



Blockchain Brad Interviews Ingo Rube: Essential Credentials for Web 3.0

KILT Protocol: Essential Credentials for Web 3.0 | Trust Enabler | Universal Blockchain Protocol
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Part 1 of [Brad Laurie's wide-ranging conversation with Ingo Rube](#) covers the below topics:

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Brad [00:00:06] Hello, it's Brad Laurie, I'm Blockchain Brad. And today I'm honoured to speak with the founder and CEO of KILT Protocol. His name is Ingo and he's here to explain everything that we possibly don't know yet about KILT and what they're actually building and have been building for some time. So Ingo, thank you very much for being here as the lead of this very challenging endeavour.

Ingo [00:00:27] Hello. Thanks for having me.

Brad [00:00:28] You're very welcome. Now, in transparency, it's important that all of you know this is entirely free. And obviously I know KILT. This is about making sure that there really is key information from the source. And that's from Ingo himself. No better than the CEO and founder of any team anywhere in the world right now in blockchain.

So let's talk about something that isn't really talked about a lot Ingo, and that is credentials. Honestly, it's a very complicated topic. A lot of people really haven't dug deep, I don't think, yet into KILT, and they don't tend to do that until they start to see financial reasons to do so. So let's start early. Let's explore for the right reasons. That's the tech ones. Why do we need to explore credentials in the context of Web 3 and blockchain Ingo?

1. CREDENTIALS

Ingo [00:01:09] So the credential is something you all know. You have a lot of those. Normally they come on paper or on plastic. So for example, your identity card is one, your driver's licence is one. And also if you have a university degree, you've got a piece of paper from the university. This is a credential. Also, your key which opens your door or your car, this is also a credential. So credentials are all around us basically, but normally they are not digital. Normally they are somehow physical. And we were exploring this thing from the side of the digital identity.

2. IDENTITY

Ingo [00:01:43] So I think everybody agrees that digital identity is needed in digital systems. So we need to know who to talk with. We need to know if a service is actually the service it pretends to be and stuff like that. So there's a huge need in identity. And when you look a little bit into identity, you can actually see that identity consists of two things. The first thing that you need is an identifier. So in this call, Ingo would be a nice identifier for me because I'm the only Ingo here and if Brad says "Hi Ingo", I know that it's going to me. But this is just an identifier and it doesn't say anything about me. So this is not identity. This is just an identifier. It's just like you put a QR code on an egg or you put a number on some packages or whatever. It is, it doesn't say anything, it's just a number.

And to have this become identity, actually, you need to put something more to it. So how does my identity grow? It grows with credentials, actually. So, I'm European, for example, I have a European passport, so that makes me European. And this passport mentions my identifier again. It says Ingo. So I can show it - this is Ingo, this is Ingo - this is part of the identity. Also, I can drive a car. This is why I have a credential for driving cars. I also have a company here which I can prove by having somebody look into the commercial register of the city I live in. And I also have a university degree and if I go to look for a new job, I might want to show this because then the guy trusts me, obviously, that I can do something, especially in computer science, and this is how my identity actually grows.

And if we want to have digital identity, it's not enough to just have the identifiers and give everyone a name because then you don't know anything about those things, it's just names. You have to put credentials to it and you have to have the credential in a digital representation. And this is why we need those verifiable credentials - that's the name for that - in a digital representation so that we can link them up to identifiers. And identifiers plus the credentials together form an identity. And this can be an identity of a person. It can also be an identity of a machine. It can also be an identity of an IOT device. It can also be the identity of a service which is just running in software. Right? So to build digital identity, we need those credentials because otherwise it's just pure identifiers. And that's boring and doesn't help anyone.

3. USE CASES FOR VERIFIABLE CREDENTIALS

Brad [00:04:31] Well, let's explore this also in the context, because the reality is that you want to have key use cases. You've been building this for some years and we've already seen in the blockchain arena DIDs, or those decentralised digital identification markers, nice experimentation on the blockchain emerge for real use cases. But one of the things that hasn't come, perhaps so much, is the credential component that must happen. So in the context of, I guess, real world business and real world applications and more importantly, all the way to the very top of government, surely Ingo, this is really limitless in how this can be applied in this Web 3 arena. And obviously the blockchain is crucial to innovating, otherwise we're just reinventing old wheels.

Ingo [00:05:16] Exactly, so it's not... Actually what we do is protocol development. And if you do protocol development, it's always very wise not to have a specific use case in mind.

Think of Tim Berners-Lee. He invented the http protocol. Nowadays you can sell your bicycle via http. This definitely was not Tim Berners-Lee's goal, right? So if you do protocol development, you have to do something which is basically open for millions of use cases. Otherwise, it's not going to be successful. So we were thinking in the beginning, shall we maybe go into some vertical? Should we concentrate on DeFi? Should we concentrate on government? Should we concentrate on whatever? And we said actually that would be the wrong way. Let's be completely open.

And it now turns out that this was basically quite a good idea. Because now we have this base technology out there. We see use cases popping up left and right from us, which is really, really cute because we never thought of those things. So people come there and say, hey, can we do this for certificates for allergens inside food? And we never thought of that. And then people have come up and say, hey, we're trying to make a genetics service which doesn't store the genetic information about the people so it can't be misused. Actually, you could do that with credentials can't you? And then we say, yeah, actually, you can. That's cool. And so, there are use cases all around us. And the cool thing is that we just concentrate on building the protocol and making it so flexible that everybody can possibly use it and then people around it build the use cases on it.

Brad [00:07:05] Yes. And that's why I'm so excited about it, to be honest. I've been tweeting about this for a while and following you along because it really equates to, in many respects, the TCP/IP of credentials aligning with identity for really limitless use cases that aren't specific to KILT Protocol itself. But in that context, I wanted to talk you through a few terms related to this universal potential of the protocol, such as self-sovereignty, the anonymity and the verifiability or the verification aspect. You mentioned that already, but they are key components to building this, I guess, universal protocol, because that's really what it is from the outset.

4. SOVEREIGNTY

Ingo [00:07:44] Yeah. So let's dig into sovereignty first. So I think sovereignty is one of the most important things when you look at the internet as we see it today, and this is where the Web 2 and the Web 3 actually differentiate a lot. So when you look at digital identity in the Web 2, this identity is basically held with big companies. I don't want to mention names, but they're mostly in America. And so how does it work? So if you want to log into a huge social network, actually what you choose is a username and password, which is an identifier. Right? And then they look to see if the username is already taken, if the password is long enough and whatever. And if everything is fine, then they say, OK, this is now your username and password and you've got an identifier.

The first problem there is actually that they know your secret and you know your secret. Actually, you have a shared secret. From a security point of view that's not so cool. What happens then, is that you start to behave on this social network and this aggregates data. And this aggregation of data is actually the credentials. This is your behaviour and this aggregates not with you, it aggregates there. Right? It aggregates on their database. And then it becomes really, really dangerous because it's not only your data that's aggregating, everybody's data is aggregating there. So this is a huge honeypot for hackers. If you just hack in once and you've got all the information, pretty cool - for the hacker, not for the others.

The second thing is that this aggregates a lot of power with this social network because the social network then goes and says, hey, we got a messenger service as well. If you want to log into the messenger service, you can just use your identity or your identifier you have from your social network. That's so convenient for you. But in the end, it's all put together to one database and they have more information and they can start selling and misusing it. And there's a huge, huge danger in that.

And the biggest danger is actually, if you have a better idea of how a messenger should work, how will you ever go to market? Because they can already say, hey, you have your log-in there already, it's so convenient. And so they're aggregating more and more users. And better technologies, brighter ideas will never come to market because no one is going to finance them because they don't have the users. Right? And that's a huge thing, which is which is hindering innovation. And so we have to somehow stop that.

5. TRUST & TRUTH

Brad [00:10:22] Can I just jump in there and ask you this in the context of trustlessness. We hear that a lot in DeFi. We hear that a lot in the broader blockchain speak. But you're embedding a layer of trust within the framework so that all the engineering that is afforded by blockchain for trustlessness, so that any entity from top to bottom, grassroots or otherwise, governmental or enterprise, can actually start to engage. But with the security and provisions of trust built in for proper applications and use cases that we know can then be utilised in business, even.

