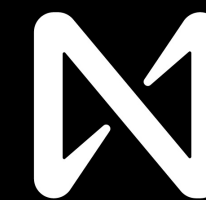


NEAR METaverse MAGAZINE



NEAR

N. 5 2022

APRIL EDITION

How do we see the internet?

NFTs, scarcity and the art market

What is Sharding?

MEET CLARIAN NORTH!

COOLEST NEAR NFT MINTS

WHO IS WHO IN METaverse DAO



BECOPRO

Becopro is a multi artist, graffiti artist and video editor. He has been working as a metaverse reporter for the Metaverse DAO, going to the metaverse events and recording them to be kept as a historical record of the NEAR Protocol metaverse presence.

BeetleJuice is Brazilian, a designer and an artist. She works with 3D art, visual communication and editorial design. Beside this, she works with education, games, service design and projects.

BEETLEJUICE



KLARA KOPI

Klara Kopi is a multi artist, a generalist artist in her words. She uses from watercolors to 3D modeling in her creations. She has been working for the Metaverse DAO as an interviewer, talking to members of NEAR Protocol community with a regular metaverse presence.

WHAT IS IN THIS NUMBER

WHO IS WHO IN METaverse DAO

NEAR METaverse EVENT OF THE MONTH

EVENTS OF MARCH 2022

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COOLEST NEAR NFT MINTS

NEAR METaverse MUSICAL ARTIST OF THE MONTH #1

NEAR METaverse MUSICAL ARTIST OF THE MONTH #2

THE METaverse IS CHANGING THE WAY WE SEE THE INTERNET

NFTS, SCARCITY, AND THE ART MARKET

THE BASICS OF SHARDING TECHNOLOGY

NEAR METAVERSE EVENT OF THE MONTH

Musician: Charlie Mancini

Recording and Video Production: BeCoPro

Producer: mutiDAO

DAO: mutiDAO

Location: mutiDAO-amphitheater on NEAR Hub



[CLICK HERE TO SEE THE MINTED VIDEO](#)

MUTI.ON FEAT CHARLIE MANCINI – APR 21ST, 2022

About the event:

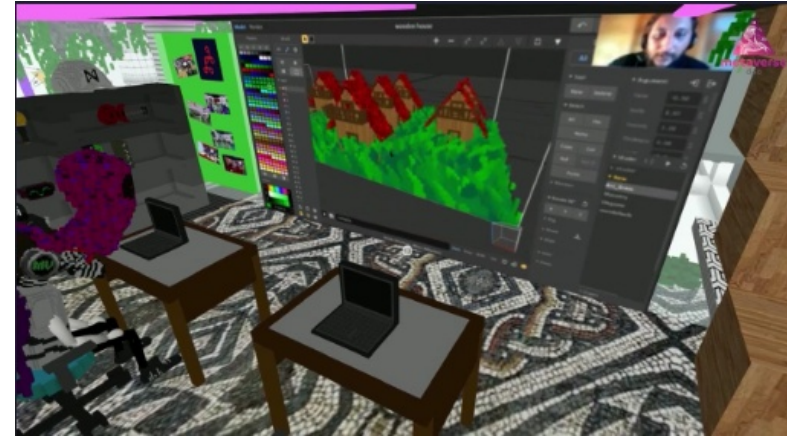
This muti event is very cool, every one of them has autoral music from great artists and the space has a gallery with very diverse visual arts.

This mutiDAO space is on NEAR Hub that is a metaverse being built on NEAR for the NEAR DAOs and community.

Tabea is one of the founders of muti DAO and is always present on the events and very welcoming. On this event we even had a dancing croissant lol The event and the space reflect very well muti's spirit, come and have a great experience in this amazing nature like space.



EVENTS OF MARCH 2022



01 - Magica Voxel Workshop with Gus Manute and Nomade Label for Near Metaverse DAO - 05th Mar, 2022

Rec. and Video Prod.: BeCoPro

Producer: manutegus.near
DAO: Metaverse DAO

Location: NEAR Metaverse
Connection Center

Magica Voxel Workshop with Gus Manute and Nomade Label for Near Metaverse DAO PART 1.

Magica Voxel Workshop with Gus Manute and Nomade Label for Near Metaverse DAO PART 2.



