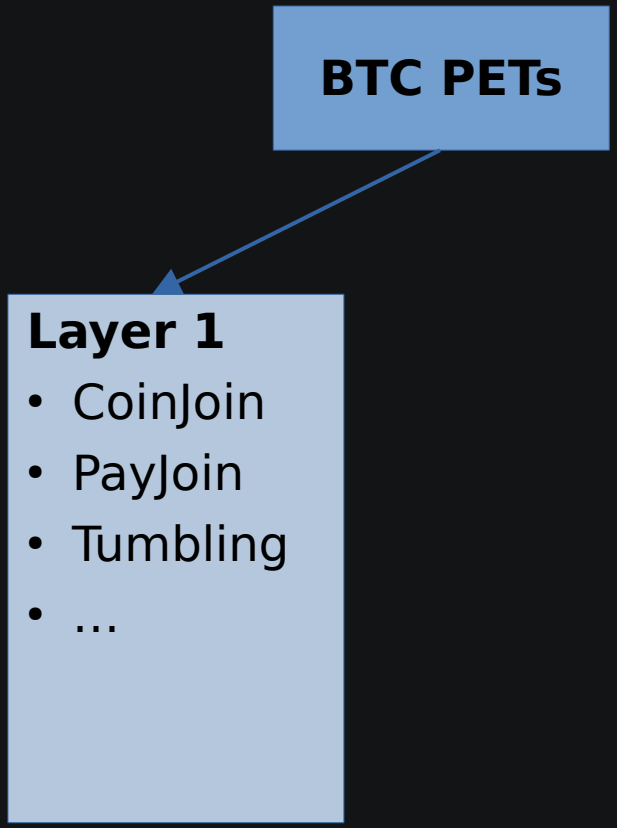
Improving Bitcoin’s privacy with Federated E-Cash Mints

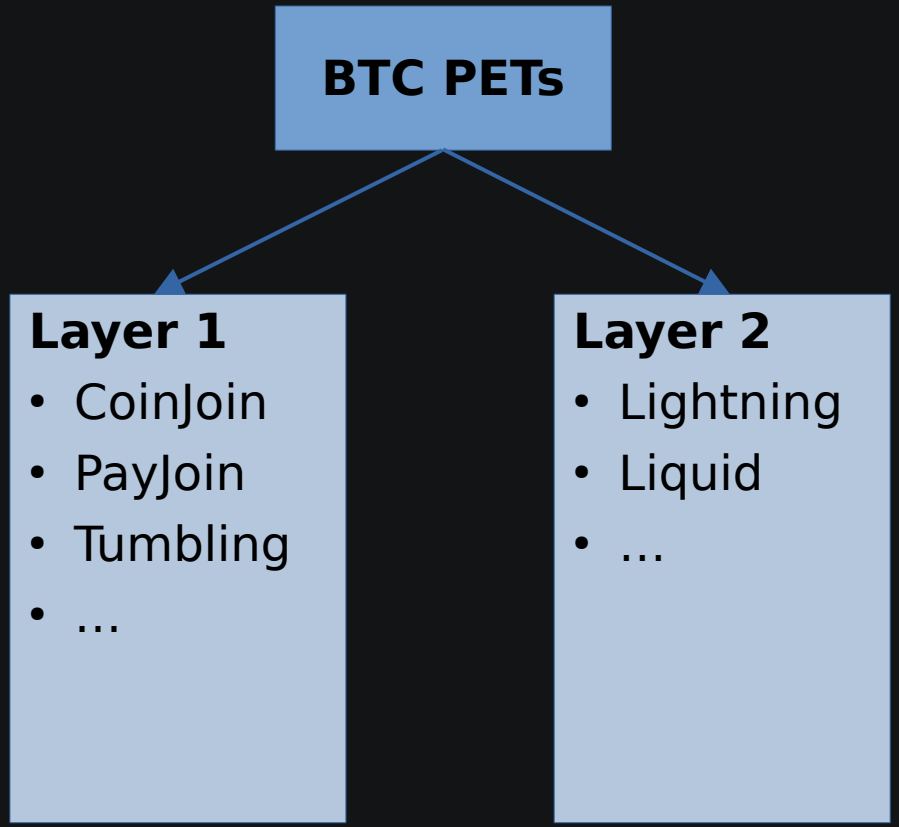
Twitter: @EricSirion github.com/fedimint

Blockstream

Bitcoin PETs Today



Bitcoin PETs Today



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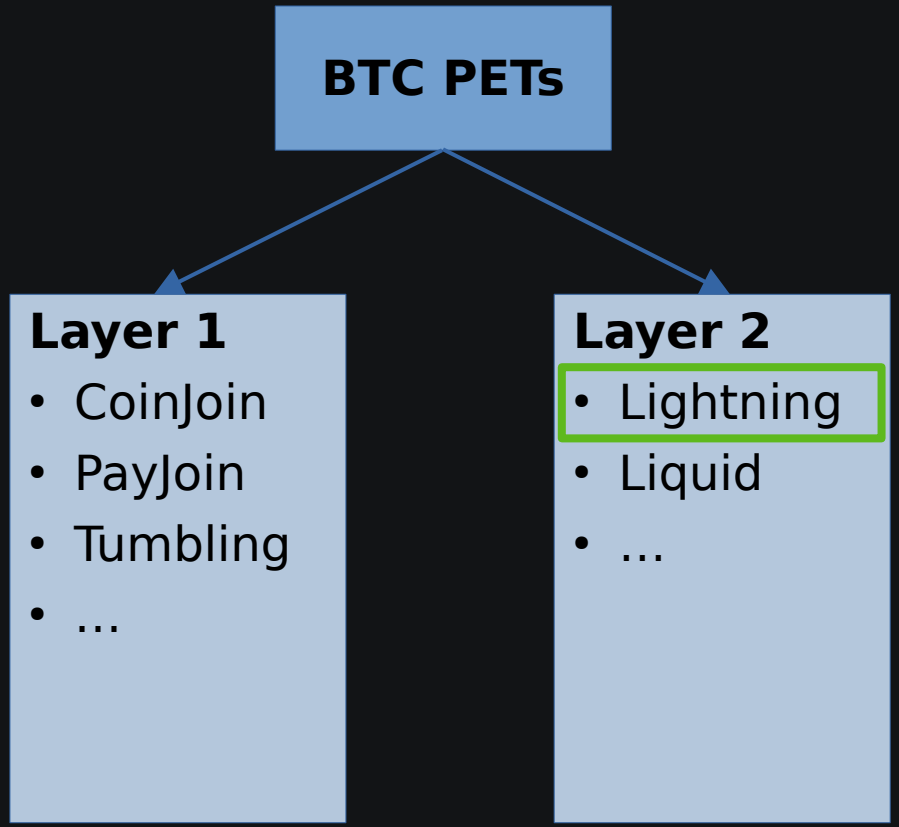
Bitcoin PETs Today



