EPISODE 1327

[00:00:01] ANNOUNCER: Google uses automated programs called spiders or crawlers to index webpages. Then when a user searches for something, it uses a ranking algorithm to determine the order of results to display. This process, of course, applies to webpages on the Internet. There are two major projects worked on by the company Edge & Node that do what Google does for the web, but for blockchain. The first is called the Graph, which is an indexing protocol for organizing blockchain data and making it easily accessible. The second is Everest, a universally shared project registry of unchained data. In this episode, we talk to Nader Dabit, Developer Relations Engineer at Edge & Node.

[00:00:45] CW: Nader, welcome back.

[00:00:46] ND: Thanks for having me.

[00:00:47] JM: It's such a privilege to talk to you both because we're friends. We both produce a lot of media. But particularly to this conversation you have, since our last conversation, shifted from working at AWS to working in the crypto space. How's that going?

[00:01:05] ND: It's going amazing. Having the top of my life, we're doing cool stuff, interesting work. Community and culture is cool. I'm enjoying it. The team that I work with is amazing.

[00:01:17] JM: Edge & Node. So you are working on the Graph, which is a decentralized infrastructure interface maybe? How would you describe it?

[00:01:27] ND: Yes, the graph is an indexing protocol for distributed decentralized data, typically blockchain data for now. In the future, we aim to also be kind of a decentralized data source for any public data. But for now, it makes a lot of sense for us to kind of support a lot of the applications that are happening in the blockchain space. So you see NFT projects using the Graph. You see DeFi projects using the Graph. You see games using the Graph. Any front end application, or any application that needs a rich querying layer from a blockchain like Ethereum, for example, uses the Graph to kind of get that, because it is not possible to get that rich querying directly from the blockchain itself.

[00:02:08] JM: This is beautiful, because I recently started a company called Rectangle. I raised a little bit of money for it, which is building – Basically the idea is what do we need to build to get crypto and fiat to talk to each other? We have no code written at this point, by the way. But basically, it's a pragmatic company. How do we just like, for example, convert fiat to crypto, or reverse that. There's no good ways to do that. And what I like about what you're doing is it's very pragmatic. It's just we're building a protocol for accessing decentralized information. That's really all it is. Why does it seem like so much of the crypto world is kind of focused on non-problems or non-solutions? Or just things that don't feel like the correct approach? It almost feels like you have a lot of theologians trying to write software that doesn't actually end up doing anything.

[00:03:05] ND: Yeah. I mean, there's a bunch of layers to that question, I think. And I can kind of give you my perspective of someone that's only been in the space for about four months now. But that has really had a fast onboarding to a lot of the things happening. And I kind of have a perspective of someone that's been in the traditional web space. I've worked at AWS. I've been a mobile developer and a consultant, software developer for 10 years or so. So I guess to answer that question, first of all, there are a lot of tough problems to solve that have exponential payoff. For instance, the idea of a blockchain itself was such like it's really like just a computer science breakthrough that enabled all of these other things that we're now seeing happen. So like for the amount of return on investment, say, for instance a Bitcoin, which was the original blockchain that was actually proven, the return on that investment is almost in the trillions of dollars at this point.

So I think that when you see the type of exponential payoffs, when you're kind of building out a platform that can be accessible for every application in the world and also interoperable with a lot of applications that are also in this similar space, you kind of see like this high return on investment. So I think that a lot of the projects are trying to solve these really tough problems. And some of them that I talked to are kind of so far off to me, but also, like a lot of these people are so much smarter than me. I just kind of assume that a lot of them know what they're talking about. A lot of them may not. But for instance, if I kind of looked at the Ethereum whitepaper 10 years ago, or however many years ago it was created, eight years ago, six years ago, I would have been like, "What problem are you trying to solve? I don't get it," right?

I mean, I think some of the people here kind of like they've started where we are today and they're kind of looking like a couple of years down the road and they're trying to solve problems that I don't even see yet. But there's also a lot of money and investment in this space. So I think people are also – I mean, the negative thing about this industry is you do see projects where people are just looking to kind of like get rich quick, maybe. So there are projects out there where people are raising money. And it's impossible to know their intentions, right? Unless they have a track record of having been legitimate or something like that. So there's a lot of layers to that question. I think that you're seeing a lot of really difficult computer science problems that are trying to be solved that will end up having like these massive payoffs, but also, me being someone that isn't like a really, really advanced knowledge person as far as like some of these advanced problems that they're solving, it's hard for me to know like whether they are legitimately solving something or not.

[00:05:57] JM: Simple question. Where are my micro payments? It's 2021. Where's the micro payments? Why can't I pay somebody in Nigeria five cents?

[00:06:07] ND: Yeah, I mean, I think that what you're seeing with some of these other projects that are starting to get traction is that they are more scalable than Ethereum. And the thing with Ethereum, it was the first platform that allows you to kind of write smart contract code and have the ability for other people to launch applications on top of an existing blockchain. But the problem with Ethereum is that it doesn't scale in its current form. You can only have X amount of transactions. I don't know the number, but it's not nearly as many transactions as what you would probably need or would see in something like an AWS database or an AWS API that anyone can spin up.

Also, the cost per transaction is extremely expensive relative to a micro transaction. That's why you're seeing the current DeFi space and the current NFT space all blowing up because these transactions are hundreds of dollars, or thousands of dollars, or even millions of dollars. Relative to $1,000,00, $15 or $5 is nothing, right? But yeah, you're talking about micro payments. So like if I want to send someone 50 cents or $1 for a coffee or something like that, it makes zero sense to use Ethereum. So I think some of the projects out there that are kind of getting to the answer to your question would be a Solena, Celo. I think both of those projects

seem to be really interesting, because they are both focusing on either scalability or actual payments themselves. So Celo is kind of like focusing on payments.

I don't know enough about it to kind of speak deep about it technically, but I think they're trying to solve that problem. And then I think Solena is something like 50,000 transactions per second. And they're seeing a lot of increased adoption. So if people start adopting Celo wallets, you start seeing people using things like Phantom the way that they're using Metamask. Yeah, I think the answer to that question is actually almost here. I think that we just need the UX to be there, and we need some of the DX to improve so people can actually build the applications for people to use. I think the technology is almost here, if it's already here.

[00:08:17] JM: Is Bitcoin the base layer of a new financial system? Or is it a reference implementation?

[00:08:26] ND: I think it kind of depends on who you ask. And I can tell you my opinion. I think that it's, for sure, a reference implementation and kind of a proof of concept. It works, right? And it's something that we know works. So now people are confident to start building out more sophisticated, more scalable versions of it. And it's hard to know where Bitcoin is going to go, because you start seeing a lot of these other projects that are doing essentially the same thing, but they're doing it in a more scalable way. But Bitcoin was first to market. And a lot of people are highly invested in Bitcoin. You have massive, massive investment firms now getting into it. The people that you would see on Wall Street are now holding large stakes of Bitcoin. You're starting to see Bitcoin talked about in the House of Representatives and Senate, and even by the President of the United States and legislation around it. it's part of society. A lot of people look at it as a store of value.

I personally don't hold Bitcoin, not because I don't think it will continue to be a thing. But I think that I am interested in more of the environmentally friendly blockchains. And so that's kind of why I got into this space when I did, because I started seeing that the industry as a whole was actually moving away from proof of work. So Bitcoin still uses proof of work, and I don't think it's ever going to stop doing that. So for me, if I can invest money or if I can build a platform, it's probably going to be something that is more environmentally friendly. But yeah, I don't think Bitcoin is going anywhere anytime soon unless some major, I would say, incident happens

maybe In the financial system as a whole, and the entire financial system like has a huge bear market or something like that.

[00:10:06] JM: But you believe it is one of many cryptocurrencies that will exist.

[00:10:10] ND: Yes.

[00:10:11] JM: And what is Solana relative to Ethereum?

