Arthur Gervais: I think the most exciting applications are of a financial nature; this means the transfer of assets, of digital assets, the exchange of digital assets, whether these are utility payment or security tokens, for instance, and that's probably the biggest application, at least so far. As I'm sure you're aware, there are a lot of gambling applications out there that are fun to see coming and other different

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hourglass models. I find it very funny that some applications that are being taught in psychology and in game theory trials are being tested real life on the blockchain.

Nikki Brown: Okay, great. A lot of our listeners are somewhat new to blockchain and cryptocurrency and all the lingo. What do you mean by hourglass models?

Arthur Gervais: Oh yeah it's just a reference to the ... Maybe you've heard of this promo 3D game. It's, I think, a dual-sided pyramid game. It's basically like a pyramid because the earliest you come in, the better for you as a participant in the system. However, if you go out, then it's also bad for you, so it's like a reverse pyramid on top of a pyramid. It's just a kind of a gambling application. I'm not an expert on gambling. I'm not working in the space. I just see that people are very excited in the blockchain space about those types of applications.

Nikki Brown: I see, got it. So let's talk about Liquidity Network. What is it and what led you to found it?

Arthur Gervais: Right, so current blockchains such as Bitcoin, Ethereum, they are open, right, permissionless, and that's great, right. So this means you can do transactions without having a bank account, and nobody can freeze your funds. This is the definition of, in a sense, permissionless. You don't need anybody's permission to use it. It's very good for, still today; it's very good for the transfer of higher amounts of high-value assets. However, you can't do micropayments anymore today. If I want to send you, I don't know, I want to tip your podcast now, for example, a few cents for this particular question that you asked, then I cannot send the transaction on Bitcoin or Ethereum because I would be paying probably more in terms of transaction fees.

So micropayments are somehow no longer enabled, and this is limiting the amount of usage, use cases that we can have on Bitcoin or Ethereum. Also, if you want to get more users adopted, so if you want to go toward mainstream adoption, you just need to have the ability to scale towards more payments, significantly more payments, not only on the orders of tens per second, as is the current state, but on the other thousands per second.

That's why I worked on Liquidity. Liquidity is enabling, I would say, slow blockchain, such as Bitcoin and Ethereum, to scale faster. This is because we can perform transactions as ... Well, you can think of it schematically, or from the architecture point of view, as one layer on top of the blockchain; so it's on the

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second layer. On the transactions that you perform within the Liquidity Network, can be aggregated and checkpoint to the underlying blockchain at periodic intervals. This periodic checkpoints, maybe the costs are negligible, whereas on the upper layer, in the Liquidity Network, we can do millions of transactions.

Nikki Brown: Wow. How is that possible, the ability to do millions of transactions? Is it because you have this off-chain aspect to it?

Arthur Gervais: Right, you can think of it like a prepaid card. If you charge a prepaid card, you're going to put 10 bucks on this prepaid card, and this prepaid card has its own particular provider, right? Then you're going to use it, and you're going to make a few transactions, pay 5 cents, 10 cents, 5 cents, 1 cent, et cetera. Maybe you do like a hundred transactions.

The provider that you have this prepaid card with only needs to settle once, right, because all the transactions that you do with the provider are kind of off the chain, or off the record. This is, I would say, a reasonable analogy to the Liquidity Network. All the transactions that you do with Liquidity, they're, in a sense, merged together into one transaction. That's basically a novel protocol that we developed. It's called NOCUST. There's an academic paper that you can check. It's full of notation and scientific acronyms, but it explains very much the security assumptions that we have.

Nikki Brown: Okay, very cool. I also read on the website that off-chain payments offer better privacy than on-chain payments. Could you explain a little bit about why that is?

Arthur Gervais: Yes. In a payment, if you do a payment over Liquidity, there are typically three parties involved, as of now. This is the sender, an intermediary, which is our payment hub, and the recipient. The user in the future will be able to choose whether the transaction that he's performing are being published or not. Because only the sender, the hub, and the recipient are involved, those three parties, the user can potentially choose to, "I don't want to publish my transactions," so that the hub will not publish anything about its transactions. Well, the recipient probably will not either, and the sender chooses to not publish anything.

If you look at current blockchains, like Bitcoin and Ethereum, if I do a transaction to you, I have to broadcast it, right? I need to tell it to everyone. Otherwise, the miners won't include it into the blockchain because they don't receive it. If I just

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send it to a particular miner, then the miner will put it in the block, and the block, later on, is broadcast, and everybody will know about it because it's in the block.

Nikki Brown: Do you think that ... Because we so often hear about blockchain is this bringer of increased transparency because you can see all the transactions. Do you think that that's not practical, or do you think there are certain occasions where that is a good thing, and people should have the choice, or what's your philosophy behind giving people that option?

Arthur Gervais: From a practical point of view, I believe Bitcoin can be adopted, or it has a hard time of being adopted as a everyday means of payment because of its privacy violation in that sense. I don't want to receive my ... Or most people probably don't want to receive their payment at Bitcoin, so that everybody can see how much they get and where they're going to spend it afterwards. It's literally public right now, and this is very like a big obstacle.

