# Abstract

These applications are poised to disrupt traditional centralized services such as Facebook, Twitter, Reddit, and Youtube. While the future of decentralized applications is promising, tooling and protocols that facilitate developer adoption are still in early development and often lack the components required to build truly decentralized applications. In order to leverage the benefits of decentralized applications such as enhanced privacy and disintermediation.

The ideas brought forth by Bitcoin and its underlying blockchain technology have led to the rise of decentralized applications. Online user-to-user interactions (social, economic, email) have come to rely almost exclusively on centralized intermediaries. Even Bitcoin and Ethereum rely on traditional centralized peer discovery mechanisms such as hard coding known peers or relying on DNS seeds.

Decentralized applications design constraints and often rely on centralized components to accomplish their goals.

While the promise of What is needed is a transport agnostic messaging protocol with accompanying incentive mechanism to facilitate the establishment of p2p communication channels (ie WebRTC)

We propose a protocol agnostic Decentralized Session Negotiation Protocol (DSNP) a transport a

# What are we building?

bDSNP; a bcoin plugin

that adds support for the Decentralized Session Negotiation Protocol (DSNP) to bcoin.

We present a decentralized “session” negotiation protocol. DSNP is accompanied by a suite economic and reputationally incentivized DSNP is designed to incentivize otherwise non-interested actors to facilitate the establishment of arbitrary p2p network communications channels in decentralized applications.

DSNP has pluggable support for payments; DSNP clients can pay nodes to relay traffic on their behalf

# Who is our audience?

DSNP was designed to make it easy for decentralized application developers to incorporate who want to incorporate user-to-user (p2p) interactions in their decentralized applications. D

# Docker Hub Description

<https://hub.docker.com/r/fcm4ypt/bdsnp/>

bcoin with support for DSNP (Decentralized Session Negotiation Protocol)

bcoin is a javascript implementation of the bitcoin protocol, this container includes a recent build of bcoin configured to start with the bDSNP plugin enabled.

DSNP is an experimental transport agnostic session negotiation protocol designed to incentivize the facilitation of peer-to-peer network communications. For the C4YT Hackathon we built the bDNSP bcoin plugin to incentivize the facilitation of WebRTC based PeerConnections by turning bcoin into a decentralized STUN server. Next we would like to implement DSNP as a Cosmos blockchain service that can interact with the Costmos Hub in order to provide DSNP services to the Cosmos ecosystem.

We are currently working on a paper that describes the mechanisms by which "dsnp nodes" can be economically incentivized to facilitate user-to-user communications in decentralized apps; in addition to strategies that can be employed to discourage node misbehavior.

For more information please visit: <https://github.com/Patrickdlg/dsnp>

## Inspiration

We believe that direct human-to-human interactions are at the core of what make decentralized technology valuable.

Online user-to-user interactions (social, economic, email etc) have come to rely almost exclusively on centralized intermediaries. It should be easy for blockchain application developers to facilitate these interactions.

## What it does

We propose a Decentralized Session Negotiation Protocol (DSNP). DSNP is a collection of economic incentives and tooling that support a decentralized session negotiation ecosystem. DSNP works by piggybacking on existing blockchain networks such as Bitcoin. The current implementation functions as a decentralized signaling service.

## How we built it

We created a bcoin plugin that runs a signaling server. We utilized web-sockets to facilitate a p2p connection between node-connected clients. We modified bcoin-docker to make it easy for developers to deploy bcoin nodes with our plugin, We created an Angular web application to demonstrate how developer would create and deploy applications using our bcoin plugin. The web application uses bcoin as a signaling server to establish a p2p connection between browsers using WebRTC.

## Challenges we ran into

- ssl certificate for Websocket can be a challenge in decentralized apps

- economic incentive design is tricky

- sending custom message types over Bitcoin network

## Accomplishments that we're proud of

- high level protocol specification is complete

- our bcoin plugin is fully tested

- our demo works

## What we learned

- bcoin is awesome and easy to extend

- mechanism design is hard

## What's next for DSNP

- implement ICE / TURN server functionality for bDSNP

- integrate DSNP as service on Cosmos that interacts with the Cosmos Hub

- bitcoin core implementation of DSNP

- off-chain reward payments with Lightening

- DSNP on Ethereum as a TCR (Token Curated Registry)

- R&D on implementing DSNP in an Ethereum Plasma Chain

- power peer discovery and session negotiation in browser based blockchain applications

- collect / pay to call