[00:10:15] ND: Solana to me is a more scalable version of Ethereum. I mean, if you wanted to kind of make it really, really boiled down, that's the way I would look at it. From a developer's perspective, you can write smart contracts, and you can execute smart contracts, you can launch tokens. You can do all this stuff that you can do on Ethereum. It just has faster and less expensive transactions. Now, I don't know enough about the consensus mechanism to speak to how decentralized it is relative to Ethereum. But as far as the actual, what you would use it for, I think that it's very similar to Ethereum. And you're starting to see like it gain actually a lot of adoption. So if you're listening to this and you kind of go look up the amount of growth that is happening as far as actual applications running, you're going to see that right under Ethereum you actually have Solana and Polygon. And Polygon is the layer two, or it's actually **[inaudible 00:11:10]** of Ethereum. So you could almost bucket Polygon and Ethereum together. And then the only other blockchain out there that's doing that type of volume is Solana as of this recording.

[00:11:20] JM: How did Solana build a scalable system?

[00:11:23] ND: Again, I don't know enough about Solana. I've really been focused in my three and a half, four months in this industry focused on the Ethereum ecosystem, just because it has the largest number of developers, it has the largest number of applications, it has the most content. To me, it's kind of like if you look at the Pareto principle, like what can you do to ramp up and get the most return on investment for time? For me, and for a lot of developers building on the graph today, they're using Ethereum. So that's kind of what I'm focused on. But if I was to say some of the things that I'm going to be focused on understanding better in the next year? Solana would be one of them. I'm interested in Near a little bit. Celo, Avalanche, those all seem

kind of interesting to me. They're all solving slightly different problems, but also similar problems. And I think that the future is not going to be just a single winner takes all solution. It's going to be basically a bucket or a basket of chains that kind of all coexist together. A few of them are going to outright have a large number of the growth. Like they're going to like encompass like a large percentile, and then you'll have a few that are kind of right below. And then who knows what's going to happen after that, right? Like you have all these other people building similar things. It's hard to know who's going to be the winner. But like if I had to kind of go ahead and say what my predictions would be in the next few years, those are the projects that to me as a developer. And I think that the perspective of the developer matters a lot more than maybe someone that's not a developer, because we are the catalysts for the applications that ultimately are built, which ultimately drive the traffic, which ultimately drove the transactions, and therefore possible like momentum and adoption.

[00:13:07] JM: Proposition. No blockchain today is truly decentralized. However, we are seeing useful developments in the crypto ecosystem. And the problems that are actually being solved today don't really have anything to do with decentralization or uncensorability. It's more about how do you build shared infrastructure with fine-grained permissions? Agree or disagree?

[00:13:38] ND: I would say it depends. Like I would say I agree with some of the ideas there, but maybe not all of them. Like what do you mean by what chains in particular, like what projects in particular do you feel are like less decentralized?

[00:13:53] JM: I mean, can't the US shut down any blockchain in the world that they want to today?

[00:13:59] ND: From the perspective of a legislation?

[00:14:03] JM: From the perspective of name your technique, legislation, CIA edict?

[00:14:10] ND: I mean, it would be hard to shut down the network outside of the United States. I mean, maybe you could put some type of firewall or something with the people that route Internet traffic or something like that? I don't know. But if people are running nodes in South

America that are talking to nodes in Mexico, I don't know how they would be able to shut that down.

[00:14:31] JM: I mean, can't you just Snowden everybody? Or Julian Assange everybody?

[00:14:36] ND: I mean, this is kind of out – Are you saying like launch a 51% attack?

[00:14:41] JM: No. I'm just saying like literally threaten anybody who tries to stand up a blockchain or force.

[00:14:48] ND: Oh, yeah, yeah, you can do that. But do you know how many people are running these nodes? There's literally like God knows how many, but uncountable. Like I could go into a warehouse and dig a hole and build a note and put some electricity on there, cover it up and it's going to be running. And that would be one node. How are they going to find that? To me, I don't think they would ever be able to shut down any of these networks that are truly "decentralized". And of course, like you mentioned, to me, it's more of like a spectrum of like decentralization. You have the most decentralized, which to me are things like Ethereum, and Bitcoin and any other chain that is not controlled by an X number of nodes that are controlled by companies. So for instance, Binance Smart Chain, I believe, has like 20 nodes that they control. And if they shut down those nodes, then the entire service, the entire chain would just go offline. But with Ethereum or Bitcoin, I could spin up a node somewhere in Russia. And as long as it exists, and it's online, and anyone can interact with it, and they would have to shut down every single computer in the entire world that's running that software.

[00:15:51] JM: Yeah, sure. But like the US government could go to Apple and say, "Hey, Apple, we've decided that we want the dollar to be the only currency in the world." You have to basically disable the iPhone for anybody that is using a blockchain, whether they live in Russia, or they live in the United States. And the US government could go to Apple, or you could go to Google and do the same thing for Android.

[00:16:15] ND: True. Yeah, they could do stuff like that. And it would essentially shut it down in the sense that no one would be using it and the price would crash. But then there would be nodes still running, right?

[00:16:26] JM: That doesn't have are useful.

[00:16:28] ND: Exactly. It wouldn't be it wouldn't be very useful. True.

[00:16:31] JM: And then for the for the people who are still running nodes, the US government could go to Facebook and say, "Hey, by the way, we want you to first disable Facebook accounts for all people who are still running nodes. And then we want you to start posting false information from these people that basically defames them.

[00:16:50] ND: Yeah, there's definitely ways that they could launch different types of attacks against the people that are running them. But again – And it would probably be useless at that point if everyone sold their Bitcoin and there were 5% of nodes running because it no longer makes any sense for people to mine Bitcoin if it's worthless, and they're wasting energy. And there's a lot of like potential to have harm to yourself or your family or something like that. Yeah, I mean – But I guess, fundamentally, like the nodes would probably still be there, a few of them. But as far as the usefulness is concerned, they would, of course, be worthless at that point, because the utility of the token is what brings the value to the network.

[00:17:33] JM: Great. Okay. So we can agree at this point that we do not have meaningfully decentralized uncensorable infrastructure.

[00:17:40] ND: SO I guess it depends on what your definition of decentralized infrastructure. I guess, if you think that there might be a way to build out some infrastructure that is completely able to withstand any political attack, any social attack, any of these types of things that you're kind of talking about, and if that thing exists, then that thing would be more decentralized. But I still think that these things are decentralized by definition in the sense that there's no central source of control that they're controlled by – Or the value comes from the nature of the decentralized nodes that are running by different people that aren't in coordination.

[00:18:25] JM: Yeah, but still, we don't have uncensorable decentralized infrastructure, because as we've just discovered, basically, the US government can shut down any of this if they want to.

[00:18:36] ND: I guess that's a point that can be debated. But I see where you're coming from. Yes.

[00:18:41] JM: Okay. All I'm trying to get at is that we're solving a different problem here than most people think. We're solving shared infrastructure with fine-grained permissions.

[00:18:53] ND: That is one of the main value propositions. Yes. To me, that's probably like one of the most important value propositions. Yes.

[00:19:00] JM: And there are a few applications that we can build with that fine-grained shared infrastructure. For example, money, or smart contracts.

[00:19:09] ND: You're saying there are a few? Or there are a few? Are you saying like –

[00:19:13] JM: I'm saying there are a lot of them. There are a ton of them. This is why I'm excited about this space. There're a lot of things you can do. You can do money. You can do smart contracts. You can do NFT's. And these are all useful applications. But we should not be kidding ourselves that this is uncensorable.

[00:19:28] ND: Right. That makes sense. That makes sense. Yeah, I mean, to me, the really exciting thing about this space is that we are building applications that implement some of the ideas and the features that you're talking about. But we're also building out a new paradigm of application that people haven't even seen yet. So I think that's a really key interesting part of what's going on today, and especially what's going on with NFT's, and personally when I first learned about NFT's, I wrote them off and I thought they were kind of stupid, until I actually understood some of the applications of them in the real world and how people were actually using them by experiencing it myself and seeing some of the roadmaps of some of the teams that are building around tokenization of other items in the real world and how they interact with social media in the creator economy and around how, in the future, everyone is becoming more of a creator. Like 10 years ago, versus today, how many people have massive audiences that they didn't have? How do you monetize that audience?