02 -Tamago Island Music Event - Mar 04th, 2022

Musician U.N.I

3D Art by Dean Yaeger, based off original build by Orztirr Studio

Rec. and Video Prod.: BeCoPro

Producer: Tamago

Location:
Tama Island on Near Hub



03 - My Gaia/Mom Art Exhibition + Party by Ina DAO - Mar 08th, 2022

Musician: kintamani

Rec. and Video Prod.: BeCoPro

Production: INA Dao
DAO: INA Dao

Location: INA DAO GALLERY

**YOU CAN CLICK IN THE
IMAGE, THE NAME OF THE
EVENT, LOCATION AND
MORE TO BE TELEPORTED**



04 - My Gaia/Mom Art Exhibition - Mar 08th, 2022

Rec. and Video Prod.: BeCoPro

Production: INA Dao

DAO: INA Dao

Location: INA DAO GALLERY
NEAR HUB

05 - Open Mic on Tama Island - Mar 08th, 2022

Rec. and Video Prod.: BeCoPro

3D Art by Dean Yaeger, based off
original build by Orztirr Studio

Producer: Tamago

Location:
Tama Island on Near Hub



06 - Feminu - Mar 08th, 2022

Rec. and Video Prod.: BeCoPro

Producer: Ghini

DAO: Gambiarra DAO

Location: Museu.XYZ

07 - StrictlyBallein by DJ DAO featuring ONIICHAN - Mar 9th, 2022

Musician: Oniichan

Rec. and Video Prod.: BeCoPro

Producer: Netuno / netuno.near

DAO: djDAO

Location: Playground





08 - The Rare Vandal - Listening Party - Mar 9th, 2022

Musician: Vandal

Rec. and Video Prod.: BeCoPro

Producer : VanDAO

DAOs: VANDAO, RECORDS DAO, METaverse DAO and BEAT DAO

Location: DAOrecords HQ

09 - "EXIT LIQUIDITY" Art Installation by Zeitwarp - Mar 10th, 2022

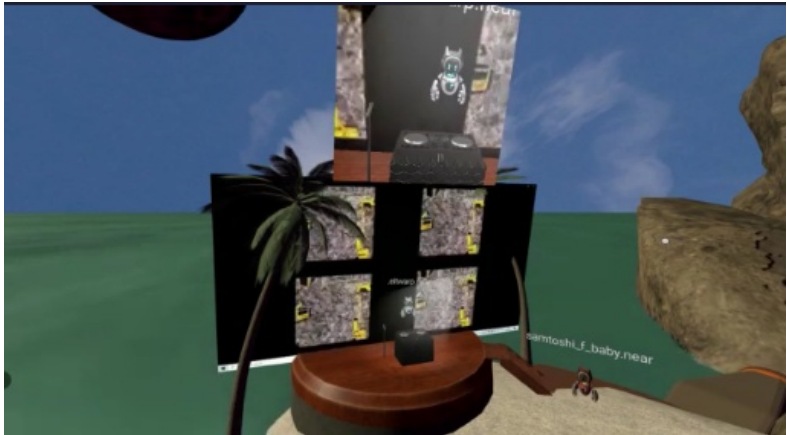
Rec. and Video Prod.: BeCoPro

3D Art by Dean Yaeger, based off original build by Orztirr Studio

Artist / Producer: zeitwarp.near

Promoter/ DAO: Tamago

Location: Tama Island



10 - Tamago Island Music Event - Mar 11th, 2022

Musician: U.N.I

3D Art by Dean Yaeger, based off original build by Orztirr Studio

Rec. and Video Prod.: BeCoPro

Producer: Tamago

Location:
Tama Island on Near Hub

11 - Tamago Open Mic on Tama Island - Mar 15th, 2022

Open mic presentation.

3D Art by Dean Yaeger, based off original build by Orztirr Studio

Rec. and Video Prod.: BeCoPro

Producer: Tamago

Location:
Tama Island on Near Hub



**12 - StrictlyBallein by DJ DAO
featuring Mythic Creature -
Mar 16th, 2022**

Musician: Mythic Creature / .near

Rec. and Video Prod.: BeCoPro

Producer: Netuno / netuno.near
DAO: djDAO

Location: Playground



**13 - Women's Exhibitions +
Party - Mar 16th, 2022**

Opening party hosting DJ Numa
Opening of the "4 Women
Exhibition" with artists
@prislocollage, @ca.venaghi,
@natashacremonese_ and
@ghin_ar
Opening the "My body's dialogue
exhibition" by Bianca Victal
Musician: DJ Numa

Rec. and Video Prod.: BeCoPro

Producer: Isadanoninho
Curator: Isadanoninho and
Alexandre Macieira

DAO: Metaverse DAO
Location: NEAR Metaverse
Connection Center

**14 - muti.on feat Tempura -
Mar 17th, 2022**

Musician: Tempura

Rec. and Video Prod.: BeCoPro

Producer: mutiDAO
DAO: mutiDAO

Location: mutiDAO-amphitheater
on NEAR Hub



**15 - Expokids Gambiarra - Mar
18th, 2022**

Rec. and Video Prod.: BeCoPro

Producer: Natasha Cremonese e
Carlos Roberto Escouto

DAO: Gambiarra DAO

Location: Gambiarra DAO Gallery



16 - Tama Island Gatherings feat U.N.I - Mar 18th, 2022

Musician: U.N.I

Rec. and Video Prod.: BeCoPro

Producer: Tama Island DAO

DAO: Tama Island DAO

Location: Tama Island on Near
Hub

17 - Metatronic feat Micha - Mar 20th, 2022

Musician: Micha

Rec. and Video Prod.: BeCoPro

Producer: Isadanoninho

DAO: MetaverseDAO

Location: NEAR Metaverse
Connection Center



18 - Open Mic on Tama Island - Mar 22th, 2022

Musician:

Rec. and Video Prod.: BeCoPro

Producer: Tama Island DAO

DAO: Tama Island DAO

Location: Tama Island on Near
Hub



19 - Crossroad Event #1 by Spiritual DAO - Mar 22th, 2022

Karma Podcast EP #1 release.
The event revealed the Bounty
Show your Soul #1 winners.

