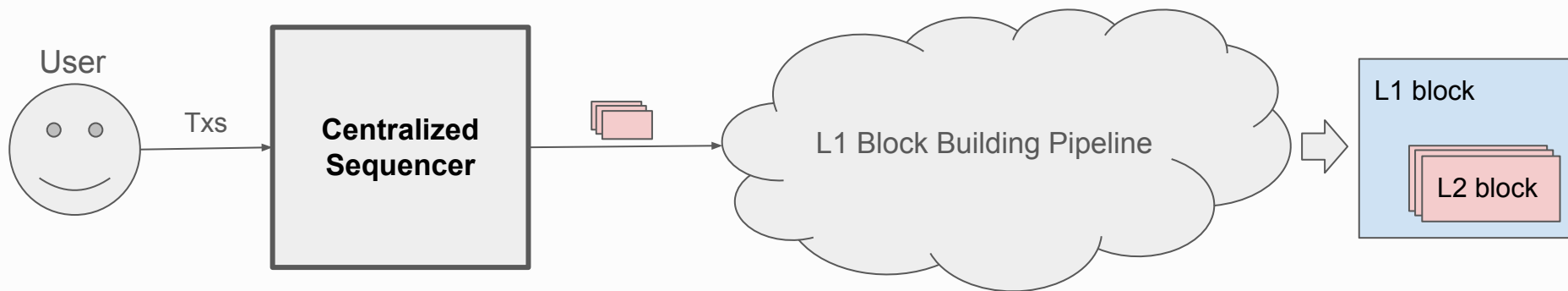


# Based Preconfirmations with MR-MEV-Boost

Lin Oshitani @linoscope  
(Nethermind Research)

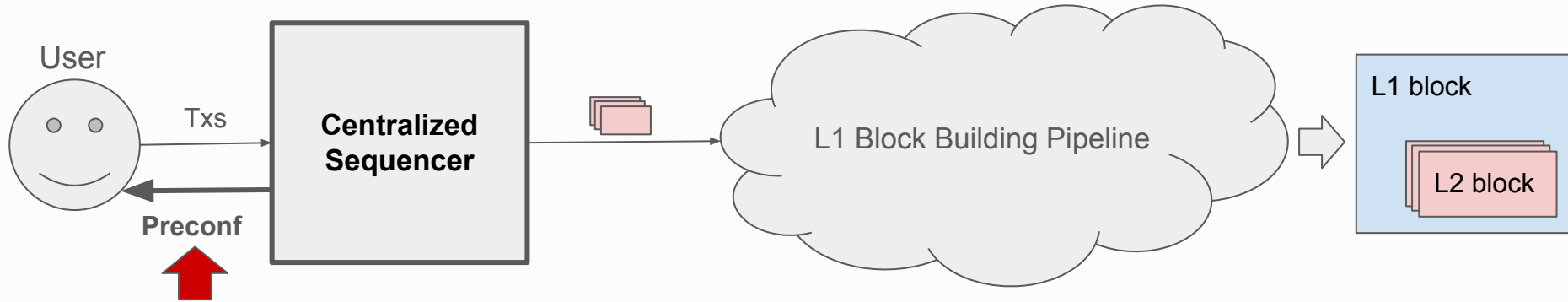
# Most Rollups Today

Most rollups today build their blocks using a **centralized sequencers**.