Ingo [00:11:03] Yeah, that's it. I think this is a complicated thing people have to get their head around. Because actually you're completely right. What we're doing in blockchain is we produce a trustless system. What does a trustless system mean? Trustless means basically, we exchange trust with the mathematical truth. So if I have a Bitcoin and I see a Bitcoin on my balance, this is mathematically calculated. I can be sure this is my Bitcoin. Right? So this is truth. When I have a dollar in the bank, I can see my balance there, but I have to trust the bank that their database is actually working well and that they give me the dollar back in cash or whatever. So this is trust.

So we have a truth system in the blockchain and we have a trust system outside the blockchain. So we can state that. But then also in our culture, we need some kind of trust. And this kind of trust is represented normally by entities. This basically starts in the beginning of your life. At first, you trust your parents. You can't get away from that.

Maybe 12 years later, you start doubting this trust, but in the first 12 years and it's just trusting that. And then we are educated to trust institutions. Some people trust judges. Some people trust governments. Normally you trust universities. And it's not going to go out of our culture. So when I have an employee who wants to work here and he shows me a university degree, then I will actually look at it and say, OK, I've heard of this university. This is a good university. I trust this university or what they do.

And of course, then I would like to have this employee here because he has this nice piece of paper. So this trust between me and the university is probably not going to go away just because we have a new technology here.

Brad [00:13:03] Right. And... sorry, go ahead.

Ingo [00:13:07] And if we want to implement something like credentials, we have to recognise that those structures are there. Right? So we have to give the university a chance. The trust relationship between me and the university is something that happens in the real world.

So this is a trust relationship, this does not have anything to do basically with the blockchain. But you could actually also make your university diploma yourself and just show me a fake one.

And this is what we can actually prevent with the blockchain because we can – and this is what KILT is about – we can store a hash of this credential on the blockchain so that it is absolutely mathematically true and verifiable that the university actually issued this credential and issued it exactly to me. And this is what we can find out, where we can produce the truth upon.

Brad [00:14:04] This is so awesome. I want to jump in here because this does this at a level that really hasn't been done before in terms of finite trust, provable by blockchain, provable by code. So rather than trusting people and systems that sometimes can be flawed, this can be a better way, arguably for the future of any system, whether that be open source design for the people with no enterprise, endeavour or otherwise.

The great thing you said there was that there is this true, valuable synergy between the blockchain's trustless design that's provable and verifiable through the chain itself and then coupled with credentials that we absolutely need in society. So that's a really innovative thing. I think that has the potential that we really haven't explored yet globally.

6. ANONYMITY

Brad [00:14:50] So that verifiable aspect that's nuanced by the blockchain. You've also referenced the importance of sovereignty as well, self-sovereignty. But what about anonymity? How does that fit into the context as well, especially when that's had a bad rap Ingo, at the beginning of the blockchain movement, when the governments tend to be quite averse to anonymity sometimes.

Ingo [00:15:11] Yes, I think anonymity is something that comes in different flavours and that has to be provided in different ways. So, for example, take a real world example. So I want to get into a bar and I have to be eighteen for that. So I choose one of the credentials I have in my wallet, which is probably my driver's licence. And then I show this to the bouncer. And the bouncer actually needs to see the picture so he can see that the credential matches the subject. And the bouncer also has to see my date of birth, obviously, so he can find out if I'm eighteen or not. And he definitely doesn't need to know my name. Right? So what I can do is I can put my finger on the name and then he will still let me in. He will not know who I am, but he will see that I'm eighteen. This is what we call selective disclosure.

This is one part of anonymity we have to provide and this is also something that KILT can provide. So if you have a credential and this has four different things in it, you can choose which parts you show. So that's one thing.

The other thing that is important is that it must be possible for you to show up somewhere and prove something and then show up again and prove it again or prove something again without the verifiers, the bouncer in that case, knowing that it is you again. This is needed for many different DeFi applications and this is also something that we implemented. So I come to you and say, hey, I have a cat, I can prove I have a cat. And next I come back and say, Hey, I have a cat. You say, OK, he has a cat, but you don't know that this was the same person. That is something that is also especially needed around blockchain projects.

So those things around anonymity have to be provided. And that's necessary to get to the general acceptance of a system like that. Otherwise, it would be absolutely open to anyone to read that and that wouldn't fit with data security.

And sovereignty is also something that plays into anonymity, because when I have the sovereignty over my credentials, and this is what you have in a blockchain-based system and this is what you also have in the real world system, like with your real wallet, then I choose who I show which credential to and which part of the credential I show.

Brad [00:17:50] That's a huge thing because many, many different parties want to be selective.

Ingo [00:17:55] Exactly. So this is why we need those features as well to be useful for a variety of use cases.

Brad [00:18:05] Yes, I mean, it's immense what you're talking about. I mean, it really is immense because, again, it's that standardisation. For those who aren't really understanding perhaps yet, that's a keyword, wouldn't you argue Ingo, is that you are a standard as a true protocol.

Brad [00:18:21] But I would also suggest that you're going to be more than that, because whilst you are the protocol, you're building in specific potential, specific, technology, specific, perhaps even products, who knows - you're going to teach us this - that really build out more than a protocol, but a whole platform. Because there's a lot going on for the standard protocol that can be applied to a vast amount of use cases. But I wonder, from you, are you thinking of specific ones that really capitalise on the potential of this protocol?

7. SOCIAL KYC

Ingo [00:18:50] Yeah, I think there are things that we already see which are going to have a very big potential. So, I think we're KYC-ing is one thing that really has to be rethought in the world. And everybody's really unhappy with KYC. That has to do with every country having a different legislation around it. This has to do with basically every bank or whoever you deal with has a different view on what he should do and what he shouldn't. It has to do with being really annoying for people when they are around in the DeFi space to KYC basically every day. So that doesn't make a lot of sense right now. So something has to be done about that. And we see the first projects coming and popping up and we are part of those projects.

For example, together with the companies, Polkadex and Fractal, we just started a really, really nice thing where we provide the KYCs from a well-known KYC provider as verifiable credentials which are in the possession of the user. Not only the KYC. You do the KYC and then the data is owned by the bank or by the service you signed up to. This is basically stupid, actually. You should have that because then you can reuse it. Right? And you don't need to make the KYCs again.

We also working on a project called Social KYC, which I think is going to be really important. Because there's not only the government KYC, it's also possible to do social KYCs around there, which means that you actually prove that you have access to different accounts like a LinkedIn account, a Twitter account, a Riot account, a Github account and your email address. And if you prove that you have all those accesses and if you store them in a credential, you can actually send people out there in the internet something that is basically much more valuable than a KYC which is issued by a government's thing. Right? Because..why do I want to know where you live? Actually that's really not important to me. But if I know who you are on Twitter, who you are on LinkedIn, who you are on three or four social networks and know your email address and your phone number, then I actually know who I'm dealing with. And if you can prove to me that you control all these accounts, then I'm pretty sure I'm working with you, right? That's much more valuable.

Brad [00:21:28] Exactly. And you're opening this up so that someone like me or anyone really who wants to engage with the open source nature of the code - and that's what I wanted to check with you - can start to tinker with this and start to almost personalise it or to make it their own.

And something quite unique because we haven't seen that kind of access in the past before either, especially in the context of credentials and especially in the context of systems that are built. And often they're for people but not available as readily, as easily. So in that, where's the value for this Ingo, when it comes to open source tech as opposed to proprietary? Given that this is in the spirit of block chain, how much of the protocol itself, through the GitHub, through the access, through the nature of open source, is available for everyone to interact with? And can it be forked? Can it be appropriated?

8. OPEN SOURCE

Ingo [00:22:20] So, what we do is 100% open source. So anything that we produce is always open source. So as soon as it's released, it's also open source. I think this is a necessary component in the blockchain world. If you build something on blockchain and then it's not open source, then who will trust you actually, that you don't put traps in that? So that's a precondition. I don't think there are many blockchain-related projects out there which have closed source components, and I wouldn't trust them, actually.

