Splitting Payments To Increase Blockchain Effectiveness

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Blockchain

- Not scalable
- Low **throughput**
- High **latency**

Payment Channel Networks (PCNs)

- Transactions happen **off-chain**
- Deposit, cash out, conflict resolution happens **on-chain**
- **Fast** and **cheap** transactions

Bitcoin Lightning Network (LN)

- Widely used **PCN**
- Source routing
- Three main implementations: **LND, Éclair, C-lightning**

Interdimensional SpeedyMurmurs (IDSM)

- Payment **splitting**
- Routing leverages **local** knowledge

Research Question

How do **routing protocols** with **splitting** compare to the three different routing protocols that exist in the **Lightning Network** in terms of **effectiveness** and **efficiency**?

Methodology

Use **GTNA** to simulate the **Lightning Network** and **measure** the **success ratio** and **monetary overhead** of the protocols.

Simulation Scenario

- Static **LN** topology
- **100K Exponentially** distributed transactions with mean **100k**
- Average across **5 runs**

Results

- **IDSM** greatly **improves success ratio**
- Can route **difficult** payments, by **splitting** and **bypassing channels** with **insufficient balance**
- **Difficult** payments may also incur **huge fees**