Rec. and Video Prod.: BeCoPro

Producer: manutegus
DAO: Spiritual DAO

Location: Spiritual DAO - NEAR



**20 - StrictlyBallein by djDAO
feat Glazed- Mar 23th, 2022**

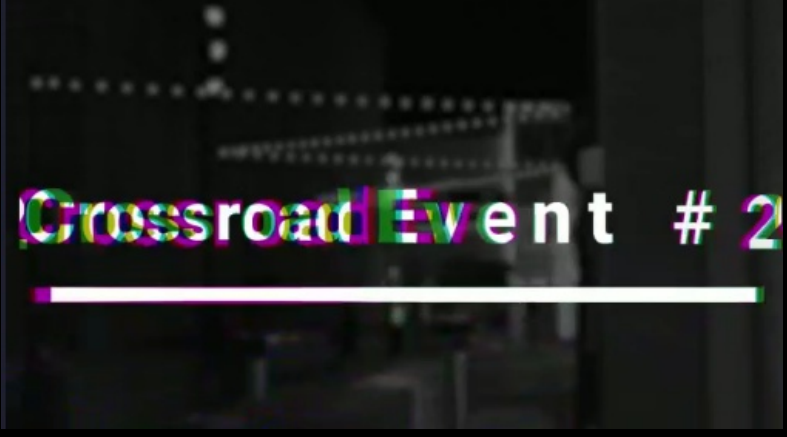
Musician: Glazed

Rec. and Video Prod.: BeCoPro

Producer: Netuno

DAO: djDAO

Location: The Playground



**22 - Crossroad Event #2 by
Spiritual DAO - Mar 24th, 2022**

Karma Podcast ep#2 release.
The event revealed the Bounty
Show your Soul #2 winners!

Rec. and Video Prod.: BeCoPro

Producer: manutegus

DAO: Spiritual DAO

Location: Spiritual DAO - NEAR

**21 - muti.on feat N△N▽ - Mar
24th, 2022**

Musician: N△N▽ / ntriangulo.near

Rec. and Video Prod.: BeCoPro

Producer: Mãe Solteira Records

DAO: mutiDAO

Location: mutiDAO Amphitheater
on NEAR Hub



**23 -Tama Island Gatherings
feat U.N.I - Mar 25th, 2022**

Musician: U.N.I

Rec. and Video Prod.: BeCoPro

Producer:Tama Island DAO

DAO:Tama Island DAO

Location:Tama Island on Near
Hub



ECOSYSTEM PERSONALITY

CLARIAN NORTH

Klara Kopi

Hi. Welcome to Meta Interviews with Klara Kopi. Today I'm here with Clarian, one of the co-creators of Tamago. We're going to have a lot of fun in this interview.

[...]

Klara Kopi

So, let's start. So first things first. Please tell us a bit about your background. Why did you come from remarkable events in your life, your career choices, anything you feel that led you to where you are today?

Clarian North

That's quite a loaded question, Klara.

Klara Kopi

Oh, sorry, I can break it up. Where did you come from, your background. Tell us what you're used to tell people. Feel comfortable. (laughs)

Clarian North

I'm from well, I you know, I was born in outer space with a monkey in my face, and I. Haha no, that those are lyrics to a song.

So I I'm from Canada, from Montreal, in Canada, and then I also grew up in New York, so. Yeah, so I have kind of like a Canada and in the United States back and forth when I was a kid.

Clarian North

And then when I was about 20 or 21 years old, I started traveling for a living, working at studios, working for artists, working at festivals lot of stuff and music and did that kind of stuff for a while. So I did that for about 12 years and I lived in a lot of different places. You know, I lived in Berlin, Chicago, L.A. I was and spent a lot of time living in Mexico and then traveling south to South America, going in Asia, all the continents that I was very lucky, fortunate to spend those years traveling. And because of that, I never really identified, like I kind of lost the plot in terms of like what's my, how do I feel like my identification of where I come from because I was so much more focused. I've always been more focused on what I'm where I am and where I'm going has always been more interesting to me than where I'm from. If that makes sense.

Klara Kopi

So, yeah, Totally. That seems like awesome. It must be like a dream traveling all this time and meeting all these different cultures and... did it have an effect on your production as a musician?

Clarian North

Yeah, definitely. Yeah. It's, it is very, to be able to travel is amazing to live today in a time where we can travel to different cultures because I do like to think about it like compared to the Middle Ages or compared to, you know, times where if you wanted to go from A to B, it could take you a long time, you know, on a boat, even the industrial revolution, like with airplanes, you can fly. Of course, now we're much more conscientious about how we spend our emissions, right, when we travel. but even barring, barring traveling, the ability for us to connect right now on a Zoom meeting that you're in Brazil, and I'm in New York, that's already really that's traveling like we are traveling. Yeah, we're traveling right now. That's why the metaverse is so exciting and interesting.

Clarian North

And so I would just say overall, I would kind of put it like the, to live in a time where interconnectivity is prevalent and accessible for people that has a huge influence on my feeling of what people are like, what cultures are like. And then in turn because it opens my eyes to different types of ways of living, different types of people out there, such as yourself. And then in turn, that also then affects my overall outlook on what it is to be alive, to exist on this planet. With other people, to share the space, and then how I make music or how I work or make technology or whatever I do it, It has an impact because then it makes me more conscientious, more aware of this planet, which otherwise I think, you know, I, you know, I'm in my early thirties, but you know, when I was a kid, there was no Internet for a while. And that's a weird concept. Imagine, no Internet.

Klara Kopi

Yeah, I'm 35.



[CLICK HERE TO SEE THE FULL INTERVIEW](#)

This text is a part of the
video interview transcript.
Watch the full interview on
Youtube.



