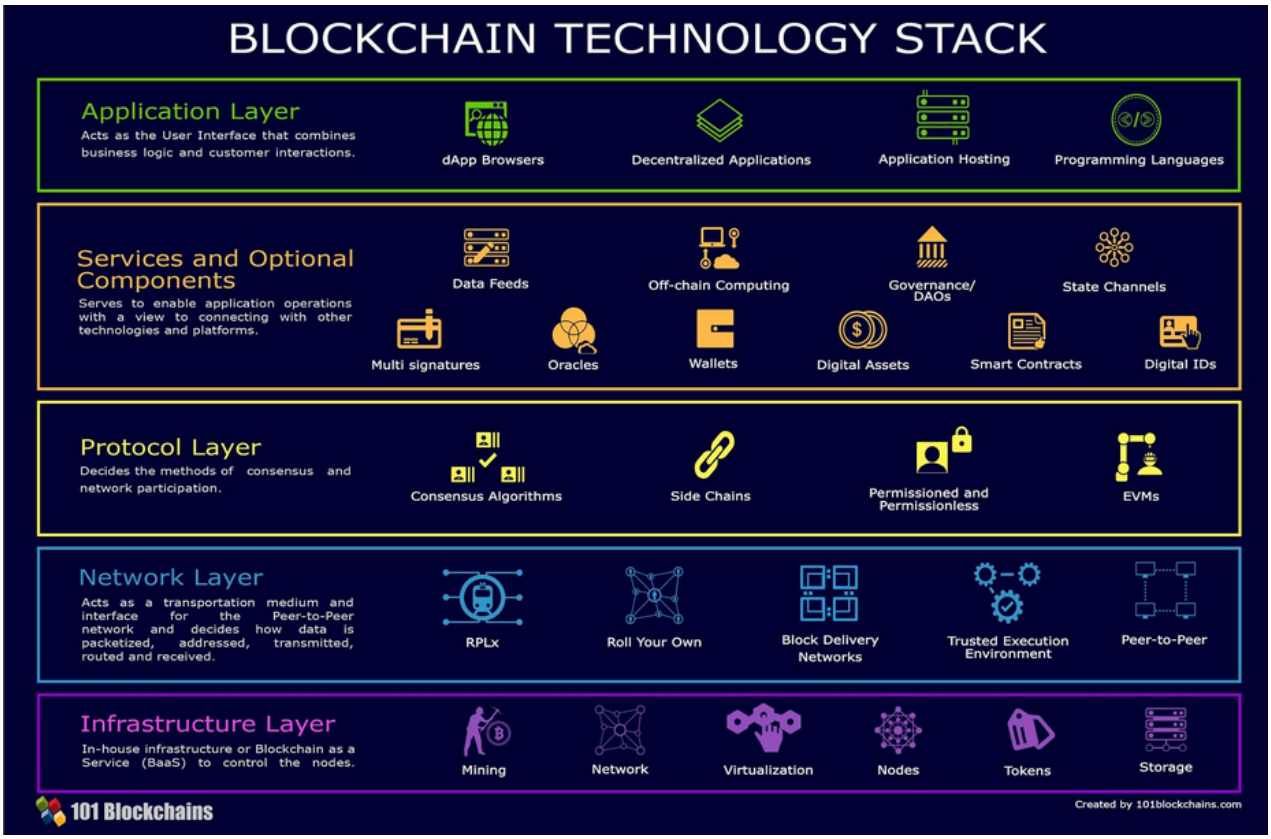
2.3 Blockchain Layers - the different positions in the field (1/2)

We explained how a blockchain worked on a high level and if you paid attention in previous class you now also know the different types of fields a blockchain consists of and the different topics and properties you can tweak within those fields (leaves). In this session will we discuss the e different positions you can partake within that blockchain technology ecosystem. We will use the sports analogy once more, let´s compare it this time with soccer. As with soccer and other sports, you can have a position in offense, defence, midfield etc and within those positions there are multiple options as well. As a defender you could for example be the goalie or a back. It is the same thing when we discuss positions in blockchain technology. Not only will different ballgames (= different use-cases / different goals) will lead to different positions. But you as a single entity, as an individual, can decide the position. Do I want to play defence and become a miner or a node, do I want to attack and become a ("grey-hat") hacker. Just as in sports this should be based on your talents and preferences to maximise your contribution to the team (blockchain ecosystem. **Key note is that there are in general multiple positions in blockchain ecosystems and that you should select your position based on your talents and likings. But just as with sports, you can have multiple roles depending on the situation as we will explain.**