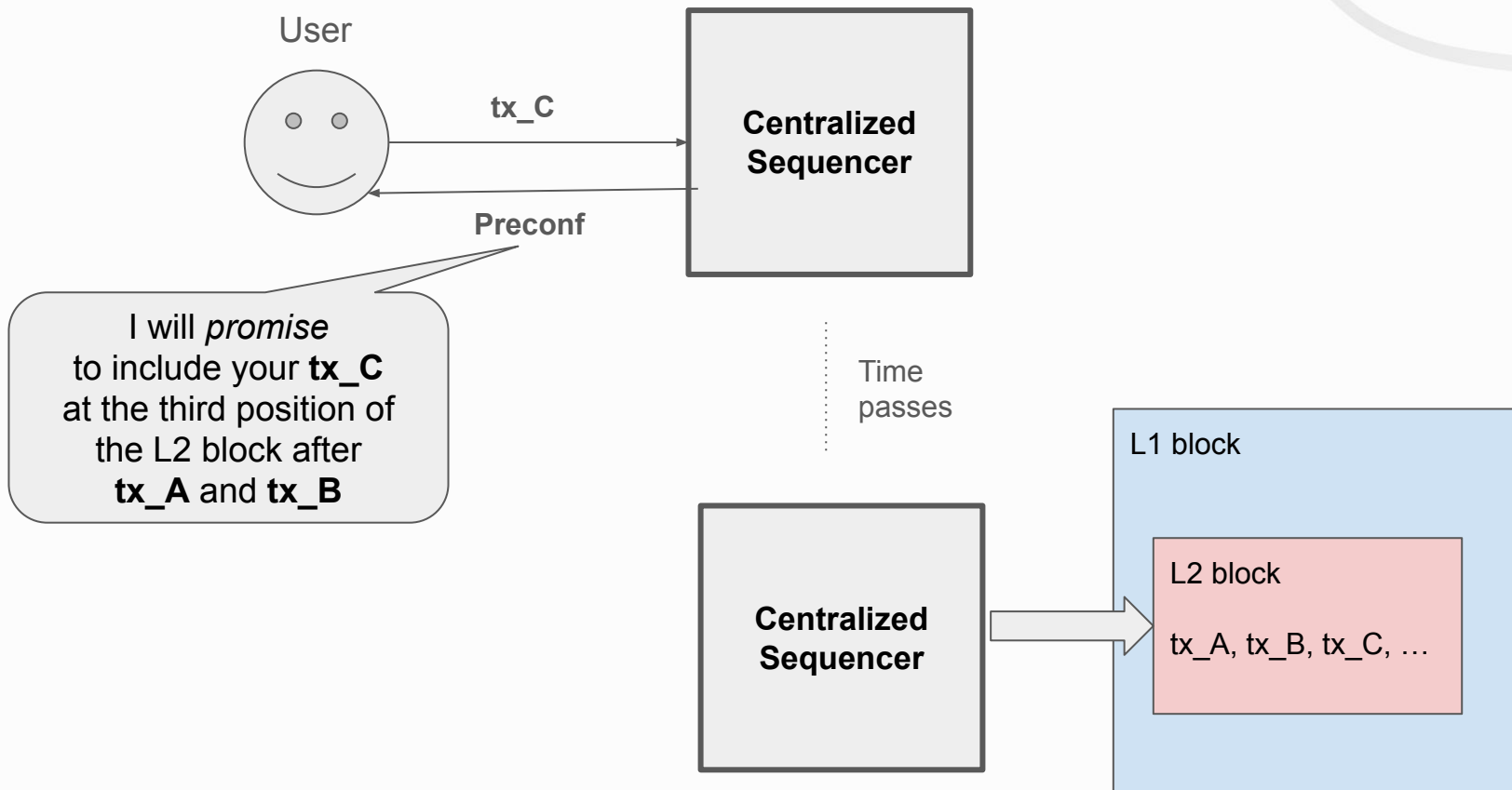
# Centralized Sequencers

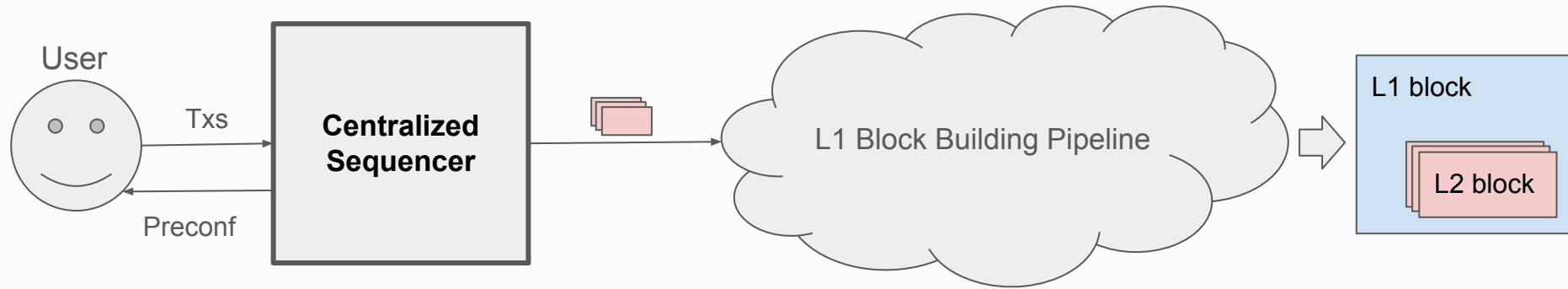
Most rollups today build their blocks using a centralized sequencers.