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Lightning Wallets

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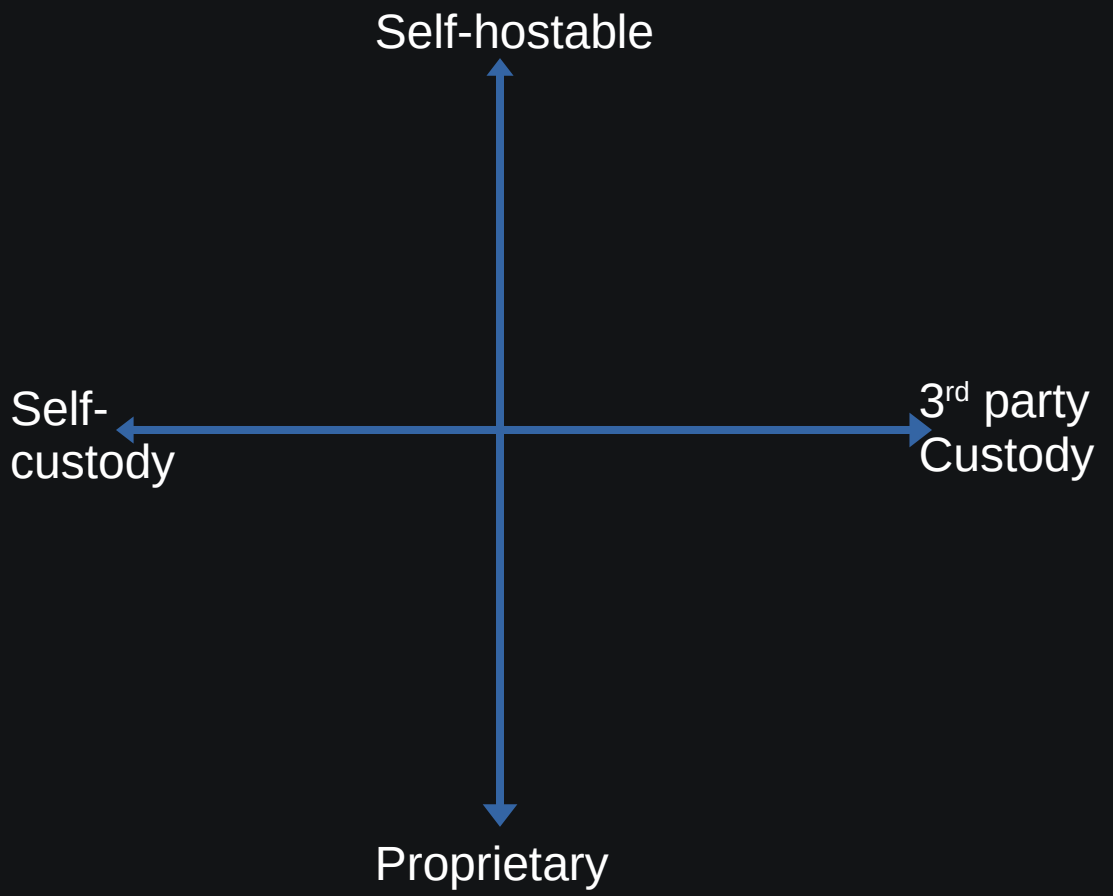

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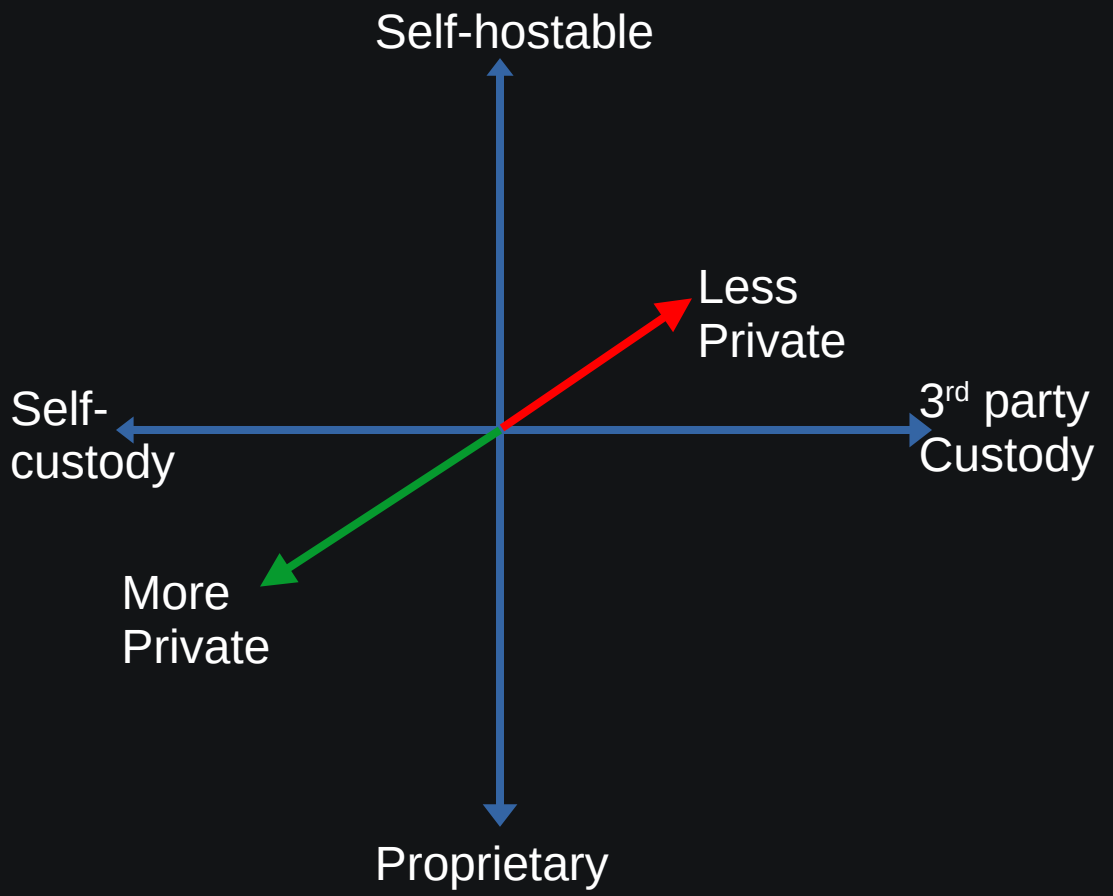

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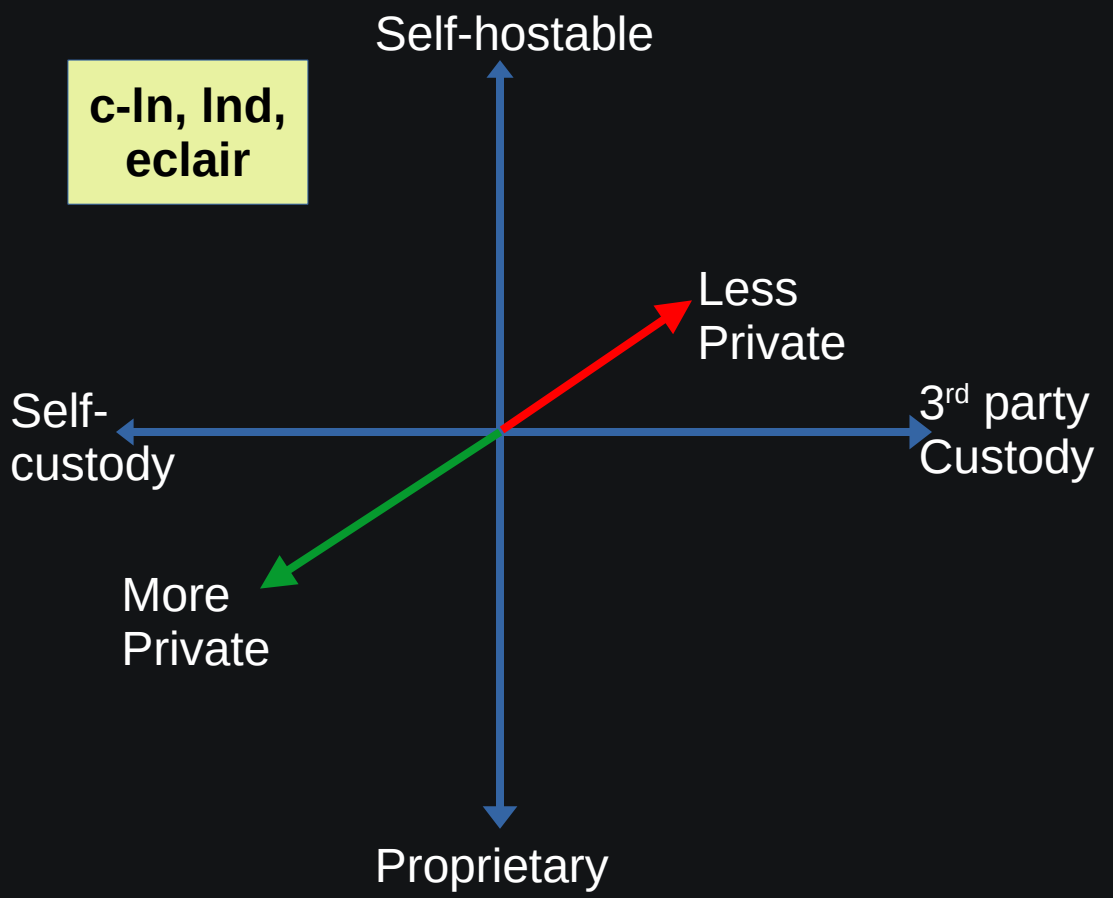