Overview of the different layers. There are many other different representations possible, but this one gives a decent basic overview. The blockchain stack consists in general out of:

1) **An infrastructure layer**
2) **Network layer**
3) **Protocol layer**
4) **Service layer**
5) **Application layer (incl. browser)**



(Lichtigstein, Web 3.0 Will Be Powered by Blockchain Technology Stack, 2018). Most likely derived from the [OSI model.]

When we compare a blockchain technology stack with soccer, we would start with the goalie (all the way in the back of the field). In this analogy this would be the outer line of defence, the core layer and the infrastructure. This means the back bone of the infrastructure we are using (also known as the "back end" of the system, comparable with the back office in a company): There we need to decide essentials that impact all the other layers, like what kind of mining will we chose (type of hash: SHA-256 or SHA-3 or KECCAK or ……), how many nodes do we aim to engage (how big should the blocks be)?

If we decided about those essentials, we need to figure out how to communicate between these miners and nodes and the network. How will we send the packages between entities (GETH for example in Ethereum). This is also known as the network layer and can be seen as not only the goalie shouting out orders to the defenders, setting up defence and creating order, but also the players the way the players in the field will communicate. Without communication the entire ecosystem (team) will fall apart.

But even with core elements and communication between peers we need to have some rules to get each player of the team aligned towards the end goal (depending on the use-case / blockchain). For this we use a set of rules, which is as you know called the protocol layer. Here we decide what the truth is and built upon the core

elements given in the infrastructure. Consensus can adjust during the course of the game, like the forks of Bitcoin Cash or Ethereum Classic have proven, but the core elements in the infrastructure often remain the same.

If we now and understand the core elements, the way we communicate within the team and the rules that we need to abide by we have a shared understanding. This is a good starting point to start building services and add-ons on your layers. This is also where you get more out of the back end and move towards the front end (outside the techie part and more to the part that is visible for users). Here we see wallets for users arise and interaction with the outside world of oracles. Still a bit techie, but more interaction with the outer realms of blockchain. In the sports analogy this is the midfield, an essential bridge between the back end and front end.

On of the final layers (depends on what overview you use) is the front end application layer. This is where we "score", where blockchains should deliver the value according to their goals. In short: offering applications that offer an increased transaction cost efficiency and less TTP risks for example. An Ethereum dApp store for example where you earn money with your own data. Users perhaps don't even notice that their apps are running on blockchain technology, they reap the benefits without realising what the back engine is (the different layers as discussed). This doesn't really matter though: in general how many people use the internet, but have no idea how it works? I personally expect blockchain will have a similar effect± people use the dApps, earn money with it and have better security, privacy and transparency etc., but have no idea how it works. We challenge you however to learn these basics to understand this infrastructure of the future. As mentioned: "ignorance is a choice".

Side note: sometimes an overview separate the browser as an additional layer, but that doesn't really matter: just remember this as the front end of the blockchain stack where interactions with users happen and where the value is delivered and acquired.

As with sports: every individual plays an important role in the team. Sometimes the goal keeper (back end) is essential for survival, another time the goal scorer is the hero of the team ("the killer app"). In short: we are all in this team together and no matter your position and although you might not receive as much glory as the hero of the day scoring goals and attracting the supporters to the stadium (users): your role in the ecosystem and team is essential. **And remember: just as in sports, you can shift positions and be active in multiple layers (which we suggest, because you understand the "game" better if you have been in multiple spots in different situations).** That + the possible impact your work might have on the paradigm shift is what makes this digital realm with its decentralised blockchains so awesome !!!

Further readings

- Blockchain stack: https://hackernoon.com/web-3-0-will-be-powered-by-blockchain-technology-stack-626ce3f828c7
- OSI model: https://en.wikipedia.org/wiki/OSI_model

Summary

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