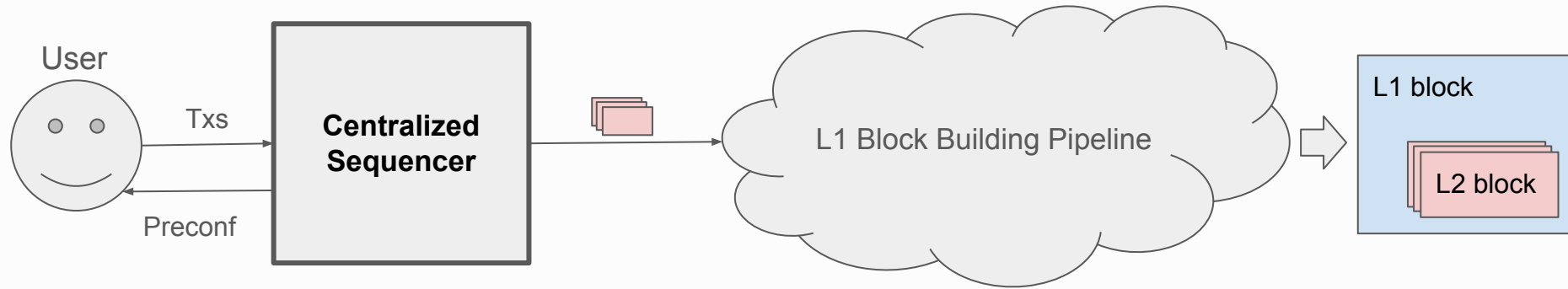
Centralized sequencers can provide ***preconfirmations (preconfs)***

# What are Preconfirmations?



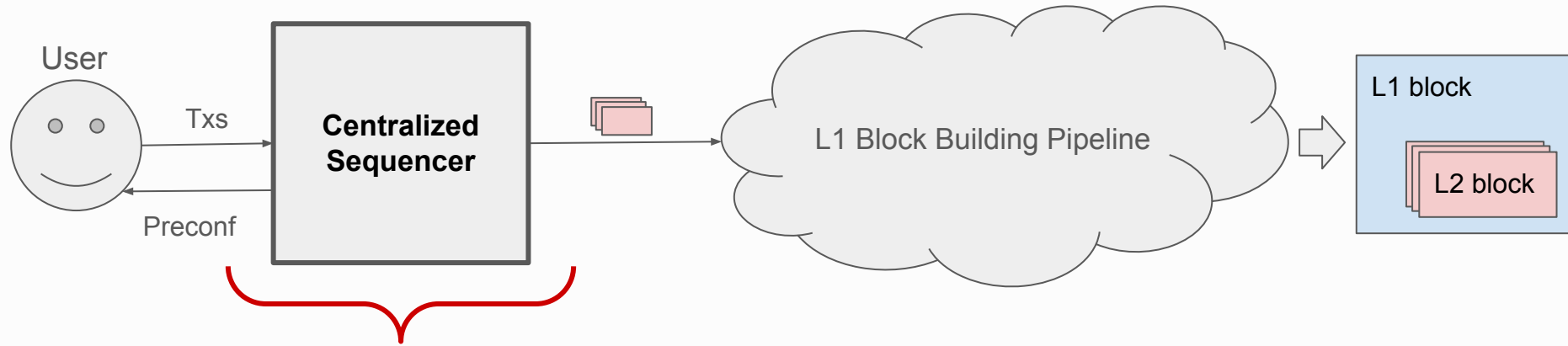


Centralized sequencers are nice! They provide fast UX.