I'm aware of research, active research that is trying to solve these things. There are already a few approaches like ZCash and Monero, but there are others like, PRCash, that are being currently developed. On the underlying blockchain layer, I'm sure there will be some innovation coming, also within the next months. Liquidity is on a layer on top and, basically, because the transaction really only needs to be done within three parties, that's all scalability measure, in a sense, because if only three party are involved, this is quite fast, right? You don't need to involve the global broadcast, like in Bitcoin or Ethereum.

The privacy guarantees, however, have a drawback in Liquidity. If you choose your transactions to be private in Liquidity, then the user needs to be online, at least currently, at least every 36 hours. This is actually a security parameter. You might ask why does he need to be online? Basically, he needs to be online in order to verify whether the hub has committed the right state to the blockchain, so that the hub didn't misbehave, in a sense, right? So that's basically the requirement. If a user chooses to publish its transactions, then someone else can audit the account balances on his behalf, and then there is no online requirement, per se.

Nikki Brown: Fascinating, wow. Going back a bit to what we were talking about earlier, you mentioned you see financial applications as being most relevant to blockchain technology and the uses for it. We talked about micropayments, and you said that you could choose to tip this podcast right now. That would be one example

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of a micropayment. What are other use cases for micropayments that you see coming to fruition in the next couple of years?

Arthur Gervais:

Right, so generally, like a tipping system, a global tipping system, in a sense, that can be integrated in any type of social media would be great, that is not kind of sensible. I mean it is not able to, that's not possible to be censored by a central entity. I believe that there are some projects working on changing the way that we see content on the web and advertisements. I believe there could be a potential market there.

There could be a huge market for pay per view. I'm sure you're aware there are a lot of gaming videos that are being streamed nowadays, so they could be pay per view, or pay per second in a sense. Every second you pay a fraction of a cent, as a transaction, just to just continue seeing this particular stream. I believe there are many opportunities where entrepreneurs could benefit of this settlement system, but probably the one that will be the most impactful is the inclusion of emerging markets.

Nowadays, there are millions of people without bank accounts. They simply don't have the means. They can't trust their government. They can't trust the banks. What they nowadays need is simply a smartphone, an Android or iPhone, whatever they are able to afford. They can use Liquidity, for example, with the internet connectivity that they might have locally. What's possible then is that they ... I mean as soon as they install an application, such as the Liquidity app, they can transact. They can receive payments already, and they can forward payments to their friends. They could pay locally to their merchant, and I think this inclusion or this enabling of emerging market is huge.

Nikki Brown:

Definitely, and not just paying locally within their region, but enabling cross-border trade, and allowing people to participate in the global economy, right?

Arthur Gervais:

Very much, yes. They will be able to participate in decentralized exchanges that accept Liquidity transactions without paying transaction fees, right? One thing that I didn't mention, which I believe is also very important, and this is actually steering businesses currently away from the very old [inaudible 00:12:33] blockchains, is the volatility of transaction fees.

How do you build the business if you don't know how high the Bitcoin or Ethereum transaction fees will be next month, right? If you can't calculate, or if you can't hedge this risk, how can you build a sustainable business, right? It's

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not possible. With Liquidity, you know in advance, how high your transaction fees will be because the operational costs for Liquidity are, for us as Liquidity Network, currently below \$100 US per month. That's quite low, and this is irrespective of the number of transactions that users will do on top of Liquidity.

This means that what we can provide is kind of a service level agreement to businesses, and they know if they use our layer that is on top of the blockchain, they can basically foresee their transaction fees, or how much they would need to pay, at most.

Nikki Brown:

Wow, no, that is amazing that the operational cost is so low. Is your main audience right now, the people you're trying to reach to use the Liquidity Network and the Liquidity mobile app, would it be entrepreneurs and businesses? You also mentioned emerging markets and the benefits to people in developing regions, that maybe their government's currency is so volatile that cryptocurrencies might be a welcome alternative. Who is your audience for the Liquidity Network?

Arthur Gervais:

Yeah, thank you for this question. Our main audience are actually people that would like to integrate feeless transactions. We see our value and our strength in providing the backend of a non-custodial financial activity ring. Non-custodial because we do not hold any of the users' keys, right? It's just a typical Ethereum or Bitcoin.

We operate in, for example, the backend for the payment system. We are taking care of the security, the availability, and developers can then, for example, use our STK in order to implement Liquidity payments within their applications. So if you have, for example, a tipping application, you can include this. If you have a podcast and you want to be paid per episode, then you can include that. If you are an exchange, and you would like to provide off-chain crypto, then we can talk about this also.

We're basically trying to ... We're aiming on common use cases that try to use blockchain for a particular use case; for example, tipping, for example, a wallet in emerging markets. We see our strength and value, added value, in the infrastructure platform provider.

Nikki Brown:

Great. You touched on some of this, and you have the app, which is, of course, available at the Apple store, for sending and receiving ETH. What's next for your team in the development process?

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Arthur Gervais:

The application that we have developed is to show people how to use the Liquidity Network, and how other developers could benefit from our backend, and to do feeless transactions. Next steps is on Sunday we're going to release in the test net mode, a decentralized exchange. What's special about this decentralized exchange is that it's unlike every other decentralized exchange out there.