Clarian North

Ok, you know what I'm talking about. Im laughing like imagine for a kid today that's ten years old, it'd be like, what? Or you just imagine now, imagine if somebody came up to you right now and said, there's no Internet it's gone. Like, it's gone, like, oh, like what's going to happen? Right. But yeah, so but like that, I guess the dichotomy there is sort of interesting because then, you know, I do have the juxtaposition of thinking to myself if I wanted to know what like somebody in France is doing, I'd have to write a letter, you know, or like you watch something on television which is very much catered to, you know, give you a message that's going to be in a specific frame. But the ability to have a zoom call, that's a game changer because then that really does, you know, things like that streaming. So yeah, you know, it's it definitely plays a major factor, I think, for me in terms of my outlook and like the way I see the world, you know, the way I see the world.

Klara Kopi

Awesome. Very deep and deep thoughts.

Clarian North

Hahaha deep thoughts. I think that's because it's like Wednesday afternoon is you caught me during Deep Mode, Deep Wednesdays.

Klara Kopi

I like it, I love it. I love having deep conversations. It makes us think, well but[...]

Clarian North

But it's a facade because like, it's only it's only for an hour on Wednesdays that I get into deep mode to make up for like the other six days where it's all surface, all surface thoughts.

COOLEST NEAR NFT MINTS

MINTBASE



Artist: stoyan
Name: Orchid flowers

Artist: loam.near
Name: Good Boy





Artist: lauryish.near
Name: Carnival Costume

Artist: mm990225.near
Name: Crypto Alpaca 002





Artist: dddani100n.near

Name: splash



Artist: interwebdynamics.near

Name: Mind



Artist: Peso. near


Name: Near Wallet Double

[← Back](#)

[Detail / Card](#)

SERIES // Edition of 1000

"ZOM31E 1,000 EDITION "

by [cookieez31.near](#) 

[Info](#) [Owners](#) [Offers](#) [History](#) [Publication](#)

Description
 "ZOM31E NEAR 1,000 EDITION "
 This project's name is "ZOM31E, from the word "ZOMBIE".
 These zombies are unique, 1/1 edition, let's create and join the ZOM31E gang.

RARITY
 COMMON ★

[Check Owners](#) [Place an offer](#)




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[Detail / Card](#)

SERIES // Edition of 200

DAISIES x CRYPTOMOON

by [babi_daisiesdaydreams.near](#) 

[Info](#) [Owners](#) [Offers](#) [History](#) [Publication](#)

Description
 Daisies will raid the Cryptomoon party on Apr 30-May 1 !!!!

 These are souvenir cards and part of 'Daisy: It's okay' project.
 Everything is okay!
 You can deal with it. Keep fighting!

[Buy for 0.1 ₪](#) [Place an offer](#)



[← Back](#)

Detail / Card

SERIES // Edition of 2

Divine Wolf #22

by warrenigente.near

[Info](#) [Owners](#) [Offers](#) [History](#) [Publication](#)

Description
Divine Wolf Club is manually hand drawn collection that helps you to smile with it's cute smile, Each wolf has its own unique fashion statement, styles and has different sets of shirt ,mask, caps etc.

Collection
DIVINE WOLF CLUB

Buy for 0.5 ₳

Place an offer



[← Back](#)

Detail / Card

SERIES // Edition of 350

FREE Promotion Card

by ismart_illus.near

[Info](#) [Owners](#) [Offers](#) [History](#) [Publication](#)

Description
A collection of pickel multiverse, involving different art style and concepts. Each art style has a unique characteristics.

Collection
Pickel Multiverse

[Check Owners](#)

Place an offer



← Back

Detail / Card

NFT // #1 of 1

...



AGEN HEAD 186 #1

by planktoncgc.near

[Info](#) [Owners](#) [Offers](#) [History](#) [Publication](#)

Description

show your deep with the helmet suit

Owner

kom1n.near

Collection

Buy for 10 ₪

Place an offer

See token series

← Back

Detail / Card

SERIES // Edition of 600

...



Near Space Sushi #24

by lootre.near

[Info](#) [Owners](#) [Offers](#) [History](#) [Publication](#)

Description

Mermaid Miso upset with the pile of dishes she needs to do.

Collection

Near Space Sushi

Royalty

10% 🔄

Copies

600

Views

👁️ 024

Check Owners

Place an offer

← Back

Detail / Card



NFT // #1 of 1

...

Doong Blueberry Lemon Glasses #003 #1

by artmorita.near 

Info Owners Offers History Publication

Description

Rare

DoongDoong in a Blueberry Lemon Glass

Owner

6341ee0193ce6e9...6a32b1cf6716182

Buy for 4.5 ₳

Place an offer

See token series

NEAR METAVERSE MUSICAL ARTIST OF THE MONTH #1

RARE VANDAL

Klara Kopi

Hi, everyone. Welcome to Meta Interviews with Klara Kopi. Today I'm here with Vandal, Rare Vandal, the founder of the VanDAO and DAO Records. Hi, Vandal. How are you?

[...]

Klara Kopi

It's a lot of fun. Yeah, it's funny. It is. I'm still getting used to talking to people all over the world. And considering the time changes. Like, yeah, I'm in the middle of the, start of the night. I know. And you're in the morning.

Rare Vandal

Yeah. It's interesting, because one of one of my friends from Metaverse Radio, they they decided to do the Metaverse Cyber Time. So it's it's a time zone specifically for people who live in the metaverse. So we can all coordinate our timing. It hasn't quite taken off yet, but I think it does have potential because of these. These differences, right. We can go, okay, let's we're in this time in a cyber time, I think.

Klara Kopi

Yeah. That's awesome. I'd like to know more about it, actually. Cyber time, what a concept, exciting. Yeah, because with the Internet, everyone is connected. It's awesome.