Well, 10 years ago, or even today, people are showing weight loss pills on their Instagram, and they have 5 million followers. And that's what they're doing with their platform. What if instead they could build out a valuable thing that could be shared within everyone that everyone could benefit from that has actual value and utility in the world like money, and in our case, tokens? So that's one idea. And it may sound abstract, but look at people that are launching these NFT projects today. Artists, they've been working and busting their ass, some of these people, for 20 or 30 years barely scraping by. They now have a platform to distribute their content virtually. They're creating these collections. They're making millions of dollars. And they're also creating residual income, because programmed into the smart contracts, every transaction after that gives them a percentage of the sale. So they launched a collection of 100 pieces. They make a million dollars or even $100,000, which is life-changing to a lot of these people and to anyone. The value starts being determined by the market. It goes up. It goes down. But every transaction that happens on-chain deposits a little money into their account. You've changed the game. You've changed everything at that point.

Now imagine anyone being able to deploy a smart contract, not just artists, but anyone else that has a platform, that has content, that has ideas that they can make popular. Communities form around these collections. That's why you're seeing like these 5,000, 10,000, 1,000 piece collections blow up. Now they're going to go through cycles. It's going to bust. It's going to boom. You're going to have good and bad times. But fundamentally, something has taken hold in the last few months here. And to me, the most interesting thing is the tokenization of real world assets. We haven't even seen the use case where I can go and crowd fund a building in New York and raise $20 million and have people from all around the world be able to buy-in and buy and sell fractions of that building in real time with a liquid market similar to how you would with stocks today. That's where we're headed. And we're headed that way a lot faster than I think a lot of people think.

[00:22:42] JM: All right. And you would agree that all of those applications that you just described are perfectly useful even if we don't have uncensorability. Correct? They're better with uncensorability, but you don't need uncensor ability. Correct?

[00:22:56] ND: Well, when you say uncensorability, I think actually the reason that this hasn't happened today because of how complex it would be to build something like this. With all the

different red tape and all of the different regulations and stuff around transfer of value, there are literally multi-billion dollar companies and trillion dollar industries that have been propped up just to solve the simple idea of me sending you $5. Why do we have Square? Why do we have PayPal? Why does Stripe exist? Why do all these things exist? They exist because there is no native payment layer built into the Internet.

[00:23:32] JM: I mean, it's not the only thing. The thing is like you can lower transaction costs in a lot of different ways. I mean, like rectangle, what we're doing? The basic thesis for Rectangle actually has nothing to do with crypto. It's just basically open source Stripe. It's basically asserting that Stripe is like Oracle. It's just an old database company. And we're just not open source it. If you open source it, you get all kinds of advantages that are going to drive down the costs. It doesn't really have anything to do with crypto. Crypto is super useful though. All they're trying to say is that you've got all this financial innovation that's basically downstream innovation of better infrastructure, better open source tools, better cloud infrastructure. It's just a dividend. It's just a dividend on all these stuff. And I'm going to cut to the chase, because really all I'm trying to drive at is I don't understand why we aren't building blockchains on cloud infrastructure. I don't understand why we're not deploying to AWS, and Google Cloud, and DigitalOcean. What are we doing? Why are we just using cloud infrastructure to power blockchains? It's insanity.

[00:24:29] ND: Yeah, I see what you're saying. Well, imagine, so you're saying why doesn't AWS just launch their own centralized –

[00:24:33] JM: No. No. I'm saying why don't you build Edge & Node on AWS?

[00:24:39] ND: Oh, so they're doing that. Everyone's doing that. Like people are running Graph nodes all over the world in all different types of ways. They're running their nodes in AWS. They're running them on GCP. They're running them on DigitalOcean. They're running them in their mom's basement, and they're running them and they're multibillion dollar buildings in Wall Street. They're running nodes all over the world. There is no limitation on where a node runs. So yeah, I agree with that. Like it makes a lot more sense to probably run a node on AWS for most people, right? Because they can just spin up that infrastructure, it'll be upgraded. You're getting all those nice benefits from the cloud provider. So yeah, I think I agree with you there.

[00:25:16] JM: So if you really wanted to build a great low-cost, perhaps zero-cost transaction system, you can just do it entirely on AWS.

[00:25:26] ND: You could do that, for sure.

[00:25:27] JM: Like I'll do it right now. Spin a bunch of Fargate containers. You got Fargate containers in every availability zone or whatever. You stand up the Nedir blockchain. It just got nodes. It has Fargate nodes in each of these places backed by a DynamoDB instance that's replicated across these different things. Maybe you also replicate it to CloudFront, or whatever. You just make sure it syncs with the same properties of a typical blockchain. Boom! You've got a currency, right?

[00:25:54] ND: Yes, as long as there's no single point of failure. I would say, if one of those transactions does something funky in your system and your system goes down, does the application still run? I think that's one of the really interesting things around some of the stuff in the blockchain space. And I think that what you're talking about should actually work if you have multiple, I guess, instances that are not – There's no single point of failure, I guess you could say.

[00:26:21] JM: Yes. So what are we doing? Like can we have that? Can we have free micro payments now?

[00:26:25] ND: Yeah. I mean, are micropayments something that you all will be working on as well?

[00:26:30] JM: Yeah. I mean, why not? Like I don't know why this doesn't exist yet. Like I thought this was part of the Bitcoin whitepaper. What we promised this?

[00:26:36] ND: Yeah, I mean, there's people doing different implementations. But there is no like way that you can go into your gas station next door and see someone there that you owe like $10 and send them $10 with crypto easily in a way that they probably you both know, because it's so like well-adopted and it makes sense. Instead we're going to use something like Cash App, or Venmo, or something like that. And you need those big platforms there to kind of

make that happen. So yeah, it isn't there. But there's interesting things out there. So for instance, have you heard of anything or read up anything around state channels?

[00:27:12] JM: Is this like the layer two stuff? Or side chains, or whatever?

[00:27:15] ND: It is, I would say, more like – It is something like –

[00:27:18] JM: Yeah, yeah, yeah. It's like the whole Bitcoin thing. Like this is the early Bitcoin. This is the block stream guys. They're always talking about this stuff. Like, yeah, I do the super complicated like key exchange or something to set up like a temporary wallet with like $5 in it, and you can take out $1. And then you have to do like a three-phase commit to take out another dollar. And I'm like, "What?"

[00:27:39] ND: The implementation is really complicated, but it's there and something that you'll see used in actual protocols sometimes. So for instance, with the Graph, you can spin up an API, and you have like a test environment. It's free. But if you want to launch it on the decentralized network, you have to pay just like you might pay AWS. You have to pay an AWS bill. And you basically can set aside like $5 or something now. And then as your API is used, then you'll have these micro payments start, or these micro transactions start adding up, and then it will withdraw $2 out of your $5, and you're left with $3. But you can't really – You're not going to want to do a transaction on-chain every API request, right? You're going to basically roll those up into a big transaction and then make that happen. And then the layer two that we're working with this Polygon.

[00:28:28] JM: So are you doing these state channel thingies in –

[00:28:31] ND: The Graph.

[00:28:32] JM: And that's to fulfill like basic payments infrastructure.

[00:28:35] ND: Yeah, pretty basic payments infrastructure.

[00:28:38] JM: Okay. What if you just do it on AWS?

[00:28:41] ND: What if we did the payments? Or what if someone just wanted to run their own Graph node on AWS?

[00:28:47] JM: Okay. Let's say you do it this way. Okay. You say, "We're setting aside a million dollars in Bitcoin. And we're using that million dollars to seed or stake the –" We'll call it, again, Nedir coin, brought to you by AWS. And it's the same architecture that I just defined. And you say, "Okay, to prove that this thing works, we're going to do a million dollars in Bitcoin related transactions across our network." Like, let's say, we're going to pay our vendors, and you just basically like build an API between – Actually, it's not even a coin. It's not a network. Like it's just a network built on AWS. Or you know what? We'll call it Rectangle. It's rectangle, or a cloud blockchain, or whatever. Call it Rectangle. You got the rectangle network. It's sitting across AWS. And basically, it just serves as middleware to send Bitcoin from one Bitcoin address to another over AWS at zero cost. It's like an alternate way of sending money. And then maybe like the Rectangle network batches a ton of transactions and somehow compresses them and, I don't know, sends them over Bitcoin periodically so that you have more efficient, essentially, like, I don't know, however many transactions you need. Or you do it over Solana or whatever. Like whatever fully decentralized blockchain. Essentially, use Rectangle as your side chain.