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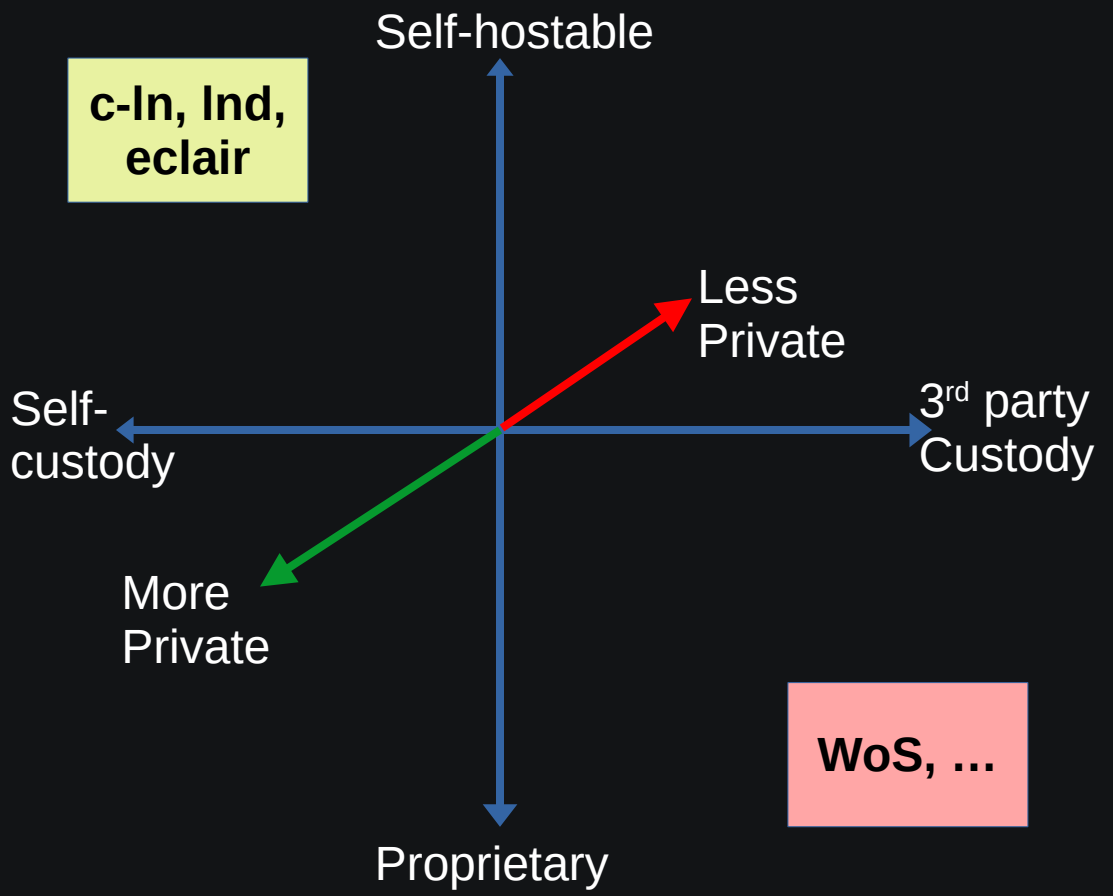

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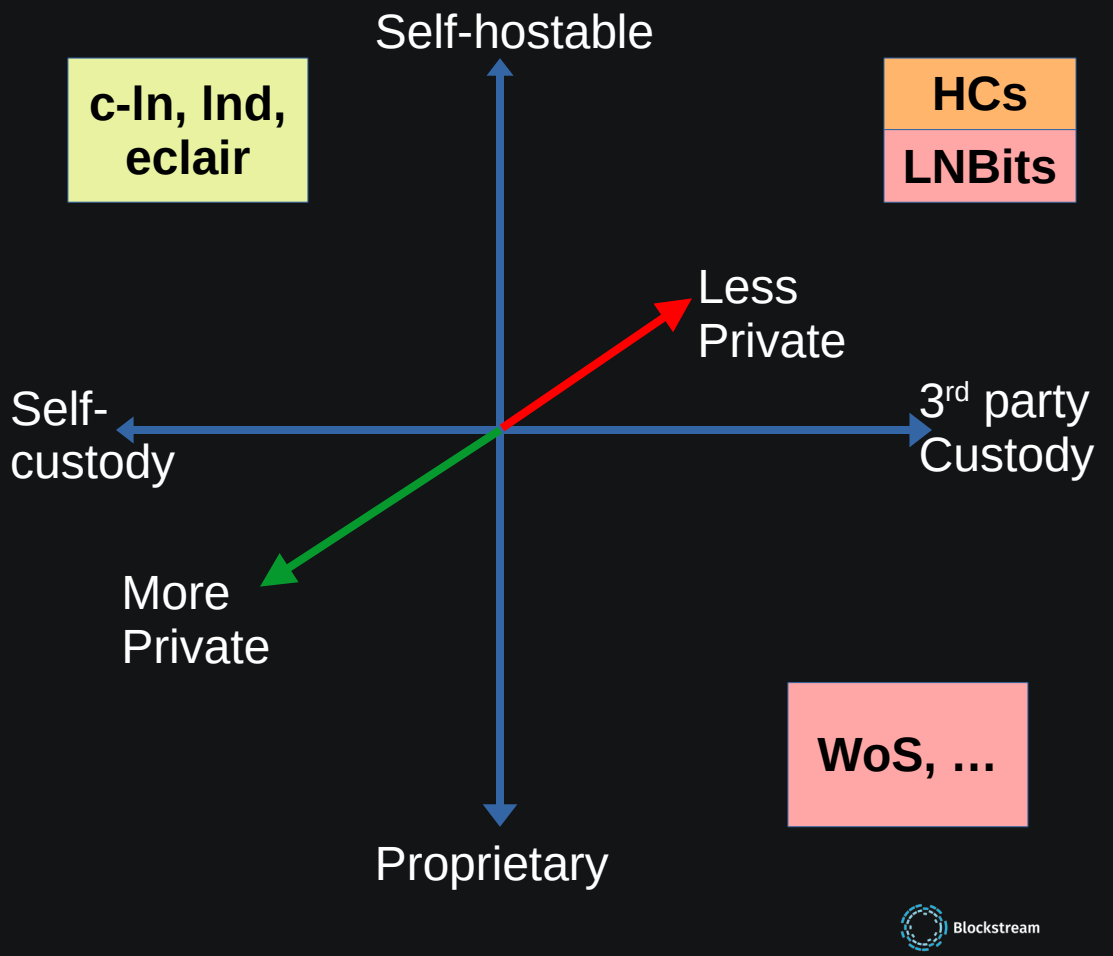