Brad [00:22:54] Thank you for letting us know that. So where does the value sit in then for you? So we clarify this because you've been spending years with your team on this code. You've been building this out for a very specific value universally for, as you've mentioned, limitless potential. So how does KILT as a team capitalise on the protocol?

Ingo [00:23:15] So we capitalise like any serious blockchain project just by producing our own currency. That's what we do. So we don't take any fees for licences or data from people and sell it later. We're not going to go into the service thing. Because I think that an open source project actually works best when there are integrators around that. We have seen that in the past. So successful open source projects actually concentrate on their open source product, which is in our case, KILT Protocol.

And then around that you have people with bright ideas who want to build great services on that and have their own business models. And you have to encourage those guys actually to build the software. And then they can earn money with it and there must be different, multiple business models possible on top of that. While we stay very small, stay in our corner and just build the KILT Protocol.

Brad [00:24:24] So you're the lean protocol team. And you also alluded to that important economic aspect of this. I mean, that's the true utility fuel. The reality is that token economy is really important to the dynamics of how this can play out to enable everyone to engage with this, but also be incentivised. This is something quite revolutionary, I would think, given that this is something that people can then take to build out their own credential needs. They can add them in and embed them into their own technology, their own tech stacks, their own business models, whatever the use case may be.

9. A UNIVERSAL PROTOCOL

Brad [00:24:59] But going back to you, one thing I did want to ask you: often when I talk to CEOs and founders, they also have in the back of their mind, perhaps we could also tinker ourselves as a team, not just build the protocol, but we could perhaps build some products. Have you ever thought about that on top of the work you're doing, which is vast? I mean, let's be real. This is a universal protocol.

But is it a possibility later on where you may privatise some aspects in-house, that can use the protocol like anyone else? That are high quality, that are high tech and are very usable for, say, for example, governments. For, say, for example, enterprises. So they don't have to build these products or these useful tools.

Ingo [00:25:42] Yeah, right now we are not doing this because we have enough to do with the protocol, actually. But like many blockchain companies you see, we also have two parts. We have the Foundation and we have the commercial entity. And the Foundation will always care for the protocol. But then we also have the commercial part. And the commercial part is absolutely free to move into building a service later. But right now, no time for that! But hey, next year things can happen.

But actually we don't have any...this company doesn't have an unfair advantage. It has the same source code as everybody else. And if we say we are going to build Service X, which is the super duper premium wallet for KILT credentials, someone else might come around and build a better one because it's just normal competition. We don't have any advantages. We could do that, but we are not even sure that we will. If we do, it must be a really bright idea. And we must also see that no one else is doing something better than that.

Brad [00:26:55] And you know what's so exciting is that the protocol itself is the ability, the basis, the foundation for all of the economy to emerge. That's what I'm hearing from you, is that the token economic design of this is really just to build out the value of the protocol, allow that to be the true core system at play when you can start to build these important credentials the world over.

So you must be pretty proud of the fact that you're potentially a world mover here. First mover, rather. Do you know of anyone else in the space, given that you've been doing this for a few years, that is doing something similar or doing something even remotely as complex as you in the world of verifiable credentials, in the world of Web 3, in the world of self sovereignty?

10. DECENTRALIZED IDENTITY FOUNDATION

Ingo [00:27:42] So that's a very good question, because we are part of the Decentralized Identity Foundation, which has, I think, more than a hundred, maybe two hundred companies in there. Small ones, blockchain ones like us, but also bigger ones like IBM and Microsoft. We are all organised there. Why did we do that? We saw that if it goes to digital identity, this is a biggie. Right? And we are not competing with our ideas of a decentralised identity with just another small company.

We're competing with the real big ones, the GAFA, right? And so if I come with my little 15-people team here and say now I'm going to compete against the GAFA, I will probably not be successful, especially not if the next project, just a couple of streets down the road, has the same idea and does it a little bit different.

And so what we need to do is we first have to agree on how we do it and then we have to do it the same way for the user. So the credentials and the DIDs have to look the same way. So already in 2017 we gathered all those companies together and said we have to agree on standards so that we are compatible with each other, even though we might be competitors. Where the DIDs actually emerge from, this is where the verifiable credentials standard emerged from. So there are many companies in this field and they all differentiate a little bit by doing something a little bit different than others. But the credential which you hold in your wallet will basically be compatible with any other. Right?

And this is absolutely important because otherwise we can't win. We are all, even if we are Microsoft and IBM, we are too small to win. So we have to put our strengths together and all go to a little bit of a different use case maybe, or go into a different vertical or have some speciality around it. Like maybe we are a little bit better in providing anonymity and we might be a little bit more in the blockchain world, which other companies maybe are not. But in the end the credential is the credential.

Brad [00:30:14] This is fascinating because I've spoken to only one other company in this context before where we were talking about standardisations. And we were talking about global standardisations that were reaching across into the mainstream, into those major players in enterprise, as you mentioned, in Microsoft. So what does that mean for something like KILT? So I can really understand, and everyone listening, when you're collaborating at that level. When you're having that inter-discussion about the internet of credentials, essentially. Having that TCP/IP really, to use that analogy, for having that credentials layer. That's a big deal for every aspect of literally every application, and every person in the world really can benefit from this.

I'm wondering, why would Microsoft pay attention to little KILT, little KILT Protocol? What's in it for them? What's the reciprocal and mutual benefit? Because clearly, no disrespect to you, they have the money, the power, the capital, the centralised systems. But what they don't have is the years of experience that you've had and you've built. So are you ahead of the game and they are catching up and working with you for that reason or what's going on here Ingo?

Ingo [00:31:23] I think in the beginning of this Decentralized Identity Foundation it was, just, let's gather the people and start to work on standards. That was the idea. So it's more like really doing something together and being bigger. And even Microsoft isn't big enough. They need us. It's not only us. They need the 200 companies in there as well. And pretty quickly, actually, we took it away from the company-to-company talk because that doesn't really make sense, because then everybody has their own agenda.

What we did is we asked and we were successful in asking the World Wide Web Consortium, the W3C to handle the standardisation process for us. So everybody now comes to the table and has their ideas. And so Microsoft has the same say in this as we do. And we all go to the standardisation bodies, bring in our ideas and what comes out is the standardisation. And we say beforehand, no matter what comes out, we are going to agree on that. Right? That's the stuff that we did.

Brad [00:32:31] So it's almost like the UN, Ingo, for credential standardisation, for a revolutionary protocol that's going to change the game. Once the world comes together on this.

Ingo [00:32:46] It's not meeting every day like the UN, but it's actually...(laughs).

Brad [00:32:50] It's mind boggling because we talk about DeFi but we have to have those board members at the dev table. And you're one of them. So how does it feel to be one in two hundred approximately who are contributing to what is potentially - without trying to understate this - a game-changer for the entire world? I mean, as revolutionary as the internet was, this could be also something of that magnitude. Would you agree?

Ingo [00:33:14] I wouldn't say... I would say that what we do with credentials and digital identity is a base layer which is needed for the next generation of the internet, which we normally call the Web 3. Which also needs some more things. But one of them is identity. Definitely. So you have to be able to do digital identity in a way that is self-sovereign – that's absolutely necessary. No way around that.

So we are important, but we are only a building block within something much bigger - that is the Web 3 - with things like infrastructure, things like being able to produce blockchains for dedicated use cases, like Polkadot does. Where we need decentralised storage like Filecoin and IPFS does. I think all those things basically have to come together to actually change the world of the internet and bring us into a new and a little bit better scenario with the Web.

Brad [00:34:23] Well said. And you know what's great is that you're embedded, as you articulated. You're a feature embedded in that layer, that fundamental foundational layer that is going to potentially sweep the globe in that Web 3 scenario. So you're not something built on top. You're actually embedded and built in as a key component with the credential aspect and the verifiable credentials specifically.

