Blockchain technology is often grouped into being apart of the web 3.0 era. In this lecture I’ll be discussing just what the web 3.0 era actually entails.

So traditionally we are talking about the centralised web that we all know as app developers. In the centralised world, you usually have a server and this server serves the website for example.

There are a number of definitions what the Web 3.0 really is. O’Reilly defines it as the evolution of the rather static Web 2.0, where we have a lot more user generated content. Nova Spivack defines it as a connective intelligence while some other call it the semantic web.

Recently the term web 3.0 was more and more connected with more decentralised services. So, it is safe to say that we can refer to blockchain technologies and decentralised web when we are talking about the Web 3.0.

In the decentralised web there is no more centralised server. In the decentralised web, we have a couple of nodes that interact with each other and replicate the content in a cryptographically secure way.

The centralised servers with our traditional architecture is usually referred to as the Web 2.0. The decentralised way of serving information can also be referred to as the web 3.0.

In the decentralised world there are a number of services that are available. These can range from simple file sharing or message Exchange to complicated Services via a blockchain and smart contracts.

What about the characteristics of the web 2.0 VS 3.0 era?

Well when we are talking about the Web 3.0, then we mostly refer to the decentralised web. In the decentralised web, most services run via a blockchain. Ethereum is one of the biggest blockchains serving so called “dapps” - or distributed applications.

On the blockchain every bit of information is saved in blocks, which cannot be altered afterwards. So, it is a transactional hierarchy of information. Information can only be added. This doesn’t necessarily mean that we can’t delete anything anymore for programs running on top of it, it’s just recorded on the blockchain that it was created first and then deleted again, so it’s obvious to anyone what happened with every bit of information from start to finish.

This is one of the biggest differences between the Web 2.0 and the Web 3.0: Immutability.

When we are talking about the decentralised web, then we mostly talk about distributed applications running on smart contracts. The Ethereum blockchain is the biggest player in the field. But why is Bitcoin so important then if it can’t run any distributed applications? Because with Bitcoin you get one single distributed application, that is value transfer. And this is said to be the biggest competitor to the financial services industry.

If you send remittances today, you pay, on average, around 5% fees using traditional financial services. Sometimes much higher. With bitcoin, using decentralised value transfer in a cryptographically secure way, these fees could be lowered drastically against typical Web 2.0, financial transfers through centralised servers.

But today there are much more possibilities on the decentralised web. From self governing code to decentralised data storages, to all kinds of services on top of it. There is a plethora of new things coming towards us.

Now when did this transition from the web 2.0, and 3.0 era take place?

So we are all very used to our traditional client/server infrastructure. We open a browser and enter an address. In the most simplistic case, our browser will resolve the DNS to an IP address. Then it will connect to the Web-Server behind this IP address and download the HTML Page, CSS and Images. This information is parsed and displayed to the user.

With load balancing and clustered server infrastructures it becomes more complex, but the principle stays the same: A client connects to a server and downloads information.

We have seen distributed information already long time ago with the torrent network. Instead of downloading the information from one server, we suddenly connect to many different sources downloading bits and pieces of information from all around the globe.

The Web 3.0 brings exactly this concept to the next stage and applies advanced cryptographics on top of it.

Now, when you use google, facebook, twitter and so on, you enter your username and your password. This authentication and authorization process is so common that we barely think about it anymore.

With the Web 3.0 you don’t necessarily own a username and a password anymore. You own a private and a public key. The private key creates signatures for every transaction you send off and this can be verified and bound to your account. But that’s not all. You don’t send it to any traditional server anymore. Instead, you could run your own blockchain node on your computer, being your own server and client all in one. The difference is the consensus model. If you want to update information then you have to convince every other node in the whole network that you are allowed to do so.

This works with the private/public key cryptography and complicated mathematical operations you luckily don’t have to know about.

So when it comes to the transition between Web 2.0 and Web 3.0 then we have to re-think how we see the Web. Instead of Client/Server we suddenly see distributed information that can only be changed with the right private key. Everybody is suddenly a server and everybody a client, but only those people with the right private keys can change the information.

This can range from simple text, numbers and booleans, to chat message decryption to file sharing.

It all starts with the transition to mass decentralization of information and private/public key access.

And to really give a zoomed out look of how all this happened, let me go over the past, present & future of the web.

So the Web 1.0. I remember sitting in a bus to school reading the first HTML 4 book. It was so exciting. I could write some code and upload it to a server. Then someone would type in my website address, anywhere on the world, download the website and see what I coded in HTML and a little bit of CSS.

The problem was that nobody could change that information. It is one way only, so a static website.

Obviously, it wasn’t enough at some point and people started to create databases and dynamic websites. Forums, Galleries, Chats. It all required some code on a server to digest the information from other users, store and retrieve it from some database.

The Internet is inherently an unsafe place. We saw it with E-Commerce. You might remember those horror stories where someone would order a laptop and received bricks instead. This led to the rise of Intermediaries, such as PayPal with buyer protection and so on. We constantly tried to make the Internet “a safe place”.

With so much dynamic content, and an ever growing web which becomes faster and faster every day, we started to get search engines to make sense of all this information. The Web 2.0 was born. An interactive place where everyone could participate.

The Web 3.0 aims much more at security, privacy, trust and transparency. It aims to remove the necessity for such intermediaries and governments stepping in. It aims and self governing code and having code and economics run on the same systems. In a secure, traceable, immutable and unhackable way.

The next generation of Internet will not be fundamentally different from the way we use it now. There will be readable content, writeable content, things you can interact with and things that you can download. But it will come from different sources, with different privileges and different ways to access that information.

There we have it! An in-depth lectures on helping you to understand the web 3.0 era. I look forward to seeing you in the next lecture, where I’ll be explaining the blockchain we’ll be working with on a practical level as we move forward.