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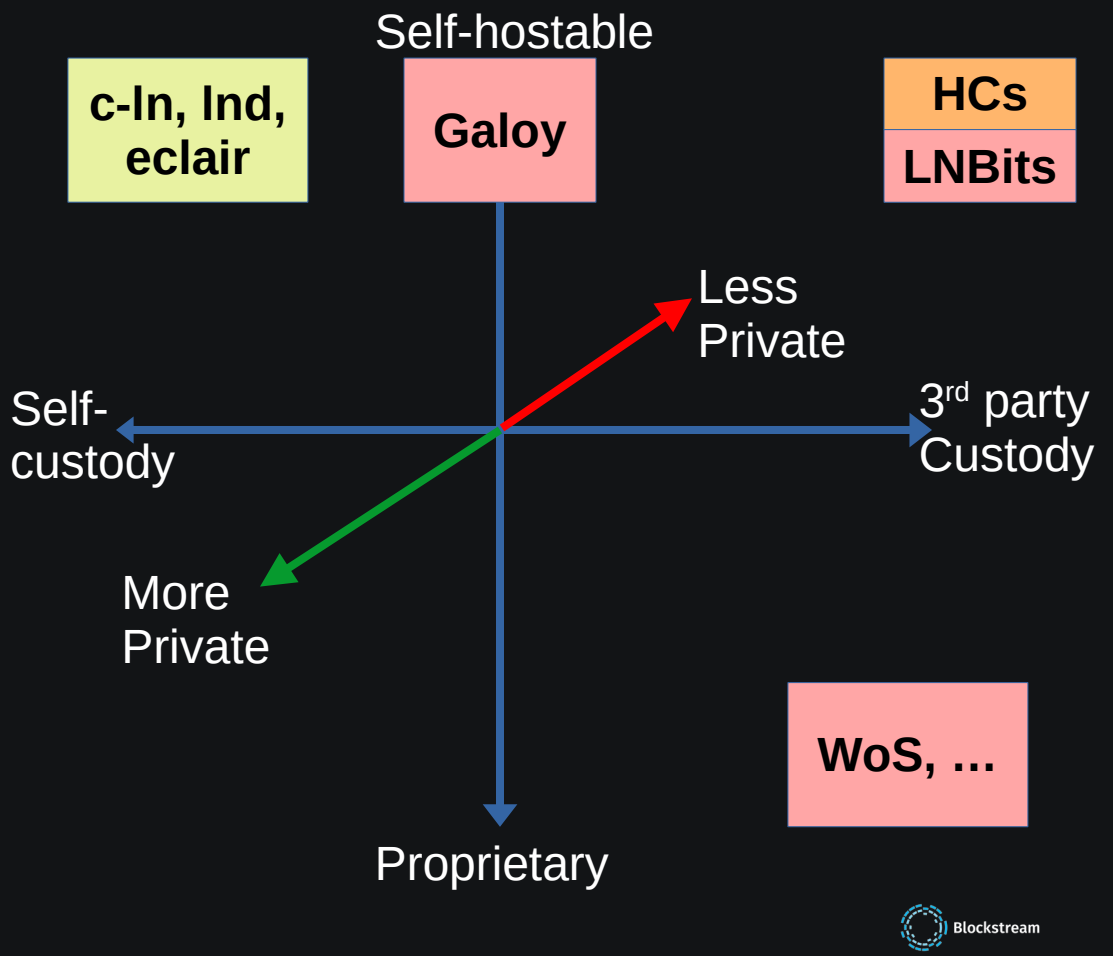

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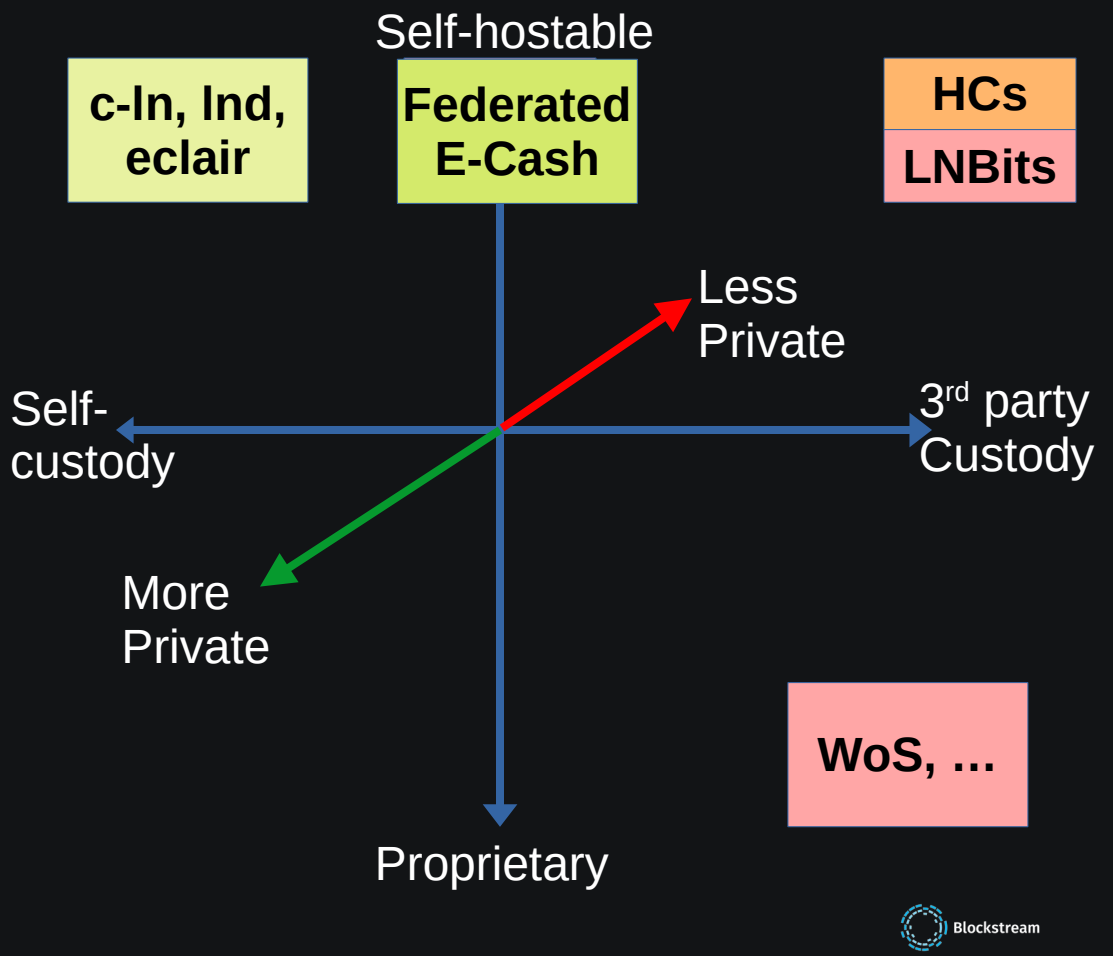