So let's keep going, because there is so much to unpack. And it's really exciting to talk to you. Your background – I just want to touch on that briefly. So that people understand again, you didn't just move from an everyday job to build this. You had a lot of experience behind you. So do you just want to give yourself a bit of a plug.

11. INGO'S BACKGROUND

Ingo [00:35:06] Yeah, so, after studying I had my first startup in the 90s of the last century. That was something completely different. It was medical informatics. And then we sold this company in 2000, I think, and that was nice. But then I did the thing that the normal serial entrepreneur doesn't do. I didn't set up the next company. I went into industry. And I think that was a good learning experience for me, because when you are always an entrepreneur and you're always the boss, then you actually don't know, don't learn how the structures work and how complicated and complex structures work.

So it was very, very healthy for me to go into big industry for 12 years or so. And I worked mostly with huge publishing companies and media companies and made my industrial career there. And then after that I decided, now I've actually seen both things. I've seen the small companies, I've seen the tech, but I've also seen how you actually build business and what the mindset of those people is and what they actually require and how you can talk to those guys. And that's a knowledge that is really, really valuable.

And then I decided, when the blockchain thing was coming up, I decided, OK, this is actually the big chance in my life because I understand this technology. How cool. And I know how to build a business and I know the surroundings. I know the needs of the industry.

And I can still speak to the blockchain scene people and be respected by them because I studied the right thing. So why not build something there? And then, yeah, I left my everyday job as a CTO and said, OK, now let's give it a try and build something which is actually useful for the world.

12. KILT USE CASES

Brad [00:37:13] Well, let's start with that comment for the next point of discussion, that's useful. That is such a rare proof in this space. As you know, with blockchain and crypto coming together to be known as the crypto space, utility and use case, real proveability when it comes to being applied and useful is a rarity and a gem, even today. So are you confident that you really do have something that isn't just a narrative, isn't just another scenario with the token economy, but actually something that is genuinely going to be applied and useful for the everyday user who more importantly, does not even need to know about the blockchain.

Ingo [00:37:51] Yeah, we did a lot of research on that because actually, the idea behind the whole thing of KILT is do something useful and not do something to get rich quick or something. So it's really about use. And we thought a lot about that. And many of the decisions that we have made are actually driven by this "use" thing.

So we were seeing that digital identity is really, really interesting. And we were also seeing that everybody is talking about the digital passport and how useful that would be. Actually, it might be useful in some edge cases, but talking to politicians, actually, it's not going to happen in the next ten years. Because the politicians or the governments, they have a monopoly on identity right now and they don't want to give it up. And let's be also fair, it's working for most people. Those people where it doesn't work – when you don't have a passport, when you are a refugee – for those people, it doesn't work in a nice way.

My passport works nice, actually. So I don't need to replace the very, very simple plastic card with a piece of really complicated technology. That's really hard to explain to someone living in Australia and Germany. And this is maybe going to come – but not today, not tomorrow.

But then we saw that there's a huge need in industry actually to have verifiable credentials for services and for things inside the internet. Because the only digital identity mechanism that we have is the OAuth2, which is basically the thing that the GAFA use to centralise the data. And it seems to be quite OK – not understandable for me – but it seems to me seems to be quite OK for people to have their credentials stored with a big American company and not with themselves.

Brad [00:39:56] No allusion there. Wouldn't be F and B together, would it?

13. WHY POLKADOT?

Ingo [00:39:59] It would be nice if we change that, but obviously this is also not the biggest necessary use case. The biggest necessity use cases are actually for companies, because when I build a product and this product owns a credential, then the credential is part of the value of the product. Right? And then if this credential or the validity of this credential is not with me – it is with Facebook or whoever – this is not acceptable for me as a production company. They need that. So then they need this fully decentralised machine, actually, where there's no trust needed, where there is truth in there. Right? And there, blockchain is needed, by the way. This is somewhere you can do something useful with blockchain.

And then you come to the next phase where you go to potential industry partners and say, hey, we're building this thing and it's a fully decentralised blockchain and it has the truth in it and it holds your credentials and you hold your credential but it holds the validity. And then they say, OK, nice thing. But unfortunately, your blockchain produces unpredictable production costs. Because sometimes the gas is five euros and sometimes the gas is fifteen euros and sometimes it's twenty four. And actually we can't produce things like that because we don't know how expensive the product is going to be in production so what price point would we set?

And then you could say, OK, let's do a permissioned blockchain like Hyperledger, or whatever, and go into that and then you have a predictable price. But unfortunately then you don't have the truth in the system, right? So you have a dilemma there.

And this is basically why we moved to Polkadot in 2018 because Polkadot is solving this problem. I think it's the only technology out there which we have which solves this problem. Because when I have this – it's called a parachain lease – I actually can build a small blockchain and have predictable gas prices, so I can say making a credential in KILT will never cost more than €0.10 or something. And then they can build their production costs on that.

But I can also say I have the truth of a truly, fully permissionless blockchain in there because I can send my blocks to the Polkadot Relay Chain and have them verify it for me. And if they are good, then they have the truth in the system again. So I have the mathematical truth and I have the price stability which I need. And we are really trying to make things which are useful and we are reflecting with the people who will use them later. And when they say it doesn't work this way, then we use the technology or choose the technology that can actually fulfil the requirements of the potential users.

Brad [00:42:57] And can I just jump in there? Because, I mean, there's a lot said in there. So clearly, you're the sort of person who's paying attention to the optimal blockchain platform; the optimal blockchain, full stack of services and provisions, tools and all the way down to that fundamental code. Now, you talked about Polkadot. Again, everyone knows I'm a fan of that, but I am certainly agnostically positioned in all the space. So I'd imagine you would be too, whether it be Polkadot or whether it be something in the future. The absolute criterion for you is that this system, whichever it is, is the best in the world in what you need. And right now Polkadot clearly is that for you.

Ingo [00:43:37] Yeah, that's true. We were brought there by this dilemma of price and truth, so they were solving the price/truth dilemma. So that was clearly where we wanted to be. So this is why we started developing the whole thing on Parity Substrate in October 2018. Parity Substrate was in the beginning at that time, so it improved a lot.

Brad [00:44:04] That's why we had the canary network.

Ingo [00:44:08] And then it turned out that it's also a nice community actually. And this is another reason to stay because the Polkadot community obviously attracts very, very bright minds. And that is also a thing where we feel very well. Yeah, we feel very well talking to and exchanging with people in a relatively small community when you compare it to Ethereum or so. And a relatively small community which has bright people in there who come up with new ideas, who also criticise you in a positive way.

Brad [00:44:45] Well, let's talk about that then Ingo, because we had the co-founder of Ethereum move across and build Parity, Gavin Wood. Then he tinkered with the highest standards of tech to build out what has now become the Polkadot ecosystem. We see that Substrate now emerged.

We see Kusama with the canary network, and we see again, from many other key parachain initiatives or potentials, we see also very complex and emerging tech moving out for specific purposes, specific use cases and even more that is just really on the edge of the future of decentralised technologies.

So this is a very big deal, knowing that we're talking about interoperability here. Cross collaboration, the potentials of working and enhancing even the likes of Ethereum, for example, and many others to come. So would it be fair in saying that you're also not only pro Polkadot, but you're pro interchain. You're pro bringing things together just like you are with the credentials built into this foundational layer of the future?

Brad [00:45:44] Surely, because when we listen to Gavin, he doesn't talk solely about Polkadot, he talks about what's coming and integrating so much more into a more seamless Web 3 world.

14. XCMP and POLKADOT RELAY CHAIN

Ingo [00:45:56] Yes, sure. So when you do base layer technology, interconnecting is crucial because people have to somehow use the KILT Protocol. And there are different ways to do that. So for industry players we provide a nice JavaScript SDK on top of that so that they can use their own resources, basically. Because normally big companies have some JavaScript developers. To build KILT applications on top of that, that's the industry part. We have to cover that.

