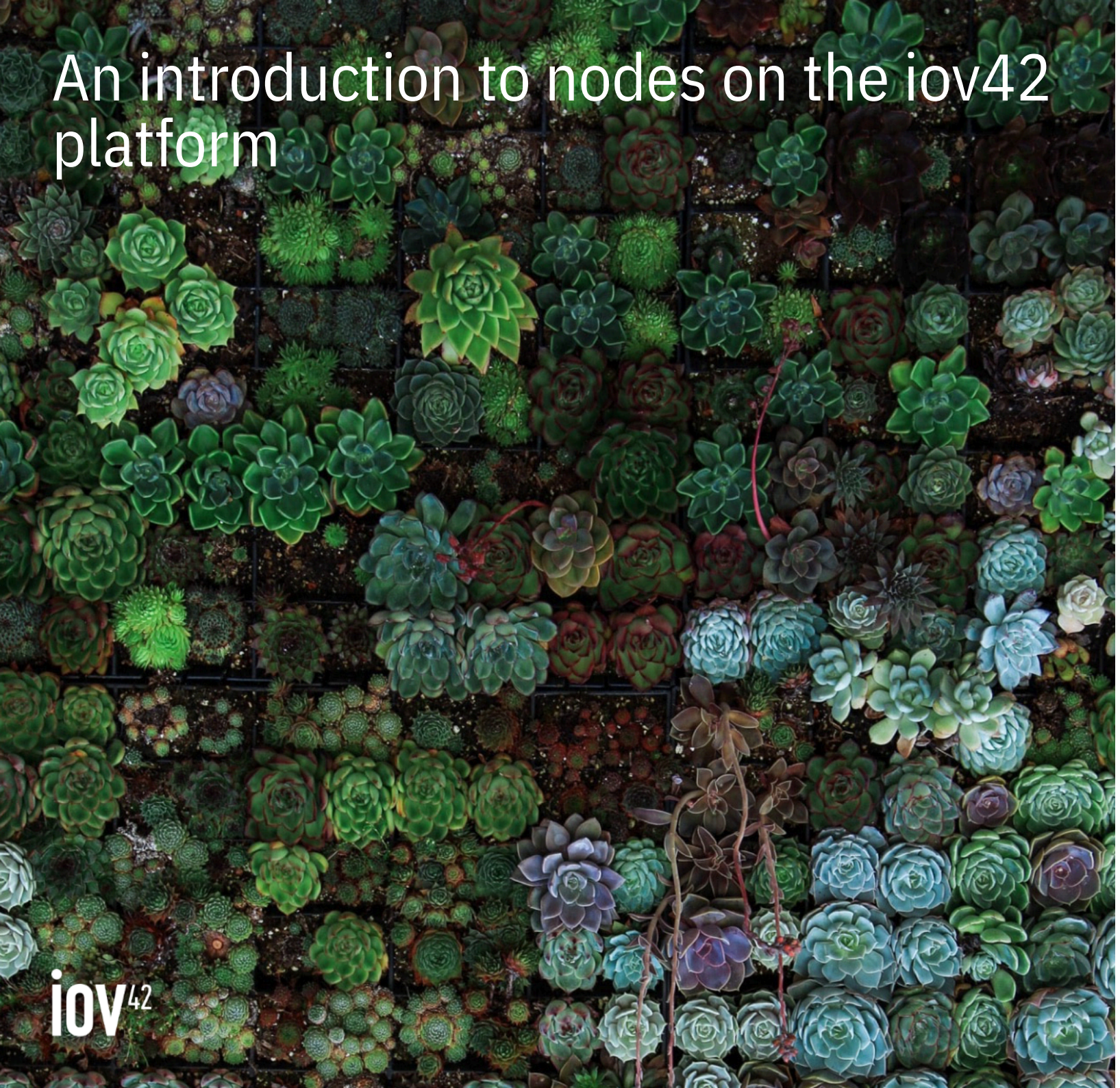
An introduction to nodes on the iov42 platform



iov42

What is a node?

At the core of distributed ledger technologies (DLTs) is the distributed ledger itself, which is a record of transactions happening within a DLT system. Unlike conventional ledgers, which traditionally record transactions in one central location, distributed ledgers store their data across a network of nodes. Nodes can be any kind of device that has the connectivity, storage capacity, and processing ability to support the DLT. Depending on the DLT, nodes can range from laptops and PCs to specialist farms of custom hardware.

Nodes form the decentralized infrastructure of DLTs, such as blockchain. In traditional blockchain models, having more nodes within a system improves resilience against system-threatening events such as power outages, other technological failures, or certain exploits. Some blockchains are being run on thousands of nodes.

However, an increasing number of nodes does not necessarily improve the performance of classic blockchains. If each node must process and record all of the blockchain's transactions, as well as store other related data (e.g. cryptocurrency wallet balance, smart contract code, etc.), the performance

of the blockchain could be greatly limited by the computing and storage capacity of one node, as well as the need to use slow consensus algorithms to prevent unwanted interventions.

The traditional blockchain model of a single device serving as a node simply does not scale.

What does an iov42 node look like?

In order to build a DLT network that can operate at a global scale, iov42 has reimagined the structure of the node. Instead of using single computers as nodes, the iov42 network uses data centres that can leverage all the advancements and scalability that comes with distributed computing and cloud supporting technologies, such as AWS, Azure, and GCP. And because the iov42 network has been developed using technologies such as Docker and Kubernetes, it can be deployed to different cloud providers or even a traditional data centre.

With nodes as data centres, the various functions of a node— communicating, validating, committing, synchronizing, storing data, etc.— can be broken down and carried out independently. The main benefit of using data centres is scalability, which in turn improves resilience, performance, and the ability to add resources as needed as the data across the system grows.

If each iov42 node is a data centre, this means not everyone can run a node in an iov42 network.

However, iov42 considers this to be a benefit to the network rather than a constraint. Limiting the number of participants within the network has a positive effect on the performance of the system. This also means that node operators will be recognized entities that agree to collaborate within an iov42 network. Deliberate network formation through strategic node selection increases the system's flexibility to address issues such as governance, industry-specific security concerns, and data locality.

Connecting iov42 nodes

Another unique feature of iov42 nodes is the way they connect with one another. Instead of thousands of nodes interconnected globally, only a few nodes connect locally to form what iov42 calls a "zone." Across the iov42 network, zones can be optionally connected, enabling local regulatory frameworks to be built into each zone and creating a "network of networks."