Federated E-Cash

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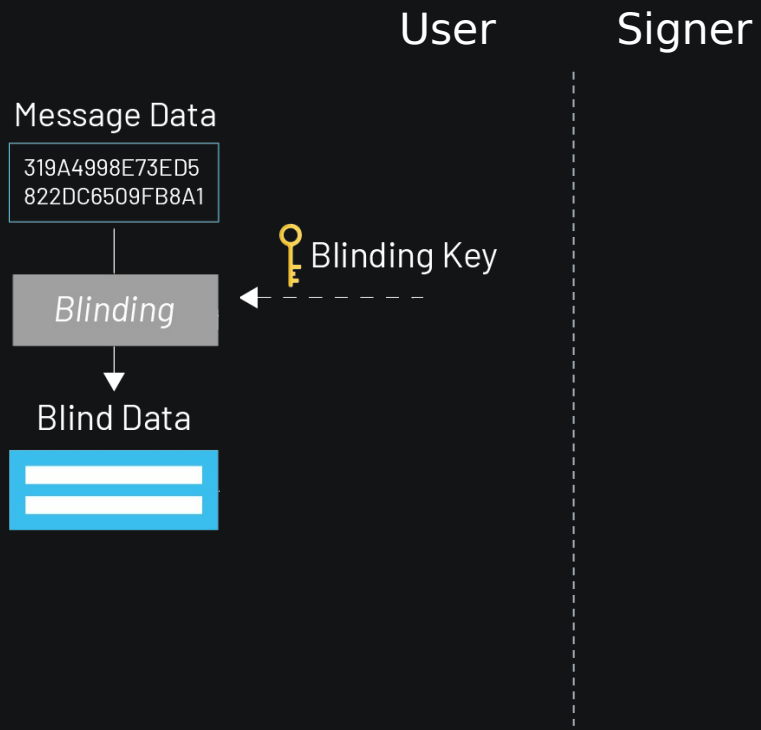
1 Traditional Chaumian E-Cash

Blind Signatures



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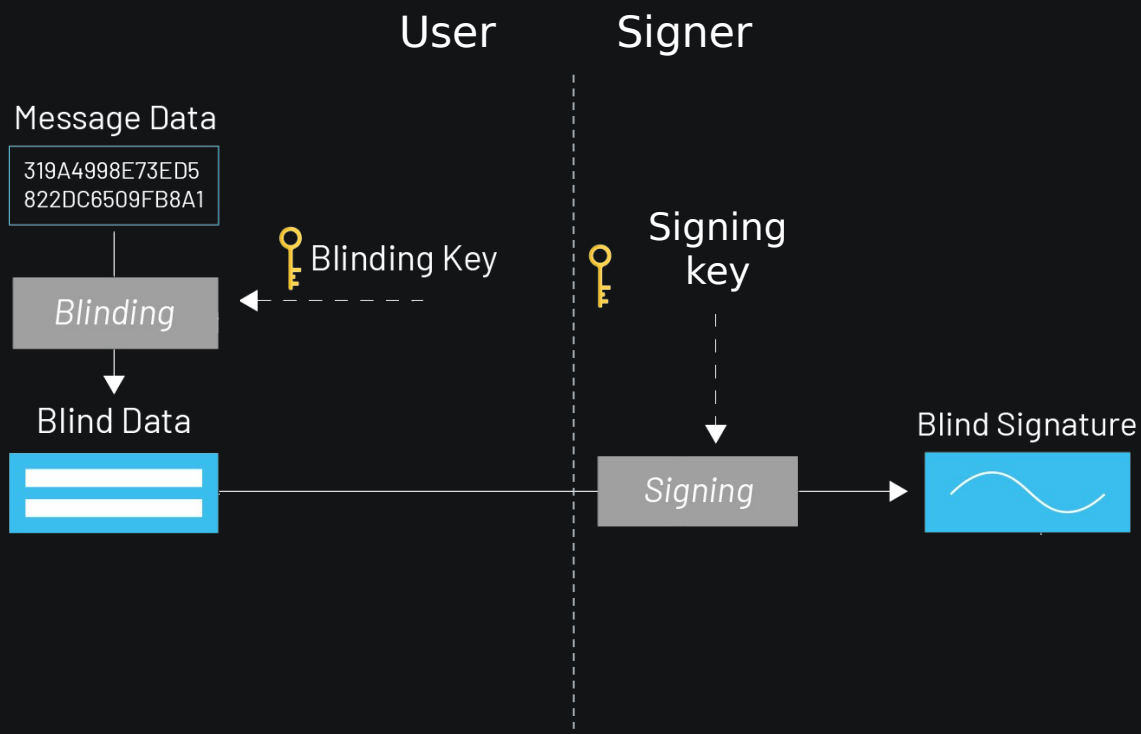

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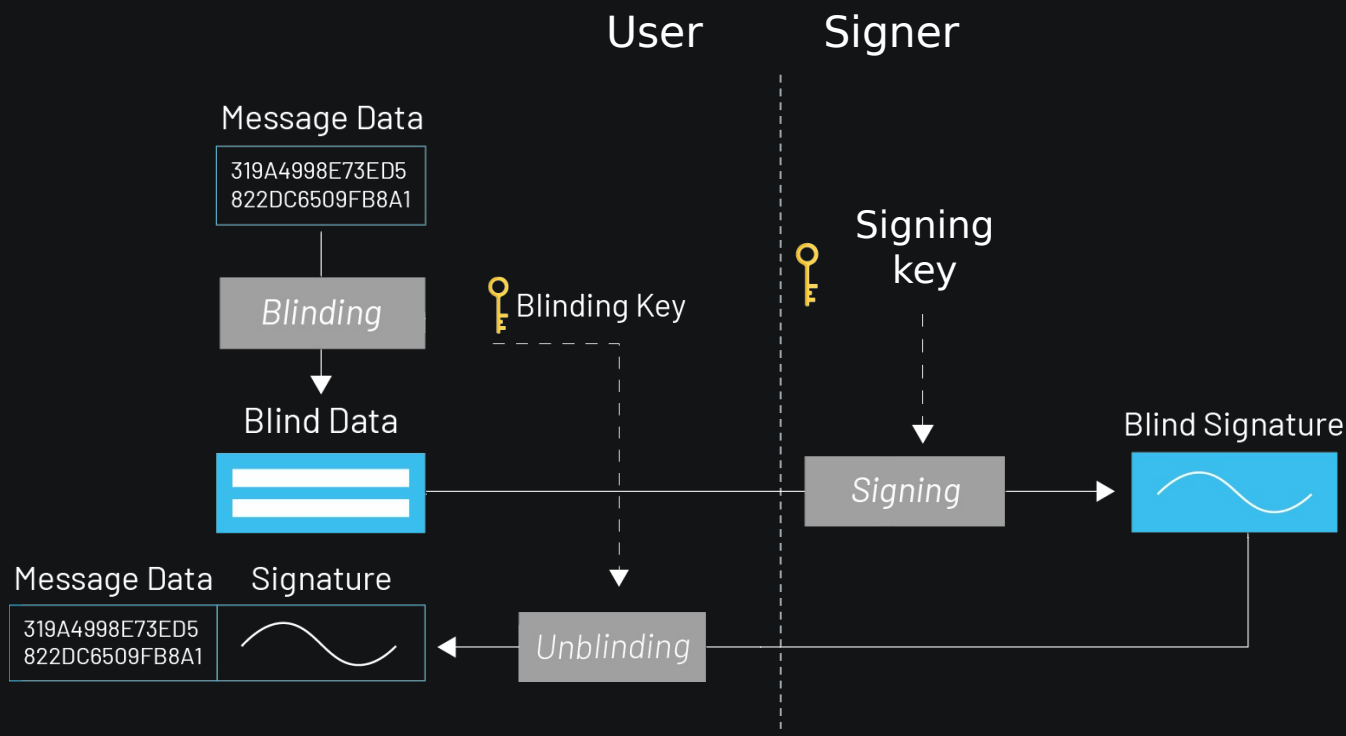