We are very happy about XCMP now coming up, the cross-chain messaging protocol, so that we are able to natively speak through the Relay Chain in a very secured way to other projects which are also in the Polkadot ecosystem. And I'm very excited about what's going to come up there. This technology is brand new, right. So there's no one really out there already using it. It's just there. We now know how it works and we start talking with the first projects and say OK, and could we send messages here and there, and start collaborating on this level as well? So this is too new to talk about, basically, but this is very, very exciting for us. And I think it's a great chance to be an early part of this ecosystem, because in the beginning, it's going to be relatively small. Right? This is going to grow. Yes.

And it's good to be there in the beginning already and have some use cases also inside the ecosystem where we can show that communication through the Relay Chain is very valuable for projects to be part of this ecosystem. This will draw more people inside the ecosystem, which is good for us, because then we have more partners to talk to. And it's also good for them because if they wait a little longer, they will already find a functioning infrastructure for a lot of problems that they will see.

Brad [00:47:52] Yes, exactly.

Ingo [00:47:54] And so it's good for us to be in early and it's good for the others that we are in early because we can solve some of their problems. They don't have to wrap their heads around them.

Brad [00:48:04] Yes. Well, I want to dig a bit more because everything you're saying suggests meaningful partnerships, which was on my agenda later in the conversation. But let's do it now. So earlier in the conversation, you mentioned that blockchain itself is something you are knowledgeable about, or you had some understanding of. That makes you rare. Firstly, when you couple that with all the expertise you had technologically and even in your role as leading out some very important, I guess, engineering roles, important leadership roles, all the things you've done in the past.

Now, when it comes to crypto, we see a lot of partnerships that aren't meaningful, that are just hype-driven and fomo-driven and drivel-driven. But then we see the ones that aren't. You know the difference pretty quickly when you start researching why these partnerships happened.

What's interesting about you is that you could potentially partner with literally every high quality initiative that is useful in and of itself and in inter-blockchain, inter-multchain scenarios with other core layer one solutions or layer one foundational technologies. And then even outside of the scope of all of those in the mainstream, too, with the compatibility you mentioned, with the alliances you're forging. So let's start with the smaller ones. With the Polkadot arena, with the Polkadot potential. Can you tell us a bit more about the meaningfulness or the importance of these relationships you are forging and partnerships. For them, what's the mutual benefit and why are they saying, yes, partner with us? Because it is happening. It's unfolding now.

15. ECOSYSTEM COLLABORATION

Ingo [00:49:34] Yeah, that's actually pretty simple. This credential thing and identity thing, I would call it, this is a lot of work. And it's really not nice if you have a project which needs to identify a person, say you're building up an exchange, or whatever. If you have a DeFi system where you need some kind of credibility for people in there to calculate their credit score or whatever. You are very often confronted with the problem that you have to identify a person. And then you could go and implement this yourself because there's a standard or they'll just use the standard implemented.

Then you will notice, OK, the standard is maybe not enough. We need some things on top of the standard, like delegated trust and stuff like that, which you come to when you think about it and which are not described in the standard but are implemented already. Then you have two choices. Either you delay your project by one and a half years and start implementing the stuff, or you just use the stuff that is already there.

Brad [00:50:46] Or you call KILT. That's what you do.

Ingo [00:50:50] That's it, we save the people one and a half years of development work.

Brad [00:50:56] So let's be real, I mean, we've seen the value of some of these real and meaningful partnerships. Chainlink has led the way with the Oracle endeavour, and I'm sure you've seen that because they are essentially an agnostic technology that's important for the whole space. And they're working across a multitude of different layer ones. And even layer zeros, as we know Polkadot is.

So without, again, trying to add any kind of hype, it's really impossible not to when we know that this is a technology that doesn't really exist outside of the scope of you in the Polkadot context, I would imagine. Or if it does, there's few of them. And that means that there's a very high chance that there's going to be a vast amount of partnerships because they would all want to add this credential layer in.

Ingo [00:51:39] Exactly. I think there are two types of partnerships. There is the type of partnership where people just use our system. You don't have to ask us for that. It's open source. So that's the easiest partnership, when we've just noticed "Whoops, they are using KILT. That's cool." That's cool for us. But then there are also dedicated partnerships. And we use those partnerships for building things together.

So this happens, for example, as I said in the beginning with the Polkadex example, that we set something up together because nobody has done that before and we decided that we have to do that together. Right? Or with Moonbeam, we also have a partnership. We're building something. And this thing only works when we bring the devs together, actually. If we can't do it alone, they can't do it alone, let's let's work together. This is a partnership which really makes sense because it makes the thing bigger.

And then we do partnerships and actually also bring development resources to the table. In the normal case, say, the 95% case, it's just a project which is building something and says, OK, if we use KILT, then we're faster on the market and it also fits into the ecosystem. And let's just use those guys. Maybe they call us and say hey, we use you. And of course, they can.

Brad [00:52:57] This is so fantastic. It's fantastic to know this is already happening now. You haven't even launched and really explored publicly what's unfolding with your whole economy.

But to hear that utility is built in now, this is a big deal. Because sometimes we see white papers at launch with other projects, as you would appreciate, or not. So we like to see years of tech built in, years of the team building. And you've been doing all of that.

But on top of that, now you're starting to be able to be useful, prelaunch, with something that's going to fuel a broader, more experimental economy on top. So this is a big thing, especially knowing that this is related to something that's underpinning so much more above, like we see with layers twos and all the applications that can come forth on these new and emerging blockchains.

Brad [00:53:43] So one of the things you said is "simple". And often the case is with a great CEO, they won't explain that simple means very technical. But it does. You know, for you to get to something where it's seamless and easy and simple for me, it means that it's years in the making for you. And some of those key things that have come up are things like creating, issuing, verifying, presenting and also claiming when it comes to the digital credentials.

So do you feel like where you are in your roadmap now, that you can actually achieve those things in reality? When you see these partnerships, when you see these other businesses and entities and protocols start to want and need you as they emerge for the future, are you applied now? Are you usable? Are you ready to go? And is this moving forward something that's only going to grow and prove itself with real functionality and real application?

Blockchain Brad Interviews Ingo Rube: Essential Credentials for Web 3.0

KILT Protocol: Essential Credentials for Web 3.0 | Trust Enabler | Universal Blockchain Protocol
February 2021

Part 2:

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1. TESTNET TO PARACHAIN

Ingo [00:54:38] Right now we are in testnet mode. We want to go live as soon as possible. So actually from the tech side, including everything that we are claiming and what not, on the verifiable credential and DID side, we are ready to go. The testnet is out there for a year now and has been tested by lots of people. And we have got a lot of feedback and we improved a lot of things that we didn't see in the beginning. And so I think from that side, we are ready to go.

The only thing that is currently missing is the parachain. We're waiting for that. But that's going to come out - maybe not in the next weeks, but in the next few months, definitely. So we will have that and we will take part in the first parachain auctions and hopefully get one of them. And then we are basically... the next thing coming up is the go-live of the network. So we are ready to go. Just some external dependencies which we have to clear up and then we're good to go.

Brad [00:55:42] You absolutely must be excited because it's been years in the making. Now one of the things I wanted to ask you, and I hope you don't mind if I do, is the backers. Now often when we've seen in the last few years, there's been a lot of money raised in all kinds of ways. Some are controversial, some are not. But ultimately, it's the backers in the long term that I care about, and I hope others do, in the space. Because that's how they support you long term. One of the worries I have is that some of them don't and they're just out for the capital and they dump the value of your whole economy, your whole system.

But from what I'm understanding about you is that you've also built so much in that paramount to everything, even the fear of that, is the utility itself of the system. So what are your thoughts on this?

When it comes to backers, when it comes to the long term position for your economy, for the quality of the technology, for the team and for really pushing this whole thing forward. So that people can start to use this more and more around the world.

Ingo [00:56:42] Yeah, so, for backers, I think the fact that we are in this ecosystem from day one on basically, gives us a lot of connections to really nice people who back us. And they all come from the development circles. And I think it's even more important to have those people behind you than to have a huge financial backer behind you. It's always nice to have money in the bank. I think we do have some money in the bank which will actually give us the possibility to...

Brad [00:57:20] ...have more runway as well. But the great thing is that you have the devs. You have real people building this, as backers.