[00:30:09] ND: Yeah, that makes sense. I think that there are layers and I would say a spectrum of decentralization. And there are different ways that you can implement pretty much anything. But yeah, I mean, you're basically going to be using a database to keep up with the transaction and do the transactions based on the updates in your database. Yeah, that would work fine as well.

[00:30:29] JM: Sweet.

[00:30:29] ND: I think, though, that you have different people that care more about, I would say, the idea of decentralization than others. So for instance, a lot of the things that you see happening in this space are typically made out to be things like progressive decentralization. So progressive decentralization means that you work with what you have. And if you can't find a way to do what you want to do in a decentralized manner, you use the tools that you have until that technology or that thing exists. And it doesn't stop you from launching early. It just stops you

from launching in a fully decentralized way. And then over time, you become more decentralized.

I mean, we are one of the examples of that. We first had the idea around what the Graph would do. And it was basically an idea. And it was not a proven idea. It was more just an idea. So it would have taken years to test out this in the real world, because they would have to have built out the entire network and then launched it. So instead, what they did, they built out a proof of concept and shipped it as a hosted service, like a centralized service to see if people use it. And people did use it. Uniswap used it. Foundation used it. Synthetics, a massive number of DeFi applications and a large percentage of applications in the Web3 space used it. So once you prove that the idea is there, then you can start building out. And they were already building out like the decentralized – The code to kind of make this decentralized during that time. But in the process, proving that it worked made a lot of sense, because why would you want to spend four years building something if it wasn't going to work? And then now that they've launched the decentralized version, we can now migrate people away from the hosted version, those who are interested in decentralization, I guess you could say.

[00:32:26] JM: I mean, don't get me wrong, I want decentralization as much as the next guy. But if Jack Ma can be imprisoned in a bedroom and have Alibaba taken down, certainly the same thing can happen to Jeff Bezos, and AWS can be taken down. I'm not denying that.

[00:32:42] ND: Yeah, yeah, absolutely.

[00:32:43] JM: But I'm basically saying, "Look, let's just admit to ourselves that we can't have uncensorability. We basically can't have decentralization yet." Like I'm so grateful for the crypto community. I'm super grateful for it. I'm super grateful for Satoshi who are what he or she is, or they. But like we have to acknowledge where we're at. We're just nowhere close to actually doing this the way that we want to. So we have to basically do all these half steps, these half measures, as we just basically strong arm the entire world into adopting decentralization. And one of the steps along the path is, from my point of view, building a zero-cost payments network over AWS, and DigitalOcean, and Google Cloud replicating across all the cloud providers so that it's effectively decentralized. It's just decentralized across corporations rather than individuals.

[00:33:31] ND: To me, one of the biggest problems that threatens the idea of decentralization, as it stands today, is the pegging of tokens against a US currency or a currency that is used that as a fiat currency. So for instance, if the entire market has like a 30% drop when the stock market and like something disastrous happens, you're going to see crypto prices fall along with that, because it's pegged against the value that you might consider withdrawing back to Fiat, because everything is pegged against US dollar, which is pegged against oil for the most part, right?

But what if we had a token that was not volatile based on fiat or something in the real world? To me, that would bring another improved, I would say, layer of decentralization in the sense that even if the entire world was crumbling around us, which it probably wouldn't, but let's say something bad happens, or there are these targeted attacks, the network itself isn't dependent in the trade that's happening between parties, I would say, isn't dependent on some store value external to the network. Instead, it's pegged in some other way. And I don't know what that would look like. But let's say 10 years from now, everyone is using X payment network. Maybe it's your payment network. You would want it to be to the point where you can buy a car or you can buy a cup of coffee and everyone has the user interface to interact with this and everyone is able to actually get liquidity in it. Like I can get paid in this and I can pay other people. I can do my job and accept payments and things like that. And then it's not really dependent on an outside, I would say, factor, like the US dollar.

[00:35:15] JM: We already know at this point that engineered stable coins are a lie. These things don't work. Stable coins –

[00:35:24] ND: Yeah. If stable coins worked, we would have the answer. I mean, stable coins serve a purpose. But if they worked in the way that I'm saying, then we would have the answer to that question, but we don't. So I agree is I guess what I'm saying.

[00:35:37] JM: There's no such thing as a stable coin, because all assets move relative to one another. The most stable coin, by our conventional definition of a stable coin, is the US dollar. The second most stable coin is probably – What's the Chinese currency? Renminbi or something? Renminbi? What is it called?

[00:35:56] ND: I don't know.

[00:35:58] JM: The Chinese currency.

[00:35:59] ND: It's not the yen?

[00:36:00] JM: Or the yen. The yen, right. What's the Renminbi?

[00:36:02] ND: I'm not sure.

[00:36:03] JM: It's something else. You've heard that word, right?

[00:36:05] ND: I feel like I have, yeah.

[00:36:06] JM: Okay. Alright. So the yen, or the Renminbi, or whatever. So it's the Chinese currency. That's the second best one. And then, I don't know, maybe the third best is like Amazon stock, or Apple stock, or something? Like that's how currencies are ranked. There's no stability. It's just a ranking. It's all relative. It's all relative.

[00:36:24] ND: So how could you programmatically build that into a system that it's relative to another part of that system maybe?

[00:36:31] JM: It's all trust. It's all, "Do I trust this asset?" Because an asset holds it to value, essentially, by fiat. Even if it's not technically a fiat currency, there is some connection between this asset that I'm holding and whatever technically is like guiding the value of this asset through time as measured by the aggregate judgment of people who compose the market, right?

[00:37:01] ND: Yeah. And that's what's happening like now. The token economy has thrown a fucking wrench in that archaic old system the way that we've been used to doing things in the fiat world. Why are you seeing these pictures of rocks selling for 200k? Or a picture of a penguin that sold for $400,000 that was worth $200 a week ago? Or you're seeing these NFT's like CryptoPunks sell for millions of dollars? What does that mean? And I think that what we're

saying is that there's been a wrench thrown in what people think of as value and stores of value. Because to people living in the real world, not in the metaverse, and they're working, and they're making $10 an hour, and someone can buy a picture of a JPEG and sell it a week later for as much money as they make in 30 years, something is happening. And I'm not saying it's a good thing or a bad thing that these things are happening, but they are happening.

So like what does that mean? Like how can we make this more accessible to everyone in the world to participate in the future of this thing that will continue to grow? And what do you think about what's happening in the NFT space? I mean, obviously, it's some sort of bubble. But I do think that, over time, it will be a massive, massive part of society and the way that we think of stores of value, because we've thought of stores of value in ways that we're used to conceptualizing. But when people look at this, they can't conceptualize it when you talk about it, because it's hard to understand. And yeah, it's just a new paradigm, right?

[00:38:39] JM: I mean, they're a new paradigm in the same way that Beanie Babies were a new paradigm when they came out. It's just a collectible that is arbitrated by a proof of authority system. And the proof of authority system, in this case, masquerades as something decentralized or unsensible, but it's basically a lie.

[00:38:58] ND: I mean, I guess, to me, the really interesting thing about this is that if you had a baseball card, or a Beanie Baby, for example, let's say a Beanie Baby, and you bought this Beanie Baby for $1 and then a year later, or six months later, it's worth $1,000. And you wanted to sell this Beanie Baby to someone in South America. How are you going to facilitate that?

[00:39:21] JM: Oh, sorry. You're saying if I want to sell a Beanie Baby to somebody in South America, how am I doing that?

[00:39:25] ND: Yeah, how would that transaction be facilitated? Well, it'd be facilitated before the Internet probably by a phone call. Maybe you advertise it in a newspaper that somehow you have to print a million copies of around the world to kind of let people know about it. But let's say that the Internet exists and you put it on eBay. And that person would have to go to eBay and find that. They would have to sign up for an account with eBay. They would have to sign up and handover all of their personal information, their email address, their phone number, maybe even

their social security number to PayPal, and they would have to get verified and then they would have to link their bank account. You would have to do all that stuff as well. And then they would have to transfer that value between those two parties and you would have to drive to the post office and buy a box and write down their information. And then they would ship it in the mail. And it might show up two weeks later, or it might get lost. That was the digital transfer of art.

