

Huddle01 dRTC: Democratizing Digital Connectivity over Cyberspace

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Abstract

A fully decentralized, self-sovereign, borderless and open network that will provide the necessary framework for performant, cost-effective, and censorship resistant real-time connectivity for every one, anywhere across the globe. Recent developments in decentralized physical infrastructure networks, crypto-economic systems design and RTC technologies provide the necessary foundation that makes dRTC(decentralized real-time communication) possible. These innovations have enabled us to transcend the archaic axioms current RTC Systems rely on like centralized orchestration, application specific infrastructures, and heavy reliance on data centers to now build a pool of bandwidth as a permission-less commodity termed as the dRTC Network. Doing this requires a robust dRTC framework that is powered and governed by the people, thereby providing a secure and reliable medium for real-time communication to the all the citizens.

Keywords— dRTC, RTC, DePIN, Media Nodes, surveillance, cost-effective, open innovation, accessibility, hyper-organic, WebRTC

Communication is the cornerstone of humanity. It's integral to our day-to-day lives, enabling collaboration with peers, progression of ideas, completion of tasks, and once in a while a creation that can alter the society.

Over the years, how we communicate has drastically changed. The evolution from primitive communication to real-time digital interactions has bridged physical distances, enabling instantaneous exchange of ideas and enhancing global connectivity.

Real-Time Communication or RTC, is a set of technologies that enable the real-time, instantaneous exchange of audio, video, and data between devices over the internet. This means that the information is sent and received with minimal delay, allowing for seamless communication experiences.

However, the current landscape of audio and video communication is monopolized by large corporations that exert unilateral price and supply dominance. These oligarchic practices often lead to security vulnerabilities and poor connectivity for end users, and high setup and maintenance costs for RTC service providers.

Traditional real-time communication (RTC) providers have been implicated in unethical data exploitation, including monetizing user data and utilizing it for analytics or artificial intelligence purposes without user consent. This violates fundamental user privacy rights.

Furthermore, the geographic disparity of data centres necessitates routing data across vast distances, often resulting in increased latency in areas with poor infrastructure. Additionally, the egress fees levied upon transfer due to routing from over long distances become expensive. These fees also apply when data is uploaded, downloaded, or moved from one cloud storage to another. So, while pay-as-you-go sounds very affordable, these charges bundle up to a huge number.

Forecasting future costs, the global cloud computing market size is projected to grow from \$371.4 billion in 2020 to \$832.1 billion by 2025, at a Compound Annual Growth Rate (CAGR) of 17.5% during the forecast period (source: MarketsandMarkets Research). This growth suggests that unless pricing models change, the cost of running RTC apps on cloud infrastructure will continue to increase, posing financial challenges for businesses, especially startups and mid-sized enterprises.

At Huddle01, we are democratizing the real-time communication landscape with our dRTC(decentralized real-time communication) Network. By breaking down the siloed architecture of existing servers, Huddle01's DePIN for RTC distributes the control and management across multiple nodes, eliminating single points of failure and reducing the risk of monopolistic control.

The decentralized architecture ensures that data layers are decoupled from centralized servers, and the media layer's distributed channels encrypt and scatter data, making it resistant to malicious interception.

One of the core principles of Huddle01's dRTC Network is also to optimize communication costs. Imagine a scenario where there are more proximal routing channels available. By increasing the number of geographically distributed data centers, particularly in underrepresented regions, the cost and complexity of packet routing would be significantly reduced. This would facilitate more efficient and cost-effective data transmission, enhancing the overall user experience.

The dRTC network democratizes access and fosters innovation by creating an open marketplace where anyone can be a producer and/or consumer. It's dRTC Network incentivizes producers for providing bandwidth to route audio/video

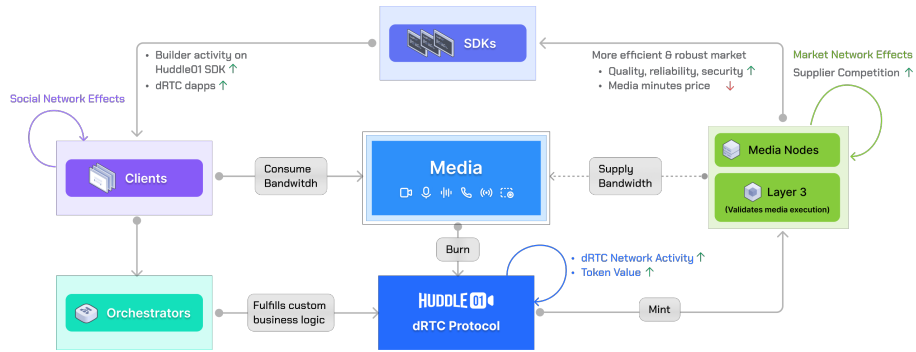


Figure 1: Workflow of dRTC Network

packets and consumers benefit from significantly improved connectivity as compared to traditional audio and video services. This multi-sided marketplace nurtures a sense of ownership and governance, reinforcing the decentralized ethos.

Central to this architecture is the Media Node, the primary supplier node of Huddle01’s dRTC Network which provides the necessary bandwidth for real-time communication. Operable by anyone, Media Nodes help operators contribute their excess internet bandwidth to the dRTC network, and earn rewards.

Media Nodes are engineered to manage high-throughput real-time communication without compromising the quality and user experience, ensuring the lowest latency experience for the end users of the dRTC network. Media Nodes connect to the nearest node, forming a global, dynamic, load aware, low-latency network that serves as a backbone for media communication. They utilize WebRTC to transmit media across nodes and end users.

Governed by hyper-organic and robust cryptoeconomic policies, the dRTC network also guarantees equitable incentivization of all Media nodes through \$HUDL tokens, building incentive alignment through shared network ownership. 21% of \$HUDL token supply will be distributed to Media Nodes.

Another critical component for the success of the dRTC Network is ensuring transparent and equitable operations, particularly the fair compensation of node operators who maintain the network. Operations must occur in an isolated environment, unaffected by other apps or protocols, to ensure transparency in global network state changes.

Arbitrum, with its zero-knowledge optimistic rollup architecture, EVM compatibility, scalability, low transaction fees, and robust fraud-proof mechanism, meets these criteria, making it the ideal solution for the dRTC Network. The

community's support for the DePIN narrative, coupled with enhancements like Arbitrum Nitro and Orbit, ensures dedicated throughput, EVM compatibility, and customizable Layer 3 chains, fulfilling all dRTC Network requirements.

The dRTC Network operates on the dRTC Chain, which is powered by Arbitrum Orbit and a suite of smart contracts each designed for specific functions. These contracts are key to the network's operations, handling the registration of nodes, staking mechanisms, incentivization to node operators, and the maintenance of the network's global state. The dRTC Chain is specifically optimized for high-performance, real-time interactions, making it ideal for applications like gaming and social platforms that require high-volume and low-cost transactions. This optimization perfectly positions the dRTC Network, which is inherently DePIN in nature, to support applications that are both financially and socially oriented.

Huddle01 envisions to become the backbone for real time communication for the new internet, with a dRTC network that's powered and governed by the people themselves. Our aim is an emergent \$HUDL economy where businesses can build and run applications and services that let individuals communicate globally with ensured privacy, low costs and ultra-low latency, fostering better real-time connectivity and collaboration.

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