Ingo [00:57:27] Yeah, especially in blockchain, things take longer than we thought. We have seen that with multiple things. Just look at Ethereum, how long we are waiting for Ethereum 2.0.

Brad [00:57:40] Yeah, and respectfully so I mention that. Because we do see a lot of promises come out. But I mean, they were first mover in terms of smart contracts, as you'd appreciate. But again, that's why you're moving.

2. LOOKING TO THE FUTURE

Ingo [00:57:51] Also see that that's things like when we do the social KYC and those KYC things, those will first emerge inside the blockchain world, right? And the blockchain world is relatively small. And then we have those projects, which we call the lighthouse projects, together with European governments; and stuff like that. But those projects, they also take a very long time.

So we are in front of a runway. We have to recognise that. It's not like "Hey, we go live next Tuesday, then we have two hundred million users" – this is not going to happen. It's going to be gradual, a ramp-up period. And we know that we need the funds to survive that. And we're pretty OK with the funds that we have. So we are looking to a positive future.

Brad [00:58:41] And that's the great thing. That's the great thing, because that's what is beautiful about the crypto community, is that they do come together from top to bottom, from high net worth to the average person who wants to contribute. And that is where the movement is also potentially revolutionary because there are so many people that want to support endeavours like yours, quite sincerely.

So there's a lot of excitement for KILT out there, especially with the support and the brand and the integrity of the top tier Polkadot teams. That's the truth. And you're up there. We can see that code. We can see the collaborations that are emerging, the integrations. So there's a really good positioning that you are in right now for 2021. I'm really excited to see what's coming very soon. You mentioned the switch to live state from the testnet. That's also ahead on the road map. So that's all a big deal for everything from speculation hype all the way across to the imperative of having more credentials built in and more tinkering on the blockchain.

But what about things like market economies? We talked about trust built in, rather. So those trust market economies, they're really important to everything that makes sense when you build this out and when it unfolds. So that it all is seamless and, I guess, it's being self regulated and automating because the protocol's done. Are you excited about the potential of this once everything goes live, Ingo?

3. ENTREPRENEURIAL DEVELOPERS

Ingo [01:00:04] Yeah, definitely. I know this from my past. That was not only an industry, I was a board member of the Drupal Association. Drupal is one of the biggest open source projects out there in the world for a couple of years. And it's really interesting how open source actually works. Because, well, it doesn't go just by enthusiasm. It always needs money.

And the thing is, a project can only be successful if it is possible for others to earn money with the project. Of course, you can join and then hope that this coin gets rockets, but there must be a little more to that, actually. So with Drupal, what we learned is that we have to maintain just the core of Drupal. But then if somebody wants to build a website, they probably don't turn to us. They turn to the Drupal shop on the next corner. And the Drupal shop on the next corner then makes a profit with that website and then draws out a little bit, but then also contributes back to the original software.

And this is how the whole thing grows. In Drupal we had more than 70,000 developers working for Drupal and we didn't pay any of them, but they all got money. Because they all had jobs because it was possible to build business on top of Drupal. That's the important thing.

And this is why we focus very much in KILT on the fact that it is possible to earn money with KILT. So if you are a trusted entity or building trust and want to build a trusted entity on top of KILT – like, half a year after we go live there will be another stage for that, so that you can build virtual organisations on top of KILT which accumulate trust – so if you are in a business like that or if you want to go into a business like that, then you can build that on top of KILT. But you can also be an integrator and just build software on top of KILT and start earning money with that.

I think building this economy is absolutely crucial for a lively ecosystem and this is why we have a strong focus on that. That every role, no matter if you are a validator, if you are a nominator, if you are a builder, if you are an entrepreneurial developer, if you are an attester, if you are an integrator, that all of those guys, according to their abilities, have the chance to grow on this. And there must be the possibility to live off it, right? You cannot trade on something you can't live off in the long run. Sometimes you have to eat, right! And then you need some money to buy your food.

4. BERLIN AS BLOCKCHAIN HUB

Brad [01:02:48] It's amazing. And this is a decentralised global economy built in and embedded into this protocol. And that's where the game-changer is. Not only is it the benefit of the block chain for the transparency and for the provability, but really it's also a major game-changer because there's something real built in that's a unique technological addition to the layer one and layer zero tech stacks.

But you're literally providing something that is an incentive by design to take on board and use and and reap the benefits of. I mean, that reward system that is being built in is really second to none. And it's really what is, I guess, catching attention all the way to Wall Street, because it is a different classification. And this is what I did want to talk to you about.

Berlin and Germany are world leaders when it comes to being progressive in the blockchain. We know all the way to dena, we know to the government papers I've read. It is quite remarkable. And they definitely are supportive of this kind of innovation to really bolster, much like you see hubs of the world for tech. Berlin is no different, I guess, to Silicon Valley, some places in Hong Kong or in China, Shanghai, India. So you must be excited that you are in one of the world's leading hubs to build out and play around with something that by design can really change the game when it's married with something useful like these credentials that you are building into the layer ones.

Ingo [01:04:22] Berlin is fantastic. I can say that, I'm a born Berliner. Yes. It is, it's fantastic. But it's also really nice - when we saw the blockchain scene emerging here from 2015, 2016, 2017 on, where the Ethereum builders were here, where also other new companies like Ocean came up here. And it was very, very intelligent people and a very international crowd. It was really, really nice. We had blockchain meetups every night. You could get your pizza and beer there and listen to really highly intelligent people.

We've got the whole Parity team – or, not the whole Parity team, but most of the Parity team - sitting in Berlin. Which was very helpful for us, of course, because we could not only video conference with them, but also meet them in person. That's just two kilometres away. That's also nice because it builds personal relationships, and even in computer science, personal relationships are really important.

Brad [01:05:32] I want to ask you also, I follow a lot of the things that Gavin's involved with, and he is obviously a staunch advocate for the tech first. You don't see him in a lot of interviews, but you just know this guy is all about the integrity of the technology first and foremost. I would imagine the relationship you'd have with people like Gav would be pretty important because he sees the value of what you're doing. You're in Berlin. He's been building Parity from the outset. So, do you liaise, do you engage, do you connect with who is essentially the co-founder of Ethereum and the builder of Polkadot?

Ingo [01:06:07] Well, basically, we know each other, but it's not necessarily that we engage every day and make plans together. I think it's far more important, actually, that the devs of the teams work together. That's bigger because this is where the news comes from. Right? And when Parity changes something in Substrate or so, it's so important for us to get very early information on that, to have somebody to talk to and say, "whoops, now my code is broken at this point. Did you change anything?"

Those things, I think, are much more important than the strategic alignment because the strategy of Polkadot is one thing. And it's good that we know what's happening there. But we don't have to align all the time. The whole thing was built as an ecosystem. So we are basically doing what we think is important and what is right. And we do our stuff and we are just linking up to their system and utilising what they have built. So it's not necessary that Gavin and I make strategic decisions.

Brad [01:07:11] Right, and that's the way it should be. I have noticed that Gavin does support you with his own tweets of you. Obviously, you know, the fact that you're on that testnet indicates a lot with regard to that mutual support indirectly.

5. DEMO CLIENT AND KILT FAUCET

Brad [01:07:25] So it's great to know and again, I agree with you, I think the tech needs to speak. It's not about the fomo and the hype of certain personalities in the space leading things, and that's certainly not Gavin's agenda. It's more about letting the tech talk and you utilising it how you see fit.

And that's definitely what you've noticed from the technology, from what you've been saying and what you're doing now, which is essentially building upon what is already available. And then letting others use you for their own purposes.

So with regard to things like the full SDK. I want to understand, is it all ready now for access? Can anyone go and use that in this testnet phase? And also, any other things that you've built in beyond the SDK? How much is actually ready and being used now?

Ingo [01:08:11] Yeah, so the SDK is, I would say 100% ready. There's going to be a new release, but this is minor changes in...next week I think. That should be the final release for the SDK actually before going live. So everything's there, everything's open source. Go to dev.kilt.io and find the Github pages there. Find the 101s and how to install it, how to use it. And if you get stuck, just jump on our Riot channels and get the devs directly and ask them why you're not going forward.