And I kind of look at NFT's more in this sense. Actually, you can't compare them to art or to Beanie Babies, though they share characteristics with both. Instead, you could think of, in my opinion, like a store of value. And I think they represent the thing itself, of course. But imagine, again, the application of tying an NFT to a piece of property and then tokenizing that NFT. So there're these two standards that you see in the blockchain space, especially Ethereum. You have ERC-20 and you have ERC-721. ERC-721 is what makes an NFT. It's a non-fungible token is just tied to an individual thing that is recordable either by itself individually or part of a collection. And then you have ERC-20, which is what people use to mint cryptocurrency tokens. So for instance, GRT is an ERC-20 token. I can go to OpenZeppelin and I can download this code, and I can run it and I can deploy a million Nader Dabit tokens to Ethereum with a few dollars, and then I can sell those tokens on the open market.

Now what is going to happen and what's already happening is the fractionalization of properties that now get distributed in a way that just never was able to happen before. I can go and I can purchase a piece of property on my own or I can crowd fund it. We tie that one piece of property or – When I say property, I'm talking about physical property, I'm talking digital property. I'm just talking about property like what is property? You tie that piece of property to an ERC-721, then you can tokenize that using ERC-20 and make, let's say, 1000 fractions or 100,000 fractions, and you can put those on a liquid market.

Now everyone in the entire world can go in and they can buy and sell fractions of that permissionlessly, easily without having to go to the bank and get a loan and go through all the process. Let's say people that are making $100,000 a year living in New York, they can't even pay their bills. You think any of those people are investing in the real estate that's going up 2X or 5X in the course of 10 years? No. But this gives people the opportunities to kind of get in on these markets. To me, it lowers the barrier to entry for people to participate in high value, highly liquid financial markets and financial systems around the world that were unable to in the past. I

think it kind of lowers the barrier to entry. You're going to have, of course, the really rich people that are going to come in and buy a lot of this shit. But you're also going to see everyone else have the same – They're going to have the exact same opportunities as well. That's the way I kind of see the NFT market. And I'm not talking about the penguins and all that stuff. But it's more of like a representation of what is to come, to me.

[00:43:04] JM: So are you a Magic player at all? Magic the Gathering?

[00:43:06] ND: No, I'm not.

[00:43:07] JM: Oh, okay. Well, so I played Magic the Gathering. I have played it for a really long time. Wizards of the Coast did this thing that really angered me. So Wizard of the Coast is the company that makes Magic. Magic Online is a game that is like probably 17 years old or something. It was made when I was in middle school or high school. It allowed you to accumulate a collection of cards. And you can buy these tickets, and the tickets are basically like a one-to-one dollar 1 to ticket ratio. So kind of digital gold sort of thing. So it's a big digital gold collectibles competition world. Really, really fun. I played a lot of Magic Online growing up. More recently, Wizards of the Coast decided to release a brand new Magic the Gathering online experience called Magic the Gathering Arena. Your collection in Magic the Gathering Arena has no correlation with the collection that you made in Magic Online. So basically, you have to start from scratch. It's like a brand new interface that they developed. You start from scratch. And don't really GAF. Like they don't care. I don't even care, because I gave up on Magic a long time ago from a collectible standpoint. Like it's just a fake collectibles world. A lot of the cards are fake, and they won't admit it. Like it's just a fake world. And like that's kind of how I look at the NFT space is like, "Yeah, are you really telling me that this NBA Top Shot thing is like unique and it's always going to be unique and you're never going to tinker with the marketplace? What?" It's like a three-card Monte Ponzi scheme BS fest that people are falling for, and that's fine. Like that's totally fine. But don't tell me that this is like anything new. It's not. It's just a digital world. It's all it is. It's written to a database somewhere. That's all it is.

[00:44:55] ND: So I think that what you're seeing is, for example, there is like a new – I don't know if it's like an art gallery, or if it's just someone that built this new thing that no one's seen before or what it is. But I know people in this space that have bought some of these NFT's, I

would say, a little earlier on. I don't know about Top Shot, but I'm just kind of giving you an example of what I'm already seeing people do to monetize some of these things. So there is a gallery in LA where they basically showcase different art from – It's basically called NFT art. And in order to kind of showcase your art there, you can basically just get in touch with this art gallery somehow and they can basically show your art there.

Now, if I own like an NBA Top Shot, right? Or I own an NFT. Like who says that it's valuable? Like does anyone actually say that it's valuable? Or is it just valuable because I think it's valuable? And right now there is a "sucker" that might pay that amount for it. Like where does the value come from? So that's the question that needs to be answered, right?

To me, the interesting thing is like people are encouraging the use of their NFT's to be used all over the world. So the Mona Lisa, for example, is something that people always bring up and because it's a known piece of art. What's stopping me from going and getting a copy of that Mona Lisa painted by some really professional artist and then going and saying that this is my Mona Lisa? Like who is the person to prove that that's not the case? Like why can't I just go and reproduce a Mona Lisa? Well, the reason is that there is a trusted authority that you trust to kind of say, "Hey, no, the real is over there in the Louvre in Paris, and yours is fake." Like that's it.

But I think it's good for the Mona Lisa to be taken and used in pop culture and people wearing T-shirts and people talking about it on this podcast, because the more that it's brought up, and the more that's talked about in society, the more famous it is, and the more "valuable" it might be to other people. The same thing goes with like these art galleries. So if people are using my art, and they're using it on T-shirts, and everyone knows about it, the perceived value might be to someone out there. I'm not saying it's worth the amount of money that you're seeing it going for today. Again, I'm not sure what's going to happen. You're going to see these boom and bust cycles. But I think that there's culture, there's community, there's the licensing. Like if someone, some movie wants to kind of do a documentary on my shit, I might charge them like some money to license it, or I might just let him use it for free. And then maybe when I put it back on the market, someone might be more interested to buy it.

But as far as Top Shot is concerned, I guess the trusted authority is actually the NBA, because they're the ones that are saying, "Hey, we're never going to do this again. Like this is how we're –"

[00:47:46] JM: That's fine. Why do they need a blockchain? Why do they need NFTs? Why do they need any of this crap?

[00:47:51] ND: Well, I don't know. A lot of the blockchain that they're using, but I know they're not using –

[00:47:54] JM: I don't care what blockchain they're using. It doesn't matter. You just told me all I need to know. It's a proof of authority sponsored by the NBA.

[00:47:59] ND: Yeah, there you go. So like I guess the people – I'm not saying that Top Shot is good or bad. I don't have any of that stuff. But I'm assuming that the people that are buying into it trust the NBA enough that no one's going to go and like –

[00:48:11] JM: So is it NBA chain? Is it NBA chain? Is that what we're doing here? Like do these crypto people understand that they're just buying digital baseball cards?

[00:48:20] ND: Yeah. I mean, it's hard to say what people think that they're doing, what they're not doing. Like what do you think about the way that art is bought and sold today? For instance, my friend is a really great artist. His name is William Goodman. He lives here in Mississippi. I bought his artwork like 10 years ago. And it's amazing. But like let's say that he creates a really great piece of art and he wants to sell it to someone on the other side of the world and he does it today? Well, today, we have that same thing. We have to transfer that money somehow. We have to get on the market somehow. We have to put it in a box. We have to ship it. It might get fucked up on the way. It might arrive perfectly fine, either way. But the process of transmitting that art is actually very laborious. More and more people are actually creating really, really cool ass digital art, but they haven't been able to monetize it. They've been able to create cool shit and give it away on Instagram and Twitter or share it. But how do they actually – If you create something in Photoshop, how do you sell that thing and tie it to someone? Where was that trusted authority before this came out? I guess there was probably art.com. I don't know.