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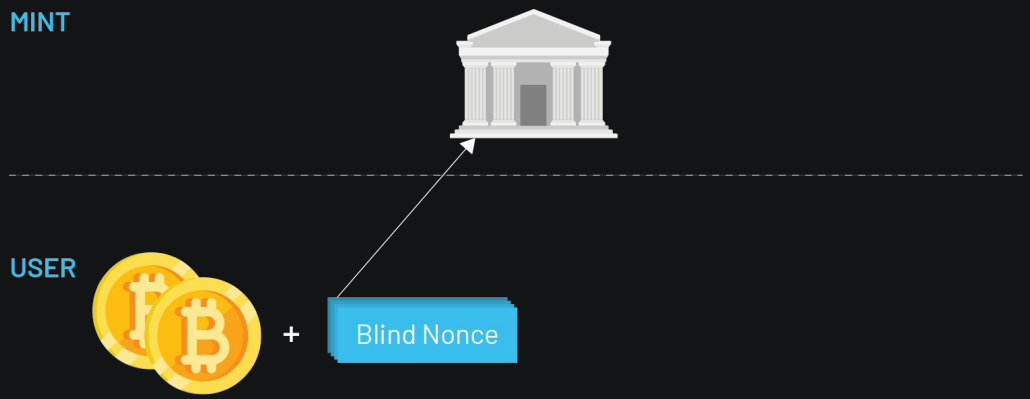
Traditional E-Cash **Issuance**

1. User Sends BTC + Blind Nonce to Mint



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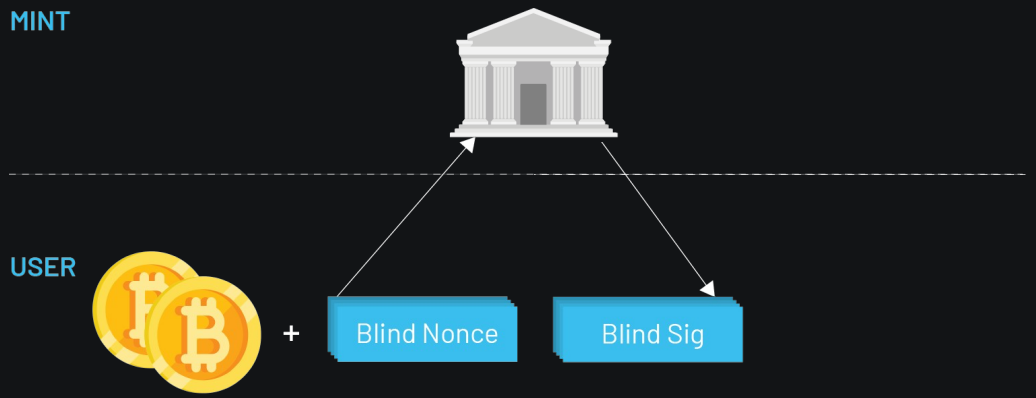
Traditional E-Cash **Issuance**

2. Mint Send Blind Sig to User



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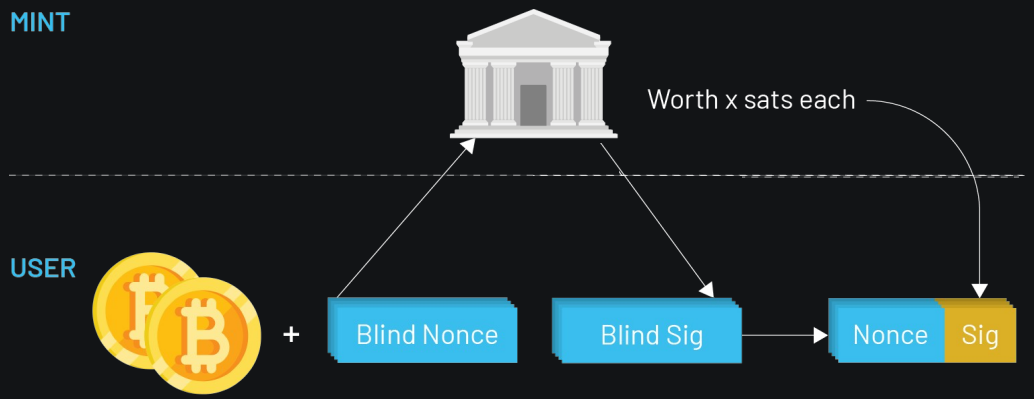
Traditional E-Cash **Issuance**

3. User Creates a Redeem Receipt



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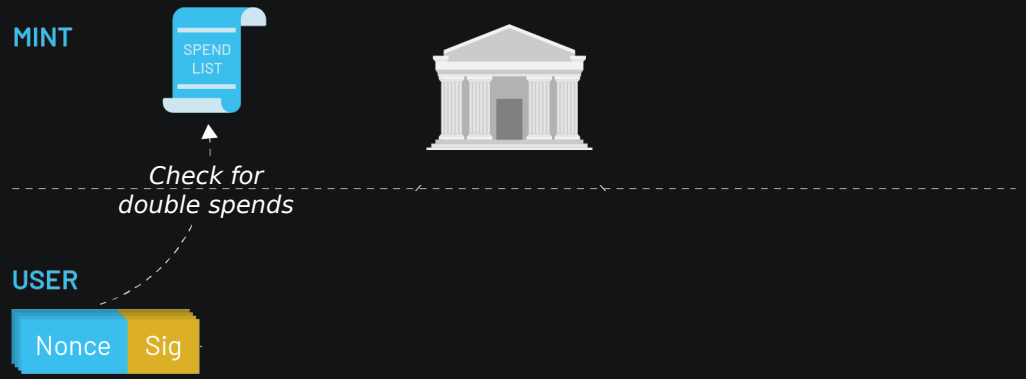
Traditional E-Cash **Spending**

1. User Checks for Double Spends



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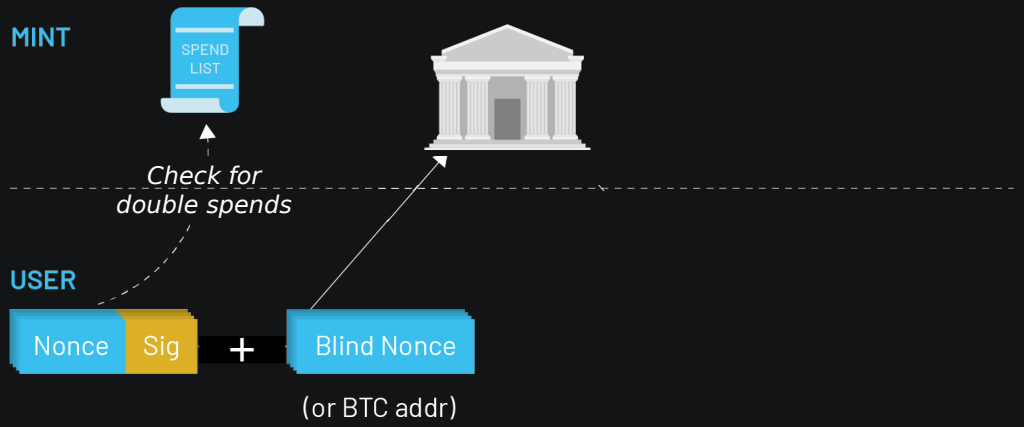
Traditional E-Cash **Spending**