Brad [01:08:45] So the devs are relatively accessible for other devs if they need to connect.

Ingo [01:08:52] I think this is happening all around the ecosystem. So basically there are lots of Riot channels from all the projects. We never had any problem getting in touch with anyone. And we try to live up to the same standards, also be as accessible as possible. When five hundred projects ask at the same time, then it is a sign for us that we obviously need better documentation. Right now they still can develop.

Brad [01:09:25] Absolutely, and that's great to know because having that access to you is going to mean so much as people are trying to just grapple with the gravity of what they're embarking on; if they're new, perhaps, to blockchain or new to some of the technology that you're building out. And certainly the SDK is a great tool for them to engage. With regard to things like client demos as well. That's available, as I understand. So how is that working in the context of the SDK? Are there other things and demos that you provide for parties as they are starting to really want to utilise the protocol itself?

Ingo [01:10:02] Yes, what we have is a demo client that everyone can access at demo.kilt.io. We have a faucet where you get some Mashnet coins, which is our testnet coin, and then you can play around with that and that's basically built for if you have a great business case in mind.

And this involves credentials and well, maybe something like delegated trust. And so as one entity delegates trust to another entity and this entity then issues a credential and somebody then looks at it, and whatever. So with the demo client, you can basically build those scenarios very easily on the live testnet. It's not a fake. So when you start it's connecting directly to the blockchain and you can start building your business cases on that.

And then if you see that the business basically works with that technology, if you want to build your application, then, as the demo client is, of course, open source as well, you can just take this piece of software and hack it into pieces and reuse pieces of that to more easily build your application, because it's a nice piece of software. So that as a developer, you can understand what's happening there and you can just use the pieces and build up your system easier with that right on top of the SDK.

6. PROOF OF STAKE

Brad [01:11:26] And it's good that you have all of this ready now. I mean, you really are coming out of the blocks, literally, so to speak, with so much ready for 2021. And we like to see that when it comes to those who are exploring these new technologies, coupled with economies. And in that sense, I wanted to also ask you about your comment more generally about staking.

Because that seems to be a really innovative way to add democracy, to add support for legitimacy in what you're building, but also just sheer value in enabling an economy. So do you think that staking more generally is something that is not only innovative but necessary to build out the initial support and attention and interest in something like KILT?

Ingo [01:12:15] I think staking is really, really important because we decided a couple of years ago to move away from proof of work. First, proof of work is not really sustainable.

Brad [01:12:26] A bit too much work!

Ingo [01:12:29] Yeah, that's a catastrophe for the environment. And if we have better technologies at hand, like proof of stake, then we have to use that. We cannot go back and say "proof of work is also nice. Please have big KILT coins farms out there." You don't want that. I think that's the first notion that we need to do. And then there's a necessity inside any permissionless blockchain system that is decentralised to be de-incentivised to do wrong things. And this is what you do normally with the proof of stake system. And this is why you need staking.

And then after that was found out five years ago, then people started thinking about, hey, actually there are interesting economic models behind that, which can also not only de-incentivise people, but which can also incentivise people to do things, right? And there are different ways you can go there, like nominated proof of stake and stuff like that.

And I think the direction in which the Polkadot and Substrate things moved is actually extremely well thought out. Because it has a lot of democratic ideas behind that, which are extremely cool. And it's not perfect. Nothing is perfect. And that is not a true democracy, of course, again. But it is far closer to a democracy than maybe all the other things we see out there. So we are absolutely happy to adopt these technologies and those mechanisms also for our system.

Because they are economically very sane, I would say, and they are producing the current maximum of democracy within the network, which is not the optimum probably that we will ever see - so there will be new developments after that - but I think it is the best we have right now. So, yeah, that's it. And it's there. So it's there to use and be built. And this is another thing, right? Like other people are using KILT because they don't want to implement this boring credential stuff; we can use Parity Substrate, Polkadot, Kusama mechanisms to actually not reinvent the wheel on this nominated proof of stake thing. So we're basically tweaking it. But we are 98%, I would say, using the mechanism that Polkadot and Kusama already proved work, obviously.

Brad [01:15:17] Yes. And I think people underestimate Kusama thinking it's just simply a testnet. And we know it's so much more than that for specific use cases. For certain parties who want to have, perhaps, a less expensive - in terms of cost and tinkering - system as opposed to that really gold star or gold standard parachain with the Polkadot network itself.

Making sure that differentiating use cases for both is important, not just simply saying that one is the step to the other. It's just not the case. You would know that, because you certainly are involved in both of those core technologies.

Now, the roadmap, I wanted to ask you again, it's not definitive, but I have read a bit into some of the interconnections, and I thought you could clarify or confirm. It does seem to me that certain entities in Berlin, beyond even the blockchain space, are paying attention to you and can see the benefits of this. And I mentioned this in the context of some of those local government bodies. I listened to some of those - the ones that aren't just in German - I listened to some of the presentations that happened there. And it's really interesting because there's so much interest from the top down coming from Berlin and coming from Germany. Do you foresee in the near future, more of these kinds of announcements that come out that showcase that KILT is going to be embedded in the real world so that the average person can read in the paper that this company has partnered here and is doing this.

7. KILT IN THE REAL WORLD

Brad [01:16:46] Will we see more exposure of KILT in the real world? So people understand it's not just a blockchain game for crypto-savvy people.

Ingo [01:16:54] Yeah, we're pretty sure that this is going to happen because we're being involved. We tried to pay attention to our surroundings in the beginning. And one of the surroundings, obviously, is the crypto scene, which is important for us because we're part of that. But there's other worlds out there. And there are some people in the crypto scene who say we don't have to recognise them because we are happy in our bubble.

But we said from the beginning, actually, we have to recognise the outside world and the outside world consists of people, industry and government. And we tried to make connections there as soon as possible. And the merits of that is probably that now governments are sometimes very much interested in building projects, not only in Germany, by the way. Right now, we are talking with a South American..

Brad [01:17:45] You can't tell me too much, can you?

Ingo [01:17:46] ...about a climate thing. That would be extremely exciting to also have a footprint there. And if you talk to those people, if you respect them - OK, you're from government, you might have a little bit different views on things - but we are not being bad. We're trying to build a supportive technology, which might be interesting for you as well. And if you consider thinking about using such a technology, maybe it's also beneficial for you. And then people start thinking about that.

And this is why a project like the German Energy Association is doing a project with us. This is why we are part of the Gaia X project, which I'm extremely proud of, which is the European cloud infrastructure. We are one of the first members there as a company. And the other companies in there are basically like the German Telecom with two hundred thousand employees or something. And then it's us. And it's good to be there.

It's beneficial for them because in this case, we definitely bring very, very new ideas. And it's beneficial for us because if a thing like a European cloud infrastructure should ever be really, really successful, it's already got KILT baked in then, that would be cool. So, yes, I think we will see a lot more of those things because we didn't do any big marketing things around what we do.

Brad [01:19:16] Yeah, I don't think you needed to. And you also are backed by some of the most reputable in this space when it comes to start-ups, when it comes to people. Or even if you are working relatively independently in that context, you are still using the underlying core technology. And we saw the likes of Energy Web, for example, and you mentioned some names that they're also aligned with. And that's because you see such immense support from that mainstream arena of business enterprise.

And what was great about the parties that you're involved with is, you're not discounting the value of enterprise either. It's not just simply the narrative of DeFi, a.k.a. cypherpunk or right at the end of one continuum. You actually appreciate the whole broad spectrum from one to the other and everything in between. So with the roadmap, because it's been a long interview and I do apologise for the length, there's so much I want to get out of it. What excites you most coming up? Because you are the CEO, you certainly are privy to stuff you're not telling us today and respectfully so. But what are some of the things that you're excited that you can tell us about the KILT roadmap that's coming, that you feel very confident is going to unfold in the way intended because you're on time so far?