There's probably some website where you could do that. But you still had to go through that platform that owned the content. There's no API that is accessible by anyone in the world. You have to have the payments go through them. It's very, very locked-in. Like you can't fractionalize it. Take what you can do today that same artists might come up with something really, really cool. And they mint it as an ERC-721. Immediately, there are literally right now today over 100 NFT marketplaces that it can now show up on. And that's going to go up even more, right? Because the more people that can build on top of this permissionless infrastructure, the more that it's just going to just be out there, right? Because like if there are 100 marketplaces today, and we're just like at the early stages, or maybe we're at the bubble and it's going to go down from here. Who knows? But let's say, theoretically, it 10X's from here, they can now get 1,000X visibility. They can now get payments directly between parties that goes from their wallet to another wallet. But to me, this isn't even like happening. I mean, it's happening, but it's not the most thing that's like, extremely well-adopted yet. But if you if you look at something like fractional.art, I can actually take my piece, upload it there and break it into a thousand other smaller pieces. And everyone that wants to buy in can buy a percentage of that. And the value goes up and down based on the demand. So you can basically invest in art. And the artists are getting fucking bank right now. When I say they're getting paid, like some of them aren't making like hundreds of thousands or millions, but compared to what they were making, it's life changing. And I think you're now just seeing the creation of the first wave of a digital marketplace for digital artists. And it's tying together the influencer economy. It's tying together to create our economy. It's tying together software engineers. It's tying together social media. And I think the next thing that we're going to basically see is some type of social media platform that replaces Facebook or Twitter, but it does so in a way that we really haven't imagined yet. But it's going to actually have some type of this thing built in, because now all of these ERC-721s are floating around on the chain. How can we integrate that into some social media application by default, right? Like how can that happen? I don't know. Someone's going do it, though.

[00:51:46] JM: I mean, but here's the thing, man, like you don't need a blockchain for the next phase of social media. It just needs to be open source. It needs to be open algorithm. It needs to be open operations. Open source, open algorithm, open operations, we need to –

[00:52:03] ND: But what does open mean?

[00:52:04] JM: Open means you disclose what's going on in your company.

[00:52:08] ND: Is the code completely open? Is the backend completely open? Like all that stuff open?

[00:52:11] JM: It's sufficiently open. Sufficiently open. Whatever that means, we'll figure it out. But it is not what Twitter is doing. It is not what Facebook is doing. I know, because I just wrote a book about the company.

[00:52:21] ND: There we go. We agree on that.

[00:52:25] JM: I mean, it's embarrassing and it's shameful where we are in terms of social media. It's a tragedy. I really wanted to ask you, like you have some background in like having to like escape a country or something, right?

[00:52:37] ND: Well, no, not really. I just have family. And my dad is from the Middle East. So my dad was born in a city called Lod, which is now part of Israel. And he grew up in the west bank in a city called Ramallah. And we have family and friends and Syria, in Lebanon. And actually, to me, one of the interesting things about this space and maybe even about what you're doing with your company is the ability to have some type of a global payment platform that is not censurable by the government, or that doesn't have government control. Because in Lebanon, if you had a million dollars in the bank, or let's say you even had $100,000 in the bank, or let's say you had $10,000 in the bank, whatever. It's not just a plot to rich people, or whatever. One day, those people woke up, and they were unable to withdraw their money out of the bank. And on top of that, inflation is going up 1,000% a year. So they can withdraw $100 a month. Within one year, they can only withdraw $1,000. And then on top of that, the worth of money goes down by 90%. The government did that. They woke up and then put those restrictions in place because they had a run on the bank, or they wanted to prevent run on the banks because they didn't have enough money to pay back to all those people because they had lent it out to the government. How do you prevent stuff like that from happening? And in turn, that crushed people's lives. That crushed people's businesses. You have economic refugees that had to leave their families and their businesses and their homes to go work other

places because everything is just fucked. And that's not even as bad as Venezuela or some of these other things. So yeah, I mean, you've probably heard this story a million times. And that might also be why you're interested in this space. But, yeah.

[00:54:16] JM: Yeah. And just on the social media front real quick, like I just – So everything that I think about social media is kind of what I'm putting into practice with softwaredaily.com, or at least that's one dimension of social media that I think about a lot. I really like what Quora did in the past. They kind of fell on their face a little bit. But what they were doing originally was very profound, essentially an intellectually focused social network. But Facebook, and Twitter, and Instagram, and TikTok. These things are like the lowest common denominator of human interaction. They really cater to the worst of every human impulse. And that's why they can't really open source what they're doing because it's just so mischievious and horrible.

[00:55:01] ND: Yeah, when you say they cater, you're basically saying that their tactics around attention and data gathering and advertising and stuff.

[00:55:09] JM: I mean, they drive us to be enemies with each other.

[00:55:13] ND: Yeah, exactly. Yeah. I agree 100% with that. I mean, this isn't the way that the Internet was meant to be. But it's an evolution of the Internet. And I think that it's great that people are recognizing this and they're attempting to build stuff. And that's one of the interesting things to me about this space in general, is that a lot of these people are not only they're just excited and motivated to build out something that replaces all that. But a lot of them have left those situations. A lot of these people are leaving Facebook, and they're leaving the Microsoft's, and GitHubs and stuff of the world. And they're coming into this "space". Like they might be working doing the types of stuff you're doing. But they're doing stuff that's in the "Web3, decentralized, permissionless world".

[00:55:58] JM: Yeah, and I have a simple piece of advice for them. And that is to build using cloud infrastructure. Very simple piece of advice. Like why wouldn't you?

[00:56:06] ND: Yeah. I mean, there's a million ways to get the job done. And I would say do whatever is making the most efficient.

[00:56:14] JM: So you saw this at AWS. So my thesis here is basically like we're undergoing a renaissance. It snuck up on us. But we have a renaissance. And the renaissance is smartphones on the consumer side, or I should say on the demand side for compute. And then cloud computing on the supply side. Cloud computing gives you unlimited computing resources on the server. And mobile gives you unlimited demand, because now have a device that is with you at all times. You can always improve the user experience of walking through space and doing stuff. That's what your mobile phone is, or whatever your device is. We need people to realize that these two things alone are really all we need to get to like some base level of human flourishing for every person in the world. That's really all we need. We have everything we need. We just need to start doing the engineering on top of these things. We have started. All the things that we're seeing that feel like magic in our everyday lives, those really are the result of just cloud meets mobile. It's that simple. That's really all we need. The blockchain idea is awesome. I love it. It's great. We need it. We do need it. But we can't get there yet. We're just not anywhere close to having uncensorability. So let's like kind of throw out the uncensorability. Let's give Satoshi like an applause. Let's give Vitalik and applause because they've done super important work. But ultimately, in pragmatic terms, it's not realistic.

[00:57:38] ND: I think that you have really great points. I don't think that we're like all the way there yet, but I'm a little more optimistic that we will get there.

[00:57:45] JM: I'm not pessimistic. I'm optimistic. I'm optimistic we'll get there. It's beautiful. It's a beautiful vision. But are smart contracts going to look like a platform that hasn't been able to scale for four years, three years, five years? How long have we've been trying to do layer two double backflips?

[00:58:04] ND: Yeah. I mean, I think that you said the key word there. I think the smart contracts, in addition to the actual consensus mechanism that is a blockchain itself, but the smart contracts where you're actually able to build in the native payments. Those two things are the groundbreaking achievements or the groundbreaking ideas. Now, we are now in the scaling phase. Yeah. So like people are attempting to scale. And I think that we're getting there. But yeah, you can't use Ethereum to do a lot of the things that you would need to do for most applications.

So yeah, I mean, Web3 in blockchain isn't for every application. But I do think that it is a great place to build certain applications even today. But it's a very small number of types of applications. And I think that use the best tool for the job. And I think that, right now, blockchain is not the right tool for a lot of jobs. And we have highly scalable, really, really well adopted and mature things like AWS like we mentioned that are scalable, and they are ready for real world applications today and, of course, that they have been for years. This isn't like a new thing. They're just getting better.

[00:59:14] JM: So let me change the topic a little bit. I was at KubeCon, I think, three years ago. And at Kubecon, it's really interesting, because you would think of it as a distributed systems conference, the Kubernetes conference. I think this is actually in 2017, 2018, whenever that crypto run up in 2017 was happening, late 2017. It was Kubecon Spain or Copenhagen. I think it was Copenhagen. And I would just ask people like, "Hey, what do you think of crypto?" And they'd be like, "Oh, you mean the Ponzi scheme?" Like the thing that's not worth anything? The thing that's a joke. And I'd like, "No, no, no, no, it's actually the future of distributed systems. Like what you're doing today is going to be outmoded in 10, 15, 20 years, because crypto, blockchains are a fundamental computer science breakthrough." And they'd say, "Oh, you mean like the rampant speculation like BS fest?" I'm like, "No, you don't get it."

