

Nexusless: Building a Peer-to-Peer Content Delivery Network

Management Summary Nexusless Research Team

The recent emergence of distributed applications is challenging the tendency towards concentration which seems to have been natural for most digital services. At the same time, advances in computing and novel business models are enabling more and more economic sectors to unlock the value of unused assets, be it apartments, cars, or one's free time.

The Internet has greatly catalyzed most of these trends, but the World Wide Web itself is still operating according to a client-server model created at its inception; this model implies the existence of relatively few specialized nodes (servers) that process incoming requests from the rest of the users (clients). It is often more efficient for the servers to be aggregated into large farms (poetically called "the cloud"), increasing centralization as well as posing scalability, availability, permanence, and trust challenges. While the web hosting and storage markets have remained reasonably competitive, the content delivery industry is concentrated within a small group of large providers, with one of them accounting for more than *a third of the entire web traffic* at each point in time, according to self-reported figures.

These issues can potentially be mitigated by tapping into the spare bandwidth, storage, and processor time of the billions of consumer devices spread throughout the modern world. Each of them is now significantly more potent than the most advanced supercomputers of the 1990s and is being actively used only a fraction of the time. In other words, instead of delivering content exclusively by specialized computers from remote server farms, it makes sense to serve it from nearby available laptops or smartphones – *which is what Nexusless aims to achieve at scale*.

Nexusless is a distributed, peer-to-peer content delivery network (CDN) that enables fast, secure, and efficient serving of websites, applications, streaming content and other data within the existing web infrastructure. At the heart of Nexusless is a content-addressing filesystem based on the [IPFS](#) proposed by the Protocol Labs – a hybrid peer-to-peer file exchanger and versioning system, with each piece of data having a permanent and immutable name based on its unique cryptographic signature. Mutable containers and addresses are also envisaged in order to integrate seamlessly into the existing web infrastructure such as Domain Name System (DNS).

In order to provide incentives for the users to pledge their storage and networking capacity, a market layer is added to Nexusless which allows keeping track of the network activity without a central intermediary. This is made possible by using a public blockchain with a consensus protocol based on proofs of retrievability and delivery. The necessary transaction speed and frequency is ensured by a micropayment network functioning on top of the blockchain, similar to the [Lightning](#).

As a result, any person in possession of a consumer computing device (a laptop, a desktop or even a smartphone) is able to earn income on the Nexusless network by acting as a miniature edge node (point of presence) which delivers web content to end users. The content-addressing foundation helps prevent data tampering, while physical proximity contributes to lower network load and latency (short loading times).