2. User Sends Blind Nonce to the Mint



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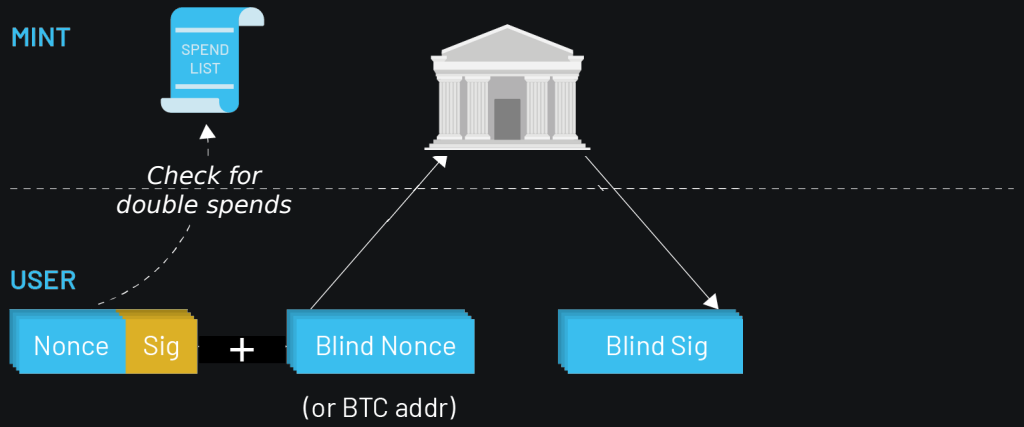
Traditional E-Cash **Spending**

3. Mint Sends Blind Signature to the User



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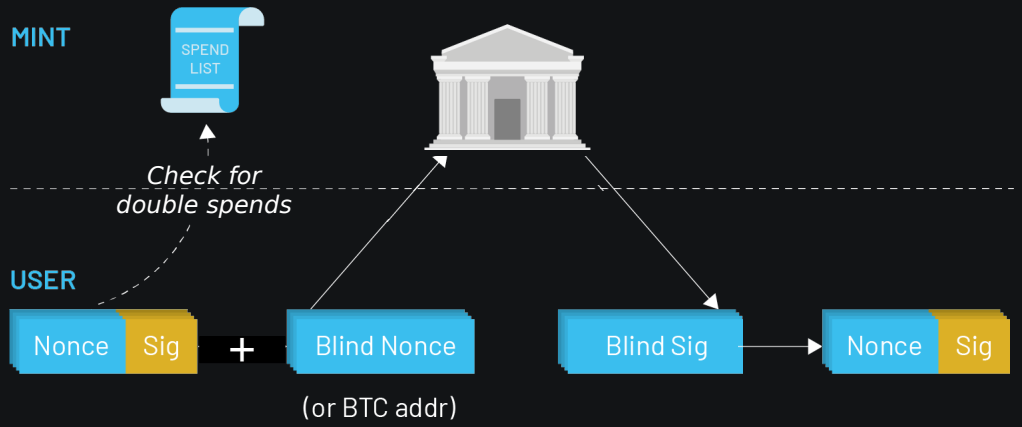
Traditional E-Cash **Spending**

4. User Creates a Redeem Receipt



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Traditional E-Cash **Pros and Cons**

Pros
• Theoretically perfect anonymity • Scalable (*)

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Federations to the rescue!

Don’t trust one party completely, but instead t of n parties to not collude.

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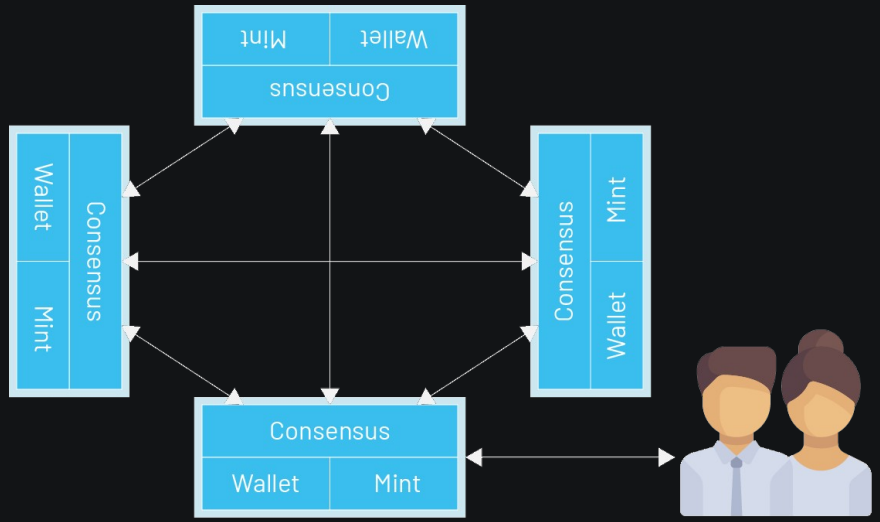
Token issuance → Threshold blind signatures

Collateral Storage → Bitcoin Multisig

2 Federated E-Cash

Federated **E-Cash**

Replicated State Machine implementing a multisig wallet and e-cash mint.



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Federated E-Cash
Pros and Cons

Pros	Cons
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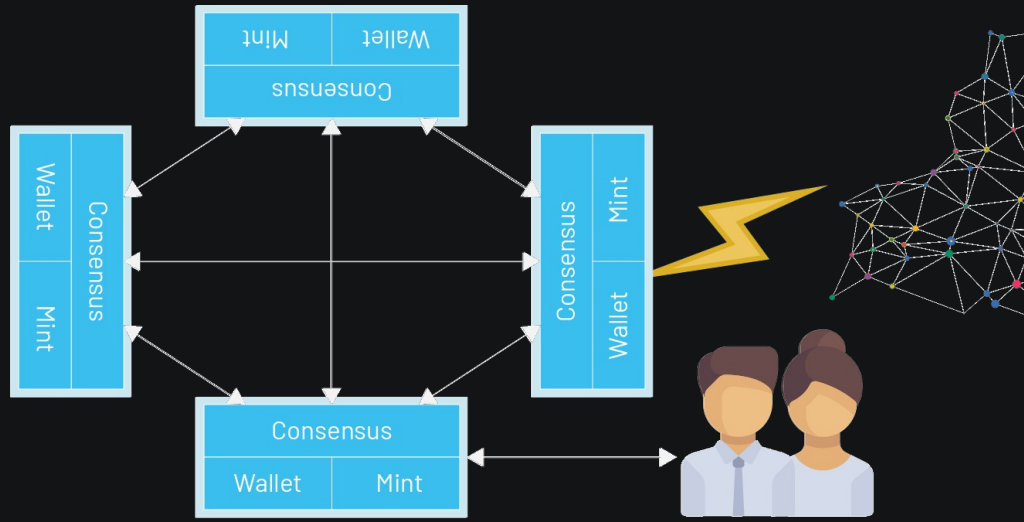
Federated E-Cash **with LN Integration**



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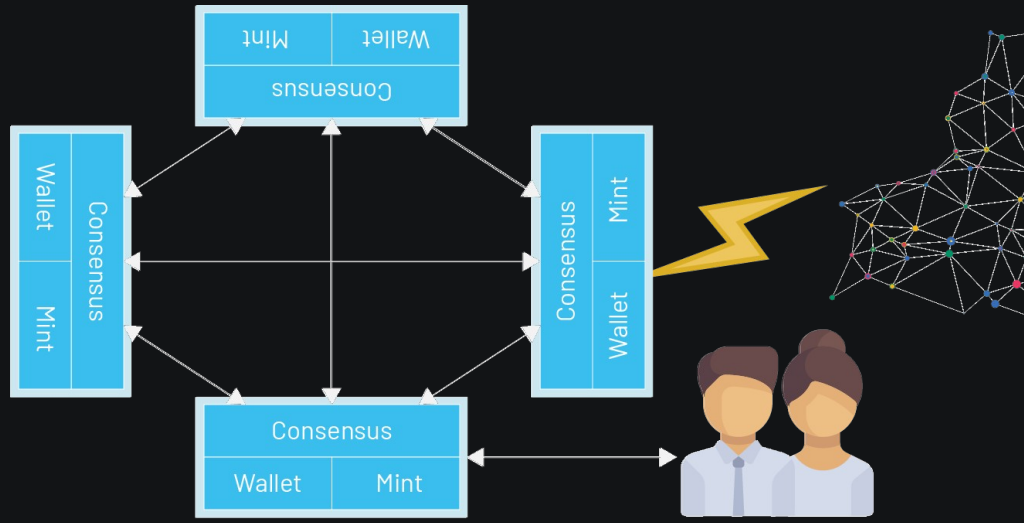
Federated E-Cash **with LN Integration**