And then you go to the crypto people and you say, "Hey, have you heard of Kubernetes?" And they'd be like, "Oh, you mean the centralized, easily censurable thing from Mark Zuckerberg?" And I'm like, "No, no, no, no, that's not what it is. It's actually like a really, really cool infrastructure breakthrough. It's actually not an infrastructure breakthrough. It's more like Google marketed something successfully. But it's actually useful that Google marketed it successfully, because now we can standardize on it, even though we probably should be standardizing on HashiCorp Nomad. But like, it's okay, we can just standardize on Kubernetes. It's pretty good. Let's do that." And they're like, "No, no, no, no. We need to do everything in decentralized blockchain manner. I'm like, "Do you write all your code in Assembly? What are you doing?"

[01:00:39] ND: Yeah, it's impossible to do any type of high throughput compute right now. It's not possible. I mean, that's the thing. Yeah, it depends on who you talk to. I don't think that's good to be a maximalist of any sort. I think that you have to be cognizant that everything has a

tradeoff. And if you literally can't even sit there and see the value of something like Kubernetes, then it's not even worth talking to someone like that. And I would say like I don't see that much of those types of people these days in this space. I think that you do have some people that are like that. But in general, I would say that people have an understanding about what can and can't be done. And it takes a while to figure that out.

I think that when you first learn about it and you get into the space, you learn about it. You just want to do everything using the tools that are here. But then you quickly realize, "Oh, you can't do everything." In fact, you have to kind of only do these set amount of things that you can do today. And of course, we want to work towards doing more. But right now, you just can't do that. So you work with what you have. And the same thing goes for like the cloud space. Same thing goes for any technology. You understand the tradeoffs, and that's part of being, I would say, like a mature and senior engineer. You kind of understand the tradeoffs and use the right tool for the job.

[01:01:54] JM: When you were at Amazon, did you do the big ideas competition?

[01:01:57] ND: I mean, I don't know if this is the same thing. But we basically have these OP1 –

[01:02:02] JM: No, no, no. Not that. Not that. Not that. There's a competition. Maybe you didn't see it. When I was there, they did the big ideas competition. It's pretty cool.

[01:02:10] ND: No, I didn't participate in that.

[01:02:12] JM: Is AWS run like a totally different sandbox than Amazon?

[01:02:16] ND: It is pretty different. I don't know how much different, because I've ever worked at Amazon. I've worked at AWS.

[01:02:20] JM: Interesting. Well, are the leadership principles the same?

[01:02:24] ND: Yeah, the leadership principles are there.

[01:02:26] JM: Interesting.

[01:02:27] ND: We probably had it, and I just didn't participate or didn't know about it. I don't know.

[01:02:30] JM: Yeah. So when I was an Amazon, I didn't actually do work. I just did the big ideas competition for basically eight months. I just like wrote six pagers and just like sent them to people in the company and they just like responded angrily. That's what did at Amazon. I loved it. But I was just going to ask if you got anything like totally off the ground at Amazon. I tried to get some stuff off the ground unsuccessfully. But did you –

[01:02:53] ND: No. I didn't. I mean, I had proposed a few ideas that were somewhat implemented. So I mean, and they have been implemented without me doing it. But like one of the proposals I had early on was the idea of a really great CMS. So I wanted to kind of have like a competitor to what is now things like Contentful. And I kind of propose this at a time that if we had actually done it, it would have actually been really successful, because those CMSs are fucking crushing it. And instead of implementing it, they waited a year. And then they implemented like a really, to me, stripped down version of that, which is fun.

[01:03:26] JM: AWS, was it a CMS product?

[01:03:29] ND: Well, AmpliFi admin panel has a CMS component to it, yeah, that you can go in and basically edit, markdown and stuff like that.

[01:03:38] JM: That's kind of cool.

[01:03:39] ND: Which I'm still a huge fan of AmpliFi serverless. I mean, I really enjoy working for that team.

[01:03:43] JM: Oh, for sure.

[01:03:43] ND: Those are great people. And I love that technology. That was my passion. And it's still kind of is.

[01:03:49] JM: Does Firecracker solve the cold start problem?

[01:03:52] ND: I don't know enough about Firecracker to answer that.

[01:03:54] JM: Okay. Got it.

[01:03:56] JM: I mean, just seeing AWS move into the hardware space has been so exciting.

[01:03:59] ND: Yeah. seem interesting, right?

[01:04:01] JM: Seeing them do Outposts, and Firecracker, and Nitro, and all this like full stack stuff is amazing. Although what concerns me is the Amazon sidewalk thing, like the network. That's not okay.

[01:04:15] ND: That was just weird that. Like why would you do that and like not really talk about it in advance or just run it by people? Like you don't just do something like that without breaking –

[01:04:25] JM: Well, so this is the thing. This this is why power corrupts, absolutely. It's because like Bezos doesn't even really control the stuff anymore. Like I trust Bezos' ethics, like through and through. Having worked at that guy's company – I mean, maybe I shouldn't trust him. Maybe I'm too gullible. Maybe he's going to take over the world in one fell swoop at some point, but I don't think so. I kind of trust the guy. Unfortunately, his company is so powerful. And there are org structures and power structures within it just like there are at Google and Apple and everywhere else that these places can be essentially corrupted. And that's why we need decentralization at a fundamental level. But I think, today, I think what we need today, is we need basically a way for each of these companies to have a check on one another. So Apple should have a check on Facebook. Apple should have a check on Google. Google should have a check on Apple. They all need to have checks on each other, because they're just too powerful.

[01:05:16] ND: That makes sense. That makes sense. Yeah, I mean, I agree with that 100%. I don't know if I would build checks into the system. I think I'm a little more hardcore than that. I'd say we take all of them down by building better versions of those.

[01:05:29] JM: No. But you can't do that without first using them against themselves, which is why I'm saying like you have to build a blockchain that is shared among all the major cloud providers. Because in that manner, you can create infrastructure that actually they all rely on. So you can create a circular dependency. If you build a better financial system on top of the cloud providers and then you force the cloud providers to rely on that financial system, you create a checkmate situation.

[01:05:55] ND: Yeah, I see where you're going with this. But I mean, why do we even care about the cloud providers? Like I mean –

[01:06:01] JM: Are you kidding me?

[01:06:02] ND: I say we should use them today. But I'm saying like, in 10 years from now, does that even matter? Like 100%, they need to exist today. But I truly think that people are building out protocols and things like that that will offer similar ways to basically run some of the services that they run. To me, I guess, where I'm going with this is that AWS and GCP will always need to exist, and they'll get better, because people always need a place to deploy some type of cloud infrastructure. What I don't necessarily know if they will continue to like thrive and exist are maybe some of the stuff that they're doing around managed systems maybe in 5 or 10 years. If things – I wouldn't say that they're not going to exist actually. But, basically, what I am thinking is that you will have alternatives to that. You will have decentralized alternatives, many of them actually running on AWS nodes. But they will offer ways to do things that give more ownership to people that are not AWS. So if I want to participate in a protocol that offers some type of serverless compute and someone builds a protocol that allows me to do that and I can basically run in one of these nodes in a container, like on AWS or something like that, and then I can basically charge the amount that AWS typically charges for serverless functions, but the money is instead going to the node operator and they're just paying their costs for their Kubernetes cluster or whatever. To me, that's cool shit right there. I don't know if we'll ever get there. But like, to me, that's really interesting. Those ideas, if that makes any sense.

[01:07:44] JM: Yeah, yeah. No, it makes sense. But like, what do you think of this idea of just like if you build a blockchain over all the cloud providers, and then you basically build a better financial system, you build API's on top of that financial system, you make them so good that the cloud providers have to adopt them as a financial system in order to lower their costs. Therefore, you have a circular dependency. They can't shut down your financial system, because they depend on you. And then you can basically do the same thing to the smartphone providers. And then you essentially have a financial system that rules over everything, and it's decentralized.

[01:08:14] ND: Isn't Amazon hiring and doing some stuff in the blockchain space? Hiring crypto payments or crypto –

[01:08:20] JM: Who cares?

[01:08:20] ND: Aren't they doing something in the blockchain?

[01:08:21] JM: Who cares? Who cares? Nobody wants this to be done by Amazon. This can't be done by Amazon.