Rare Vandal

Yeah. And it's true. Time zones are the most challenging thing to navigate with within this web three space and the metaverse space, and especially, well, I hear they're doing away with it, but the daylight savings was like a real pain in the butt because, you know, in Europe, it moved back later than in North America. So you have this gap of like almost one month where in America they're already like they've, you know, moved the clocks ahead and then Europe, they hadn't moved them have yet.

So let's just this whole complicated mess with daylight savings I, I hope they just get rid of daylight savings. I don't think we need it.

Klara Kopi

Here in Brazil, they got away with that. We really don't have it anymore. So it's less confusing.



This text is a part of the
video interview transcript.
Watch the full interview on
Youtube.

CLICK HERE TO SEE THE FULL INTERVIEW

Rare Vandal
Yeah.

Klara Kopi

Well, so let's start by the beginning. Tell us a bit about your background. Where did you come from? You used to have another career before or anything you think is relevant about your story and led you here today?

Rare Vandal

Sure. Well, I was born and raised in Toronto, Canada. My mum was a huge influence on a lot of the things I did as a kid, whether or not I had a choice. So some of those things were like traveling. And we traveled to South America, to Colombia, to Central America. Like Mexico, Guatemala, to East Africa, all across backpacking, all like before I went to high school and then once I got to high school, when I graduated, I had caught the travel bug myself and ended up starting my own sort of global adventures.

Rare Vandal

And along with that, I kind of fell in love with hip hop. At the end of this, it was around 1989 I would say like fully 89/90, and I started to really kind of get into it. I had written poetry as a kid I was into, into like short stories and just sort of being, being creative with, with words and, and, you know, that kind of extended to form, I guess the basis of the, the last 30 years of my life, which was, you know, becoming a hip hop MC and producer, traveling to different parts of the world, collaborating with people and eventually, you know, that found me in Malaysia the beginning of 2020, where I ended up having like a number one hit on the Malaysian radio and you know, quite a bit of success over there.

NEAR METAVERSE MUSICAL ARTIST OF THE MONTH #2

ELECTROBRO

Klara Kopi

Hi, everyone. Welcome to Meta Interview with Klara Kopi. Today I'm here with Electrobros. He's a member of the djDAO and co event coordinator.

[...]

Klara Kopi

So let us know a bit about you. You're past what you used to do. What led you here? What do you feel it's important for us to know about you.

Electrobros

So let's see. I have been making music or singing or playing an instrument since I was a kid. I don't know, maybe like five or six years old. I've been in bands and courses all throughout my life. I recorded my high school band album in high school, two of them actually. And yeah, I just continued working with recording and electronic music eventually.

Electrobros

And in 2009 I found Ableton Live and that changed everything. Ableton just unlocked so many creative pathways for me, so I became obsessed with it immediately. It never left it as a software. In 2010, I came up with Electrobros and I've been

doing that since. And then in 2012 I started Sine Wave Surfers, which is an artist collective and a record label.

Electrobros

Dedicated to expanding consciousness, spreading love and empowering people. And you know, the cool thing about putting time into something is you get better at it and it grows. And that's, that's really what's happened. You know, we started as like we started as a Facebook group um, yeah, that's how I initially came up with the framework for it was just like adding people to a Facebook group and then sharing relevant links and resources that helped me out as a music maker.

Electrobros

And then we started doing shows, then we started doing compilation albums and workshops, and it just kind of got bigger and then started turning into something. And here we are doing doing shows almost monthly now all over the place. And we've got releases from artists all over the place as well. So it's cool. Really stoked to be working with NEAR and just web three in general.

Electrobros

I think it's a really interesting space and how we use it right now really determines how it'll be used in the future. So yeah,

I'm really just interested in learning as much as I can about everything and seeing what the heck happens. Yeah.

Klara Kopi

It's a great place. So Sine Wave Surfers is ah, well is making ten years now.

Electrobro

Yeah, yeah. Well, I noticed that the other day everyone's like "Wow, ten years old we're doing this."

Klara Kopi

Awesome. ten year anniversary. Congratulations.

Electrobro

Thank you. Yeah, May 5th 2012 was the official founding date when I made the Facebook group.

Klara Kopi

Next month, around the corner. Awesome. Congratulations. It's very good to see a project well, making so much time that it takes a long time to develop. And it's great to know that you are together all the time, growing and developing and becoming something else. Not something else. But yeah. Bigger.

Electrobro

Yeah.

Klara Kopi

Yeah. Like different branches and now making shows every week almost in the metaverse also.



This text is a part of the video interview transcript. Watch the full interview on Youtube.

[CLICK HERE TO SEE THE FULL INTERVIEW](#)

THE METAVERSE IS CHANGING THE WAY WE SEE THE INTERNET

BY: TROJANHORSE15

Evolution is inevitable; everything in the world will and must evolve from human beings to technology, how we live our daily lives and how we interact with our environment both physically and digitally. This fact has led to the creation of the Metaverse, a universe beyond the physical with immense possibilities we haven't even begun to unravel.

THE METAVERSE

What is the Metaverse? The Metaverse is a 3D digital and virtual reality universe. Users with Avatars can interact, play games and experience a different world where the sky is not the limit because it doesn't exist, but anything can.

The Metaverse is especially popular in the crypto space because it seeks to push the concept of web3 and decentralisation to create a new way to allow people to learn, play and interact on the internet.