8. A ROCKET WITH TRAINING WHEELS

Ingo [01:20:25] Yes. The most important thing for anyone who builds a blockchain is basically a token generation event. And then the phase after that until we set the thing to complete decentralisation. So this is going to be an extremely exciting time for us. We don't have an exact timeline because we still don't know when we get the parachain, because we don't know when the parachain auctions are.

Brad [01:20:48] But not months away.

Ingo [01:20:52] We expect this for the very, very near future. And this is the most important time for us because the blockchains are a little bit like a rocket, right? You fire them off once and then they lift for themselves. And if you did something wrong, then it's a really big mistake. Or you have this, like Polkadot did, this transitioning phase from after the token generation event to the decentralisation, where we have maybe six weeks to a month where we have the Sudo key and can still fiddle around with the system.

So we have a rocket with training wheels, which is good. And this period of having a rocket with training wheels is probably one of the most exciting periods of my life.

Brad [01:21:42] Absolutely. And, you know, what Ingo, I have to say, perfect timing. And this was fortuitous by circumstance, because now we see the market in the way it is. We see the conditions are ripe. We also see most importantly, that there is so much support in the crypto community for Polkadot and for multichains and for integration, for collaboration, for Ethereum, for DeFi, for Web 3. Now you're coming out with the reputation of all of that, plus the credibility of all the time you spent building this. And we can see it. It's transparent through the code and you have the use case.

So there's so much going on. I'm very excited for you, for this new event that's about to unfold. But beyond that - you're going to be subjected to a lot of hype - is what excites you post that, when you really start to see, as a lead developer, as a lead, a sort of initiator in this movement, beyond the live moment, what's something that is going to really showcase your value to those who want to start to tinker more? Is there anything at all that you know about that you can tell us post a major event coming up.

Ingo [01:22:48] We could talk about this project or that project, but...

Brad [01:22:51] ...you'd have nothing to talk about later.

Ingo [01:22:55] ..but they would be really, really disappointed because they didn't get mentioned. But I think that everything that's growing adoption, and maybe growing adoption in the big wave, is going to be very exciting for us. After that it's basically growing adoption. That's what we are going to do in the next two to three years after that, grow adoption for the whole thing.

9. KILT COMPETITION

Brad [01:23:22] So just a couple more things I want to ask you. One was the competition question. Now we've seen the likes of Litentry emerge. Litentry is something that arguably has its own unique value proposition. It also has come forth prior to you. I wanted to ask you some specifics about that with regard to the claims potentially of all the differentiations of both in the context of identity. Because one, on the one hand, there's arguments for KILT, there have been suggestions of off-chain authorisation to issue credentials as opposed to potentially on-chain. Another argument is put forth for Litentry. So I wanted to ask you, can you clarify exactly if there is even competition or are they different? And are there any others aside from Litentry that you have your eye on?

Ingo [01:24:08] Well, it's always complicated to talk about other projects because I don't know exactly what they're doing today. So that can also change. What I have in my mind is that Litentry is more about producing reputation on-chain and utilising other chains for producing this reputation. So you have a reputation on this network, have a reputation on this network, and they are aggregating the reputation.

So this is actually an interesting use case that could be used also with KILT, because when you talk about reputation, you normally don't talk about your reputation. Normally when you are in the credential space, you're talking about the reputation of the attester. So when you show me your university degree, it's not about your reputation. It's about the reputation of the university. Because I look at the credential and say, oh the university is great, so this guy must be great. So it's about this reputation.

Ingo [01:25:19] And I think that an area of cooperation could actually be that we could use the Litentry system to build the reputation of attesters in there. And then those attesters issue the normal credentials to the people. But this is something...we are talking for a couple of months with Litentry.

Brad [01:25:42] This is super interesting because you have all attestation information in your white paper. It goes into detail about that aspect as well.

Ingo [01:25:49] Exactly. And then they are concentrating on something else. They're concentrating on the reputation part. We are not really concentrating right now on the reputation part. So if they do a good thing there and if they actually manage to utilise the Polkadot ecosystem for receiving some kind of reputation from other chains, that could be valuable to aggregate with them and then use this power of reputation for building attesters. So actually, for me, it's not a case of competition. For me, it's a case of potential cooperation.

Brad [01:26:29] Exactly. And that's what I was hoping because when I was researching. I couldn't really see how the idea of competition come up. It was just someone brought me the question actually, in the community and I wanted to clarify that with you. So it's exciting to hear that they have a unique value proposition.

10. BUILDING ADOPTION

Brad [01:26:45] Yours sounds like it's very vast, though, in the sense that once again, you are specifically about that verifiable credential embedded in all potential startups and all potential uses of the technology right across the board. So it's going to be interesting to see how this unfolds. And again, I wouldn't be surprised if there is a partnership that does emerge that's meaningful between the two of you.

One last thing I want to ask you. I think I can already guess the answer, but are you going to engage in marketing or what's the strategy here? Because I will say this. You don't come across like someone who is playing games with a lot of the, sort of, more questionable things we say with influencers in some respects from certain sort of lower-tiered start-ups where they almost rely on immediate hype. Sounds like you're going to approach this very differently.

Ingo [01:27:34] Well, yeah, so what will we do with marketing? So we will have to do more marketing based on the technology, because when the technology is out there and it has the first use cases, then I think it's really, really interesting to have those lighthouse projects out there and then also talk more. So this is computer science and computer scientists don't talk. So this is why we were a little bit silent maybe in the last three years.

We have to change that a bit and talk more about the technology. I don't think it's the right way to do this. Well, I'm always happy when one influencer says KILT, because that feels to me like we are recognised, so that's really cool for us, but this is probably not how we will actually get the word out to industries and governments and bodies like that. So I think, influencers are important and it's good that they like us and I hope they like us.

But it's also important that we are a part of, for example, the International Blockchain Association, that we are part of the Blockchain For Europe initiative and things like that. I think there's a lot going on on the interface between the blockchain world and the old world, right? And so we engage a lot in those things as well.

So that's really important because what our goal is actually, as I said, for the next three years, we have to build adoption. This is where everything comes together. It's nice to have good technology out there, but if nobody knows about the technology, it's useless, right? Now if you can build for three years the best possible rocket...

Brad [01:29:41] Exactly. And what a time to come out. Now you'll ready to go, you're ready to fire the engines and showcase that you are able to achieve adoption because you spent the years. And it is time for you to come out of the blocks as well and go with your team. And I had a look at them. If anyone wants to know more about the team, there is so much information. There are so many credentials, again, no pun intended, but there are a lot in the team itself of KILT Protocol.

Now. As I said before, there's a lot that's going to unfold here. It's very clear you're in a position that's primed for the attention of all the crypto space right now. They're hungry for more in this market. And they're certainly looking for the best reputation, the best credentials, the best technology that can really prove itself as you move forward and you're primed to go. So with that in mind, thank you so much for your time. For those who survived this very long interview, it's been an honour speaking with the founder and CEO of KILT Protocol.

Again, if you'd like to know more, I put links in the social media. I'll make sure that there are links for those who are devs who want to learn more and can interact with devs based on the feedback from Ingo after the interview. And also, just don't forget, credentials is the word, but it's all about embedding into the technology. It's about making sure that it is provided for a very specific trust aspect of the trustless world that we are currently all trying to support for the future.

Ingo, is there anything you'd like to say as one final comment to the people on behalf of KILT Protocol?

Ingo [01:31:14] I don't have anything else. I'd like to thank you for the excellent questions. That was really, really good and a very nice interview. Thank you very much for all the questions and for digging so deep into what we do, which would obviously enable you to ask those very specific questions. Very cool. Thank you.

Brad [01:31:34] You're super welcome. And if it's okay with you I'd love to catch up with you again, especially after these events are about to unfold, because it is always about that continued support, free, transparent. Everything you represent is the same for me. I definitely want to see you grow in the future to really transform legacy models that need to change. And you are definitely part of that conversation. So keep going Ingo, keep leading this team out and don't stop, mate. It's only going to get more exciting, as we see the blockchain show what it can do.

Ingo [01:32:04] Thank you.