[01:08:26] ND: I agree with that. But I'm saying if they're – But what I'm saying is we don't have to make them adopt – We don't have to get them to agree to adopt anything. But the entire world adopting something, they're forced to adopt it. Right now they're being – I think they're going to be forced to adopt digital payments on a blockchain that they have no control over, because everyone's already using it. They're going to be forced to –

[01:08:46] JM: But nobody uses it. But nobody uses it. There're no micro payments. Everything –

[01:08:50] ND: No, no. Not yet. Not yet. But I mean, they're hiring a payments person. Obviously, they're considering it. Hiring someone to run the digital payments. And from what I understand, they are building out like a pretty massive team. And they have a massive operation

that they're hoping to kind of launch. And they're probably aware that this isn't – Like these micro payments aren't something that's a thing today. But in a year or two years, they will be.

[01:09:12] JM: Due, we already know what this looks like, though. We already have Stripe. We already have Stripe. We already know what Stripe is trying to do. It's the global payments and transactions, whatever. Global payments and treasury network. It sounds like the most stupid cabal thing I've ever heard.

[01:09:26] ND: I don't know anything about that actually.

[01:09:28] JM: It's just a big proprietary cabal of payments things. Who cares? We don't want your planned economy, Stripe. We don't want anybody's planned economy. We need a decentralized system. And it's going to use cloud providers because cloud providers have the best infrastructure we have today.

[01:09:45] ND: Yeah. I mean, the cloud infrastructure is a huge part, but it is an implementation detail, right?

[01:09:51] JM: Well, it's a very critical implementation detail because I want to use the proprietary AWS API's. I want to use the proprietary Google Cloud run API's. I want to stand up all this stuff on cloud providers in a multi-cloud manner. I want to replicate the transactions across these different cloud providers. I want to have tamper detection across these different cloud providers. I want Linode to have a gun pointed at AWS. I want AWS to have a gun pointed at GCP. Let's say Solana. I want Solana cloud to have a gun pointed at AWS. Like there's no reason we can't replicate the same transaction log to Solana. Maybe over time, Solana becomes better than all these other things. Then like Solana becomes the best cloud provider. Then maybe Solana stands up a Fargate thing. Like that's fine. If Solana wants to build all the API's that AWS has underneath, like this financial system, that's great. The thing is we need the universal financial system. The problem is it's not Bitcoin. It's not Bitcoin. Or maybe it's Bitcoin, but if it's Bitcoin, we have to re-launch it on top of AWS. On top of all the –

[01:10:55] ND: Right. Bitcoin is obviously proven itself not to be something that people already use.

[01:10:59] JM: It's a reference implementation. You know all we need to know about Bitcoin, because like we couldn't make smart contracts work on top of Bitcoin. And the only reason we couldn't do that is because the throughput sucks. So Ethereum doesn't solve that. Ethereum is just a marketing exercise. It's like we're doing the same thing, but we're doing smart contracts, and the throughput is still terrible. It doesn't solve anything.

[01:11:25] ND: Yeah. I mean, I disagree with you there that it doesn't solve anything. I mean, I think if it didn't solve anything, there wouldn't be like the massive increase in usage and stuff. I mean, I agree to disagree. I mean, it's not the most optimal thing, but it's –

[01:11:41] JM: It's another reference implementation. These are reference implementations.

[01:11:43] ND: I mean, it's like an evolution, right? Like it's not the final form, right? Like we're not anywhere final. Like we're going to continue improving. Everyone will. And things are going to come. Things will go. Who knows? Ethereum may not be around in 10 years. It may be around in 10 years. I don't know. I'm not saying that it will be. But I think it is proving to be worthy of usage based on the massive like increase that you're seeing. And then hopefully, with some of the additional merges and stuff, they scale it. And if they don't, then they're going to lose out. Like you see Optimism and Arbitron, which are basically layer twos that promise to increase the throughput that inherit the same security model of Ethereum. We'll see what those things start looking like.

I mean, if you look at the adoption of Optimism already, and I don't know if I remember seeing this chart correctly, but it looks like that optimism already was doing larger a number of transactions in Ethereum itself. Let's say that you see sharding happen along with these layer twos and layer twos improve, you might see the throughput increase by 10x, 100x. It's still not where it needs to be though. That's still not something like DynamoDB or something like that. So yeah, I mean, you improve and you adopt more use cases as you improve, but you're never going to probably be as – Like based on physics, you're never going to probably be where something like DynamoDB is, right? Because DynamoDB has three partition. I mean, three – I think it's like three replicas that end up basically combining to be the main –

[01:13:14] JM: Yeah. But, dude. I mean, okay, so this is like – Oh my God! Don't get me started on blockchains here. So I have to go in four minutets. By the way, dude, I miss you. When am I going to see you?

[01:13:22] ND: This is a great conversation. I appreciate your perspective. And we should do this more often.

[01:13:27] JM: Listen. I had a lot of time to think and brood during the pandemic.

[01:13:30] ND: Yeah, this is cool stuff. I mean, I'm going to be in Atlanta. In September, I'm going to be in Croatia. In September, I'm going to be in – I'm sorry. I'm in Atlanta in October. Croatia, September. I'll be in Amsterdam and London in October.

[01:13:43] JM: October. London in October. Maybe I can meet you in London. That'd be fun.

[01:13:46] ND: Yeah, I can text your email you –

[01:13:49] JM: Yeah, yeah. That sounds fun. Okay, but last moment, I'm not even going to like try to end this on like – It's going to end in a transitory note, because I have to go in like three minutes. But I just want to say, I just want to critique one point that you made. And I really like that we have a vociferous debate and still be friends. But like the N of three things, like if you're talking about DynamoDB. Like DynamoDB, yeah, okay, let's say you can only read DynamoDB after you write to three replicas. Like let's say that's the case. You could do the same with blockchains. You could say you've got blockchain infrastructure as long as you can successfully write to N replicas, let's say five replicas, 10 replicas, instead of the entire chain. You could say, "Okay, we're going to write to five replicas. And as soon as you write to five replicas, you can read that transaction. That would be fine. They'll be absolutely fine.

[01:14:32] ND: Yeah, it would be if they're centralized and you don't have a million of them, right?

[01:14:36] JM: No. Even if there's a million of them, you could build in rollback systems. You could say, "Okay, like if I can successfully write to five nodes in –" Let's say you got a set of

nodes, write to five random nodes. If all of them except the transaction, then you can now read from those nodes. And then, let's say, every time you want to reach out to the most up to date blockchain, you hit some like node index, and then the end index tells you what are the most up to date nodes. And then you just read from one of those up to date nodes. It's going to be one of those five nodes that have been updated. So that's just a simple idea. Like I don't even know if that works for sure. All I'm saying is that we're so far away from where we need to be to actually have this stuff hit production a meaningful way. We're basically at whitepaper zone. We're gambling on white papers. We've been gambling on white papers for 13 years. It's kind of ghastly. I don't know. I want to see people build this stuff in cloud infrastructure.

[01:15:28] ND: Yeah, for sure. I mean, I would say like look into Celo. Look into – I'm going to personally into Celo more.

[01:15:35] JM: I think Prene works at Celo now.

[01:15:37] ND: Oh, I'm not sure. I know that Eric Nakagawa from Facebook went there a few weeks ago, a few months ago. And then there's also – Checkout Solana. I'm going to personally look into both of those a little more, because now you've piqued my interest around what is possible and like what are the more interesting scaling solutions that are out there and where we want to be? And of course, what are the projects that are actually solving some real world use cases? I look forward to seeing the stuff that you're working on. That sounds really, really interesting and really cool.

[01:16:07] JM: Yeah. Did you see the post I wrote? This is the last thing? Did you see the post I wrote called Cloud Blockchains?

[01:16:12] ND: Nope I need to check it out.

[01:16:14] JM: Just search Cloud Blockchains Rectangle, or you can look at my grotesque Twitter history. I got to get going, man. Send me your itinerary. I'll try to meet –

[01:16:22] ND: Okay, I'll send it over.

[01:16:22] JM: Okay. Talk to you, my friend.

[01:16:24] ND: See you later. Thanks for having me on again.

[01:16:25] JM: Okay. All right, bye.

[01:16:26] ND: Bye.

[END]