By utilising blockchain technology (the building block of cryptocurrency), The Metaverse is already becoming a reality with crypto projects like Decentraland, Sandbox, Axie Infinity and Pegaxy launching their Metaverse.

Most projects have focused on creating Metaverse Games or have established a Metaverse Game already. Metaverse Games have become increasingly popular, and they are not

just gaming platforms but a community where users can interact and even earn cryptocurrency.

Here are three popular Metaverse Games to look out for.

1. Axie Infinity: Axie Infinity is a Metaverse game where user players collect virtual pets (Axies) in the form of NFTs and use them to play the in-game adventure mode or battle against other players. You can also manage and breed Axies to sell as NFTs.

2. Decentraland: Decentraland is a digital world where you can create Avatars and interact by buying NFT wearables, attending in-game concerts, exhibitions, and acquiring virtual land and real estate.

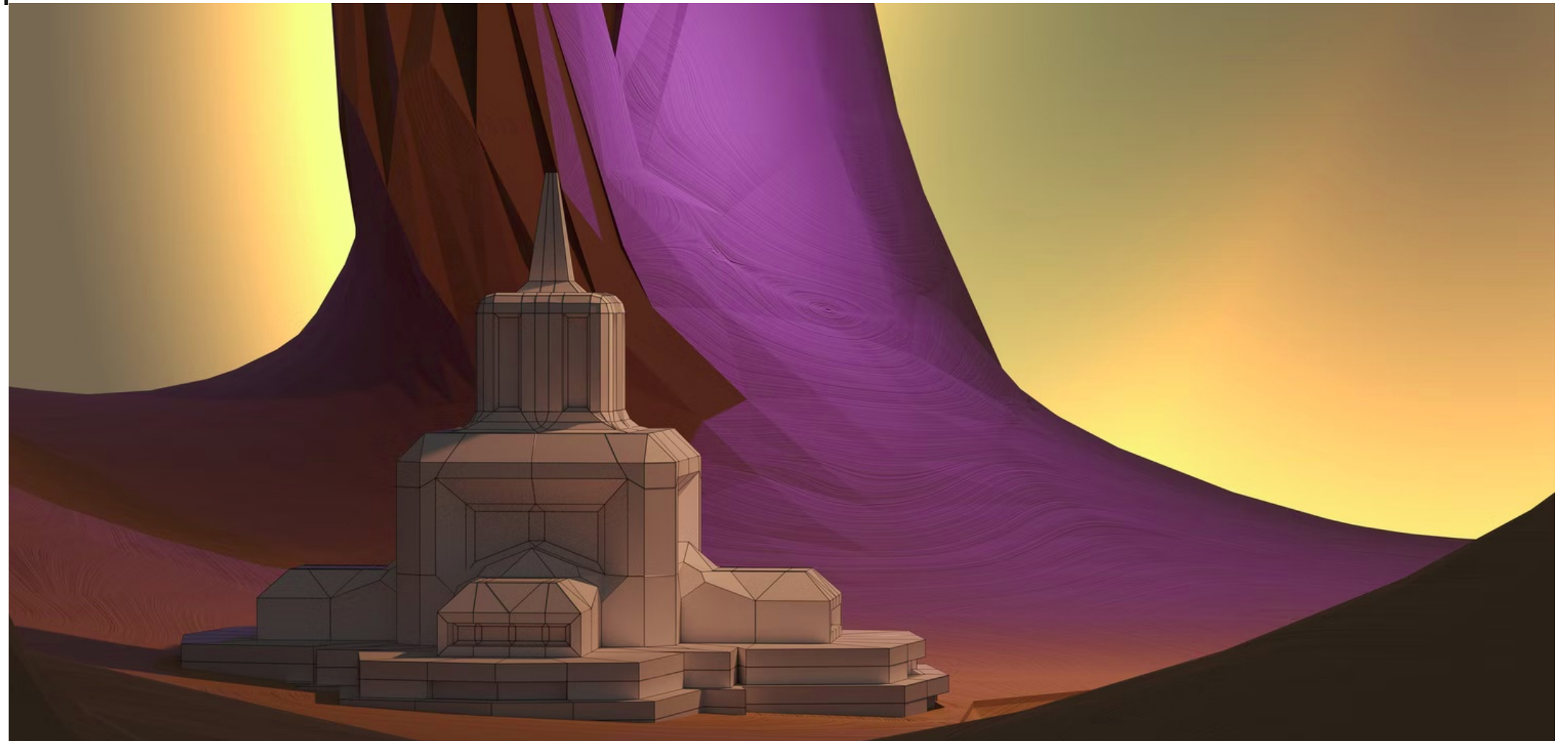
3. Pegaxy: Pegaxy is a digital horse racing game where players play against each other by participating in PvP races. The winners of the races are rewarded with cryptocurrency for winning.

The growth of the Metaverse poses the question of what blockchain network is most suitable for the metaverse? Although many blockchain networks are focusing on the

metaverse and merging it with their functionalities, Near Protocol stands out.

Near Protocol has prized itself at being at the forefront of creating a space for crypto projects exploring various crypto trends from DeFi to NFTs and now the Metaverse to thrive. The idea of a Metaverse is appealing to Near Protocol. In its hackathon, last year, Near Protocol was focused on the metaverse and creating use cases for the evolution of the internet into the metaverse; with its many dApps (Decentralised Applications using smart contracts), it is providing support for people and projects to be creative and flexible with this new and growing technology.