A current centralized exchange has two components: an order book, and a settlement system. EtherDelta was the first decentralized exchange. EtherDelta had an on-chain order book, and it had an on chain settlement system, so it was quite slow, right, because is on the chain and on Ethereum. The current stacks are a bit more optimized. The order book is off the chain, so they have some kind of matching order book, reserve system, but the settlement still is on the chain.

What's now special about the Liquidity decentralized exchange is that both the order book and the settlement, they are off chain. As such, the Liquidity exchange can scale to transaction exchange speeds off centralized exchanges while being not custodian.

Nikki Brown:

Great. Wow. I think a lot of people who are new to this space don't quite understand the difference between centralized exchanges and decentralized exchange. Even the fact that Coinbase, that's the first platform that a lot of people use, is centralized. Do you mind talking about that distinction, and why it's important for people to know about that?

Arthur Gervais:

Yeah, I believe it's fundamental. I think the banking system started in Mesopotamia many years back. It has always been custodial, the banking system. This means that there was always a central entity that holds their users' funds. They are legal contracts, right? Those define that you own those funds that are being held by a third party, but as you know with legal contracts, sometimes things go out of hand. You have seen that their governments, they're taking funds anyway and banks are closing down. Also, there are some provider, bank providers; they are censoring transactions. They're not allowing you to perform certain transactions, and this is inhibiting innovation. This is difficult for emerging markets.

What Bitcoin is all about is to bring a non-custodial financial intermediary into the world that could be used by anyone. You can open a Bitcoin or Ethereum wallet without having a bank account. You don't need to do KYC, know your

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customer. You don't need to do AML, anti-money laundering checks. This is simply because, as a user in those networks, you are custodian, and not a third party.

This is fundamental, and this is why I'm actually working in this space because I believe it's great to construct non-custodial financial intermediaries. We're kind of building a bank, but the bank doesn't hold their users' assets, it's put in a term, I would say. This, in particular, if we look at exchanges, is fundamental. I'm sure everyone has heard of a centralized exchange that got hacked, and once centralized exchanges get hacked, it's very likely that the users' assets are gone. There are some good example where that's not the case, but it's very critical. For decentralized exchanges, it's different because it's actually the user who holds the assets. It's not a central entity.

Nikki Brown:

Thank you so much for that explanation. I agree it's fundamental to what Bitcoin and cryptocurrencies and blockchain technology is all about. I think it's really important to have people understand that. What do you think the future holds for these emerging technologies, for cryptocurrency and blockchain-based applications?

Arthur Gervais:

Yeah, I'm pretty curious what's going to come next. I am seeing, slowly, that there starts to be a bit more clarity on the regulation side. If we are not looking at tech side, I think the regulations are probably one of the more scary things for businesses, because there's so much uncertainty and everybody feels like be in a gray zone we're operating.

What I can see is that there's a bit more clarity, at least for now, if you're providing, for example, a wallet that is non-custodial, or like a trading system that is non-custodial, then, therefore, example, no KYC or AML checks required, which is very interesting. This enforces on the possibility that, unlike a bank nowadays, ... And I think a bank could very well have its traditional custodial activities, but it could open a new market segment, right, where it offers non-custodial services that are very similar to a traditional banking service; simply that their bank doesn't hold their users' funds.

As soon as we see a bit more legitimacy in this area with those services, I think this will be very interesting. This would enable, actually, the inclusion market, which markets that this could be huge for their development. I would really look forward to this.

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Nikki Brown: Fascinating stuff to think about. Great, anything else you'd like to add to this conversation?

Arthur Gervais: No, I think you have asked very good questions, and thanks for those. I'm more than happy to get feedback on how we could build, basically, better STKs for developers. This is our current focus, so if anyone wants to give us feedback on this, I'm more than happy to take that.

Nikki Brown: Of course. What's the best way for people to get in touch with you, either for feedback or just to stay up to date on what you're working on?

Arthur Gervais: If you want a direct discussion, and you're asking questions, the @LiquidityNetwork Telegram group is the best to go. I'm there, and my team is there visiting. So, if there are any questions, in particular, the technical questions, I'm all for answering those. If you just want to have regular updates on our development, I believe the easiest is to subscribe to our newsletter, which is available on our website. It's a bi-weekly newsletter about everything that we have been doing in the last weeks.

Nikki Brown: Excellent. Well, thank you so much for taking the time to speak with us today, Arthur. We really appreciate it. I'm Nikki Brown, your guest host for this episode of Crypto Token Talk.

Kelley Weaver: That's all for today's episode of Crypto Token Talk. To learn more about blockchain and keep up to date with this fast-paced industry, subscribe at [Cryptotokentalk.io](https://cryptotokentalk.io), where you can also find today's show notes. If you have suggestions for topics or guests, please drop me a line Twitter @cryptokelley, or you can follow the show on Twitter @cryptotokentalk. If you enjoy this show, please rate and review it on iTunes and share it with family, friends, and colleagues who want to stay up to date on how blockchain technology is changing the world. Thanks for listening.

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