

What's blockchain got to do with edge computing?

Blockchain and edge computing have an interesting interdependent relationship. Edge computing/a distributed compute architecture can provide an infrastructure for blockchain nodes to store and verify transactions. On the other hand, blockchain could enable a truly open distributed cloud marketplace.

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How blockchain works

In general, blockchain has become synonymous with the term distributed ledger technology, despite technically being a subset of the latter. The ISO blockchain working group definition for blockchain is “Distributed ledger with confirmed and validated blocks organized in an append-only, sequential chain using cryptographic links.”

We covered an introduction into blockchain and the key uses in our first report “[Blockchain: What’s in it for telcos?](#)” The key thing to know is that it is a technology that allows multiple parties to share a common, append-only database. This is useful for enabling transactions between organisations, departments or individuals without relying on an intermediary, by creating a transparent, timestamped history of every transaction. Smart contracts are often key in blockchain systems, as they allow systems to automate virtually any kind of transaction between any type of end-user.

The second thing to know is that there are still fundamental challenges inhibiting blockchain from becoming truly scalable...yet. Power consumption and time lag in processing transactions across this distributed ledger increase significantly as a blockchain expands, particularly in blockchain systems that are open, therefore the number of participants is not controlled.

Edge computing could help alleviate the challenges of blockchain

Some of the issue around the time it takes to process blockchain transactions is due to the amount of processing power required, which means that general purpose servers and processors may not be adequate. Graphical processing units (GPUs) can provide the high processing power needed and companies such as [NVIDIA](#) are already benefiting from the demand created from blockchain and cryptocurrencies.

Edge computing has little influence on this, other than the fact that edge computing infrastructure may be more likely to have GPUs and high compute processors given that many of the applications for edge computing are high bandwidth, low latency types which demand these capabilities anyway.

However, another factor contributing to delays in blockchain networks is due to the way in which network architectures are built today. For blockchain nodes to communicate with one another, data has to travel through the entirety of the network and back, which is how traffic flows in cloud computing. An edge computing network would create mechanisms for new data flows, server-to-server, and remove the need for data to have to traverse through the core network.

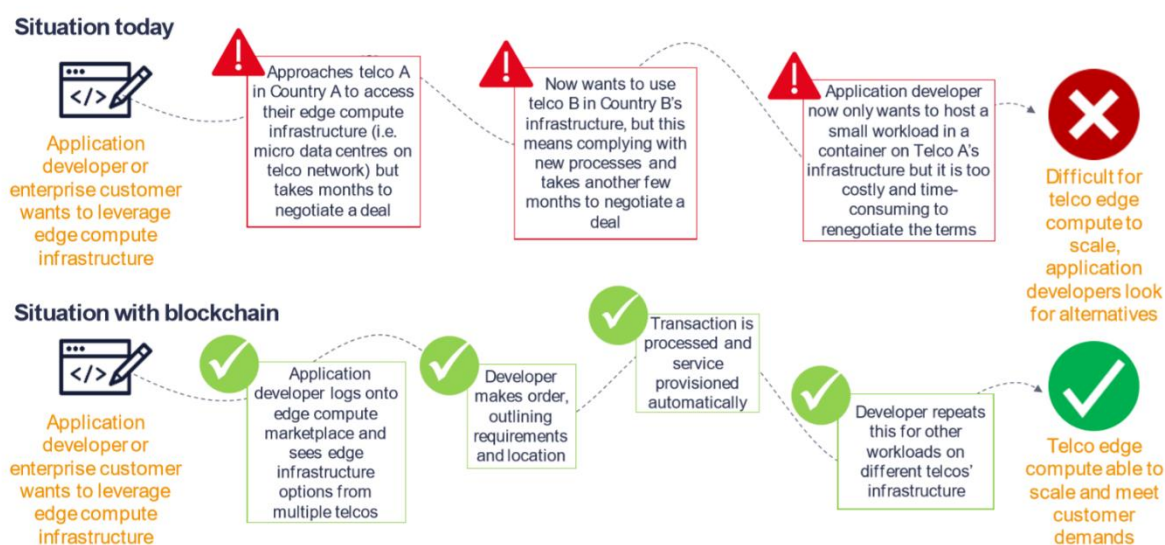
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But blockchain can support edge too

One of the challenges with (telco) edge computing is creating a commercial model that makes it easy for developers to access edge cloud infrastructure. There is a risk that edge compute infrastructure remains fragmented across telecoms operators, which means that an application developer would have to interface with each telecoms operator to ensure the application works across consumers within a country and across borders. Otherwise, the developer risks not being able to guarantee a consistent (low latency) experience.

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Operator fragmentation poses a challenge for edge computing



Source: STL Partners

One way this problem could be resolved is through aggregation, with single entities taking on the role of creating the single interface that telco edge infrastructure plugs into. The issue with this is that it produces control points, as we have seen in the cloud market with the hyperscale giants (AWS, Azure, Google Cloud Platform, etc.) taking most of the market share, particularly in public cloud.





Instead, blockchain could be used to create a decentralised edge computing marketplace matching suppliers of edge infrastructure with those who demand it, without a single control point. This is how the process could work in practice, although we cover the use case in more detail in our report ["Moving beyond the lab: How to make blockchain pay"](#):

1. Tenant (e.g. application developer) defines deployment criteria (order)
2. Order is placed on the blockchain
3. Blockchain tries to match tenants with edge compute providers through auction
4. Lowest bid (that meets criteria set by tenant) wins
5. Tenant and provider matched and lease (smart contract) is automatically created and posted on blockchain
6. Containerised workloads move onto tenant's infrastructure over secure overlay network
7. Workload is live and tenant pays for resources with cryptocurrency (potentially)

There are a few start-ups who are already exploring this concept, many of whom see the break up of the cloud providers' control points as their *raison d'être*. Below we've highlighted some of these innovative companies developing blockchain-enabled edge computing marketplaces.

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Start-ups creating edge computing marketplaces

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Provide hardware for blockchain processing	unknown	Y	unknown	unknown
Transactions (for access to edge) in tokens	Y	Y	“Pay” for blockchain processing	unknown
Type of computing resources	any	Mainly data centre	any	any
Framework used	unknown	Tendermint, Zeus (Ethereum)	Ethereum	Ethereum

Source: STL Partners

If you would like to learn more about edge computing, please do check out our [Edge Hub](#) or reach out directly for more on how STL Partners can support you.

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Or visit STL Partners’ Edge Hub

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