The metaverse is evolving the internet, changing our perspective on how we play games, connect and interact with our digital world. This digital world is just beyond the horizon, I hope you are ready for it.



NFTS, SCARCITY, AND THE ART MARKET

BY MARIANA HARTENTHAL

One of the main arguments against the legitimacy of NFTs is its supposedly gratuitous commercialism. Critics argue that blockchain-based art exists only for opportunists to make a buck out of disingenuous (or foolish) collectors expecting to make a profit from it in the secondary art market. We cannot deny that speculation and a sometimes-unfounded excitement with everything crypto is part of the nascent NFT ecosystem. Yet, the accusation of vapid commercialism ignores an important aspect of the art world: even the most traditional visual artforms are entangled with the market, at least in Western societies, and at least since the end of the Middle Ages. As art historian Michael Baxandall insisted in his influential study of 15th-century painting, “money is very important in the history of art.” In his study, Baxandall examined the shift from medieval to Early Modern perceptions of artistic valuation, when the price of paintings stopped being based on the amount of gold or blue pigment employed and started to reflect the skill of the artist, a mindset that still informs how art is consumed and created. Baxandall demonstrates that market forces, and the social relationships enmeshed in it, should not be dismissed as frivolous or superficial when talking about art. Only those unfamiliar with art history, or with the current art world, can pretend to believe that art exists in a pure context of innocent delight untouched by the evils of capital. Rather, artistic production, circulation,

and consumption takes place in a network of individuals – the artists themselves, curators, critics, historians – and organizations such as galleries, associations, and museums of different sizes and structures, that all need to make money. However, until the advent of NFTs, the market for digital art faced a major obstacle: since content online flows so freely, there was neither scarcity nor reliable ways to prove ownership and therefore, digital artworks had little (financial) value. NFTs shift this paradigm by enabling digital artworks to become verifiably scarce and unique. To those bothered with this artificially imposed scarcity, it’s worth reminding that the practice is nothing new. Photography went through a similar process of having to prove it is a “serious art,” something that only happened in the early 20th century, decades after the invention of the medium around 1839. At that time, photography also was considered too easy to create – “machine-made” – and too easy to distribute, compared to painting. Even nowadays, artificial scarcity is necessary to frame the trading of photographs. For



example, the Henri-Cartier Bresson Foundation has a notice on its website warning that all the prints made by the famous photographer that are marked with a “Magnum Photos” stamp are not “intended for collections” (Prints - Fondation Henri Cartier-Bresson). Bear in mind that the Foundation doesn’t suggest that these images are fake, not made by Cartier-Bresson. Still, they affirm that only those explicitly signed and dedicated by him (and certified by the Foundation) are collectible material. Reproducible art needs such mechanisms to assure market value and indeed, photography today is not only collected and exhibited by major museums and researched at universities as it generates profit that sustain a network of individuals and organizations. Considering that computer-based art exists since the 1960s, it’s about time for digital art to have its own thriving market.

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THE BASICS OF SHARDING TECHNOLOGY

BY M.PHIL

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What is Sharding?

While working for an auction website, somebody got the idea to solve the site's scaling problems by creating a database server for a group of users and running those servers on cheap Linux boxes. In this scheme the data for User A is stored on one server and data for User B is stored on another server. It's a federated model. Groups of 500k users are stored together in what are called shards.

Simply, a shard (database shard), is a horizontal partition of data in a database or search engine. Each shard is held on a separate database server instance, to spread load.

Sharding involves splitting and distributing one logical data set across multiple databases that share nothing and can be deployed across multiple servers. To achieve sharding, the rows or columns of a larger database table are split into multiple smaller tables.

Once a logical shard is stored on another node, it is known as a physical shard. One physical shard can hold multiple logical shards. The shards are autonomous and don't share the same data or computing resources. That's why they exemplify a shared-nothing architecture. At the same time, the data in all the shards represents a logical data set.

Horizontal and Vertical Sharding

Sharding can either be horizontal or vertical:

Horizontal sharding : When each new table has the same schema but unique rows, it is known as horizontal sharding. In this type of sharding, more machines are added to an existing stack to spread out the load, increase processing speed and support more traffic. This method is most effective when queries return a subset of rows that are often grouped together.

Vertical Sharding : When each new table has a schema that is a faithful subset of the original table's schema, it is known as vertical sharding. It is effective when queries usually return only a subset of columns of the data.

Differences between Sharding and Partitioning

Although sharding and partitioning both break up a large database into smaller databases, there is a difference between the two methods.

After a database is sharded, the data in the new table is spread across multiple systems, but with partitioning, that is not the case. Partitioning groups data subsets within a single database instance.

Types of Sharding Architectures

Key-based sharding

In key-based sharding, which is also known as hash-based sharding, the data is plugged into a hash function to determine which shard each data value must go to.

A hash function takes a piece of input data and generates a discrete output value known as the hash value. In key-based sharding, the hash value is the shard ID, which determines in which shard the data is stored. The values entered into the hash function all come from the same column, known as the shard key, to ensure that entries are placed consistently and with the appropriate accompanying data in the correct shards. This key is static. i.e. its values don't change over time. If they do, it could slow down performance.

Range-based sharding

As the name suggests, range-based sharding involves sharding data according to the ranges of a given value. The range is based on a field which is known as the shard key.

Directory-based sharding

In directory-based sharding, a lookup table is created and maintained. It uses a shard key to track which shard holds what kind of data.