Version 1: Fully trusted LN gateway

Version 2: HTLCs inside the federation

Version 3: Federated LN node

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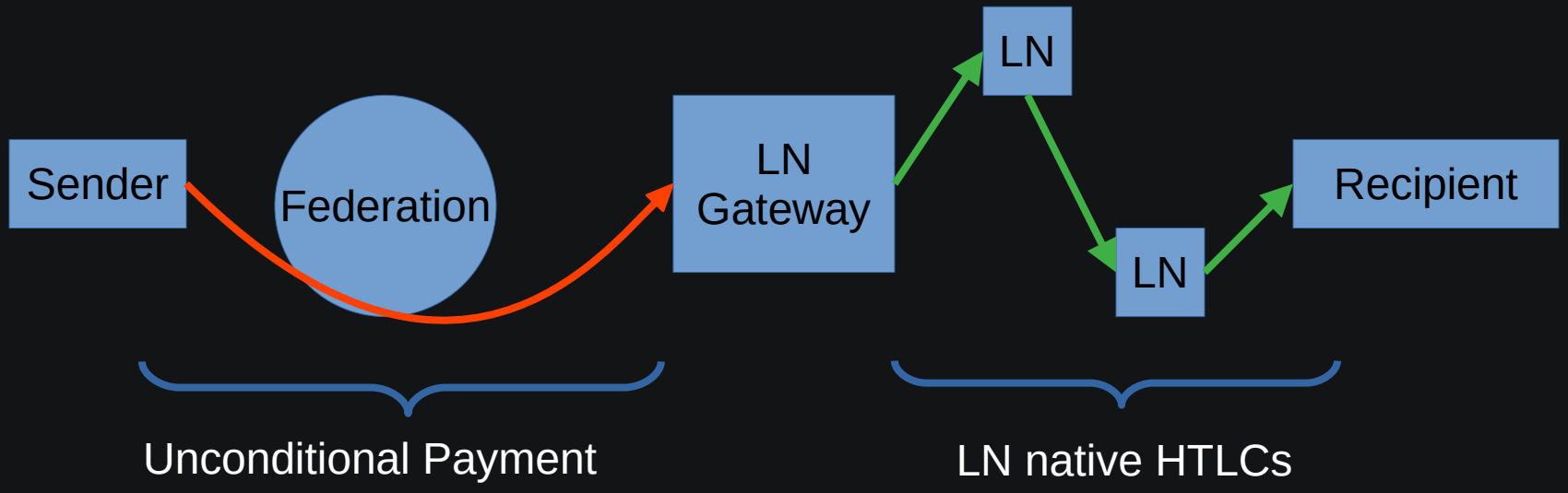
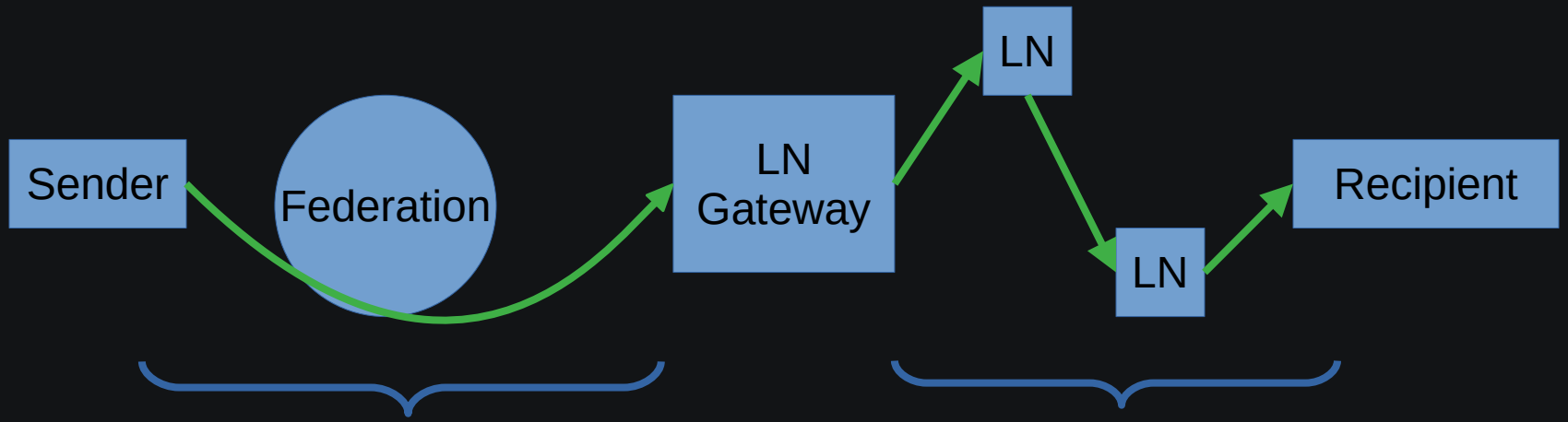
Version 1 **LN Integration:**



Version 2 **LN Integration:**

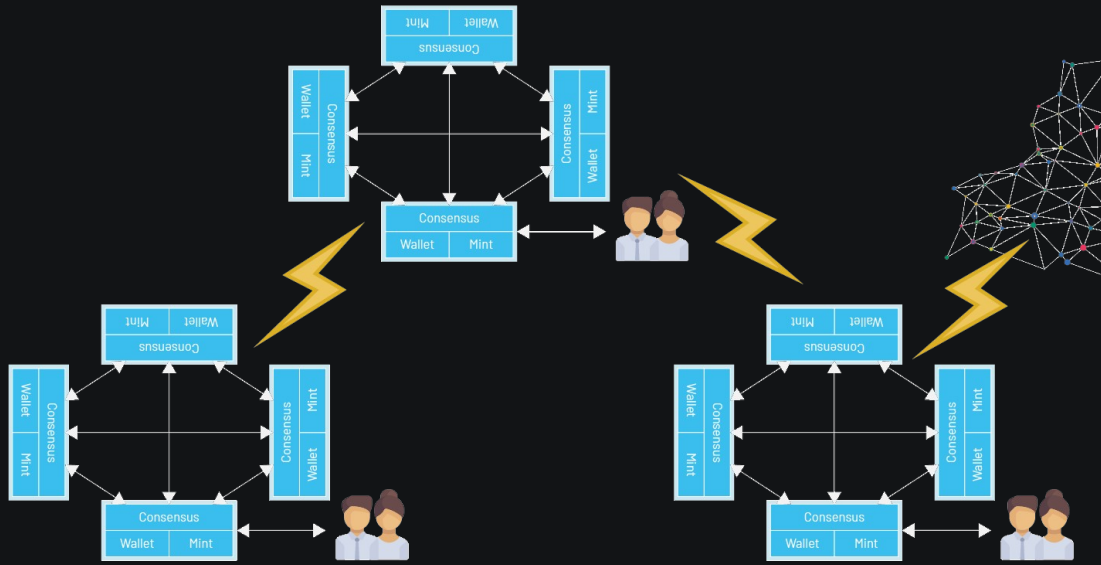


Payment if:

- Preimage is presented
- Timelock hasn’t expired

LN native HTLCs

Federation of **Federations with LN Integration**



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Federated E-Cash

- Private
- Scalable
- Trust-minimized

More at

fedimint.org

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