Advantages and Disadvantages of Sharding

The **advantages** of sharding are;

High availability; If one box goes down the others still operate.

Faster queries; Smaller amounts of data in each user group mean faster querying.

More write bandwidth; With no master database serializing

writes you can write in parallel which increases your write throughput. Writing is major bottleneck for many websites. You can do more work; A parallel backend means you can do more work simultaneously. You can handle higher user loads, especially when writing data, because there are parallel paths through your system. You can load balance web servers, which access shards over different network paths, which are processed by separate CPUs, which use separate caches of RAM and separate disk IO paths to process work. Very few bottlenecks limit your work.

Disadvantages

Sharding a database table before it has been optimized locally causes premature complexity. Sharding should be used only when all other options for optimization are inadequate. The introduced complexity of database sharding causes the following potential problems:

SQL complexity - Increased bugs because the developers have to write more complicated SQL to handle sharding logic

Additional software - that partitions, balances, coordinates, and ensures integrity can fail

Single point of failure - Corruption of one shard due to network/hardware/systems problems causes failure of the entire table.

Fail-over server complexity - Fail-over servers must have copies of the fleets of database shards.

Backups complexity - Database backups of the individual shards must be coordinated with the backups of the other shards.

Operational complexity - Adding/removing indexes, adding/deleting columns, modifying the schema becomes much more difficult.

These historical complications of do-it-yourself sharding were addressed by independent software vendors who provided automatic sharding.

How is Sharding different from Traditional Architectures?

Sharding is different than traditional database architecture in several important ways; following are the important key factors: Data is denormalized; Traditionally we normalize data. Data are splayed out into anomaly-less tables and then joined back together again when they need to be used. In sharding the data are denormalized. You store data that are used together. This doesn't mean you don't also segregate data by type. You can keep a user's profile data separate from their comments, blogs, email, media, etc, but the user profile data would be stored and retrieved as a whole. This is a very fast approach. You just get a blob and store a blob. No joins are needed and it can be written with one disk write.

Data is across many physical instances; Historically database servers are scaled up. You buy bigger machines to get more power. With sharding the data are parallelized and you scale by scaling out. Using this approach you can get massively more work done because it can be done in parallel.

Data is small; The larger a set of data a server handles the harder it is to cash intelligently because you have such a wide diversity of data being accessed. You need huge gobs of RAM that may not even be enough to cache the data when you need it. By isolating data into smaller shards the data you are accessing is more likely to stay in cache.

Smaller sets of data are also easier to backup, restore and manage. Data are more highly available; Since the shards are independent a failure in one doesn't cause a failure in another. And if you make each shard operate at 50% capacity it's much easier to upgrade a shard in place. Keeping multitude data copies within a shard also helps with redundancy and making the data more parallelized so more work can be done on the

data. You can also setup a shard to have a master-slave or dual master relationship within the shard to avoid a single point of failure within the shard. If one server goes down the other can take over.

It doesn't use replication; Replicating data from a master server to slave servers is a traditional approach to scaling.

Data is written to a master server and then replicated to one or more servers. At that point read operations can be handled by the slaves, but all writes happen on the master.

Obviously the master becomes the bottleneck and a single point of failure; and as the load increases the cost of replication increases. Replication costs in CPU, network bandwidth, and disk IO. The slaves fall behind and have stale data. The folks at YouTube had a big problem with replication overhead as they scaled.

Sharding cleanly and elegantly solves the problems with replication.



Traditional Architectures Differences

- Data is denormalized
- Data is across many physical instances
- Data is small
- Data is more readily available
- It doesn't require replication

What are the advantages?

- High availability
- Faster queries
- More write bandwidth
- You can do more work

Current Implementations

Currently, there are a few key projects working on sharding technology, Ethereum being the most notable project (in terms of market cap rankings). As Vitalik Buterin [hinted in a tweet](#) on April 30, 2018, "Sharding is coming". Ethereum released a proof of concept earlier in 2018, and Buterin has noted that the project team has made a lot of progress on developing the technology.

Still, it's unclear just how much sharding would boost the number of possible transactions per second. Although a lot of numbers have been thrown around, Buterin and other blockchain experts have stated that 1 million transactions per second (tps) is very likely.

Examining the market cap rankings, there are also a few other high-ranked projects that are looking to create the foundations

for greater scalability via sharding technology. [Zilliqa](#), for instance, [demonstrated 2,400 tps using 3,600 nodes](#) in its April 2018 testnet release and aims to release its mainnet sometime in Q3 2018.

A successful mainnet launch with a high number of tps could bring more support to the project in the short-term, but it will be even important to see which project can ultimately reach more tps than Visa in the real-world. Even when this milestone is reached, it's still unclear whether Zilliqa, Ethereum, or another project can claim to be the top sharded blockchain in this ongoing competition.

Other Scalability Solutions

It's also worth noting that sharding isn't the only scalability technology that many major projects are aiming to implement. Additionally, a commitment to implementing sharding doesn't mean a rejection of other emerging technologies. For now, it appears that most projects are open to implementing a combination of scalability solutions. For instance, off-chain protocols like [Lightning](#) and [Plasma](#) as well as side-chain protocols like the one proposed by [Loom Network](#) are also a big part of the larger movement towards improvements in throughput efficiency.

In a lot of instances within other tech sectors, the development of newer technologies is highly competitive and developments are rarely disclosed amongst various project teams. However, with blockchain technology, collaboration across the industry has been quite common. If this trend continues, a number of blockchain projects could eventually apply sharding solutions.

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