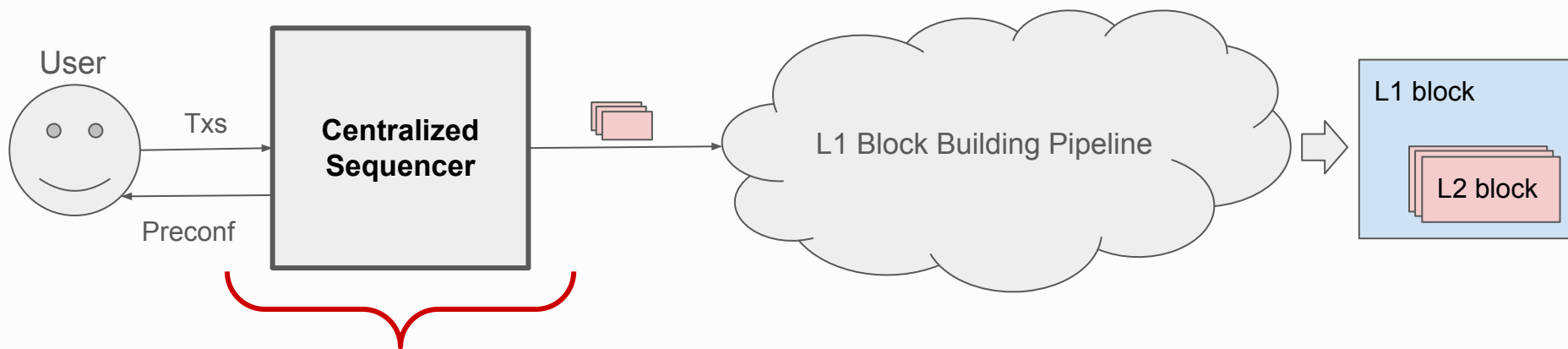


Centralized sequencers are nice! They provide fast UX.

However, they are centralized. **How do we decentralize?**



What if we **remove this “sequencer” roll entirely?**



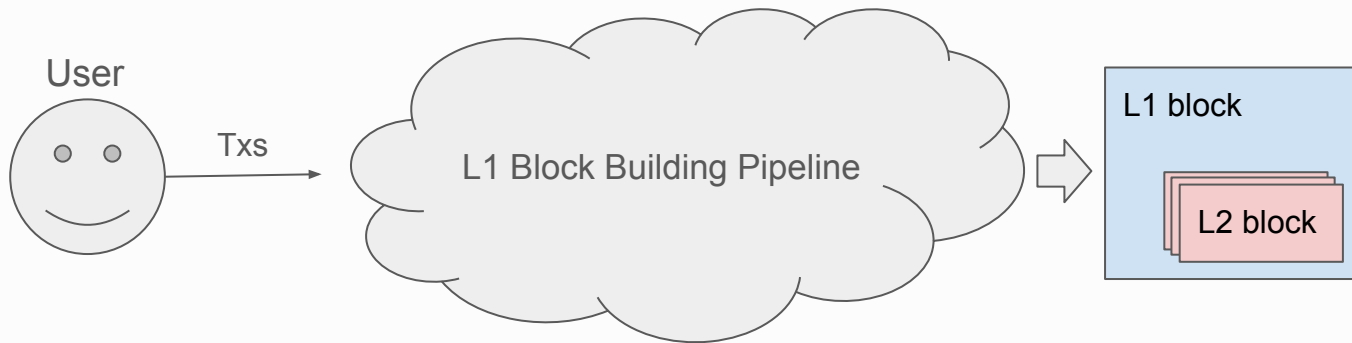
What if we remove this “sequencer” roll entirely?

➡ **Based Rollups**



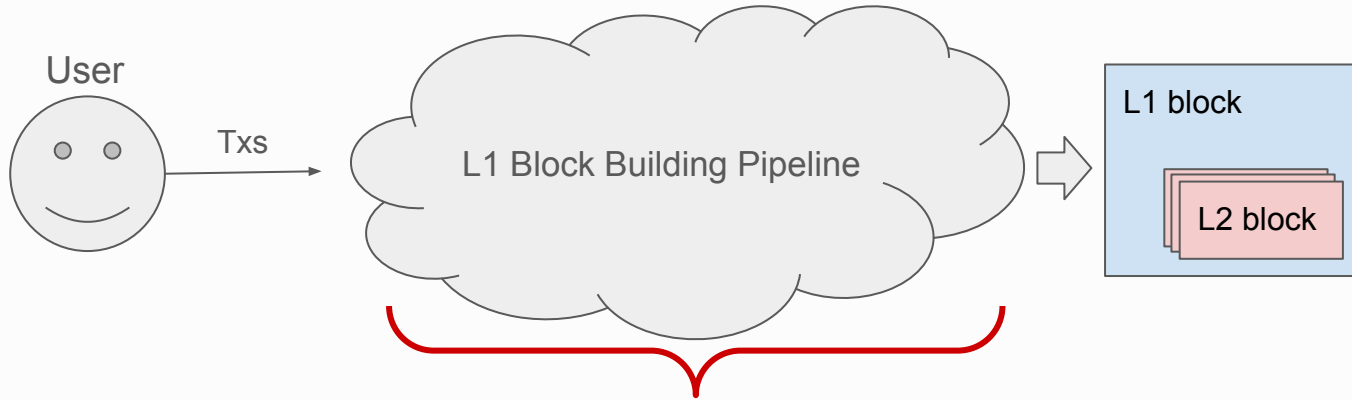
# Based Rollup

Idea: Use **L1 block building pipeline** to sequence **not only L1 txs** but **also L2 txs**



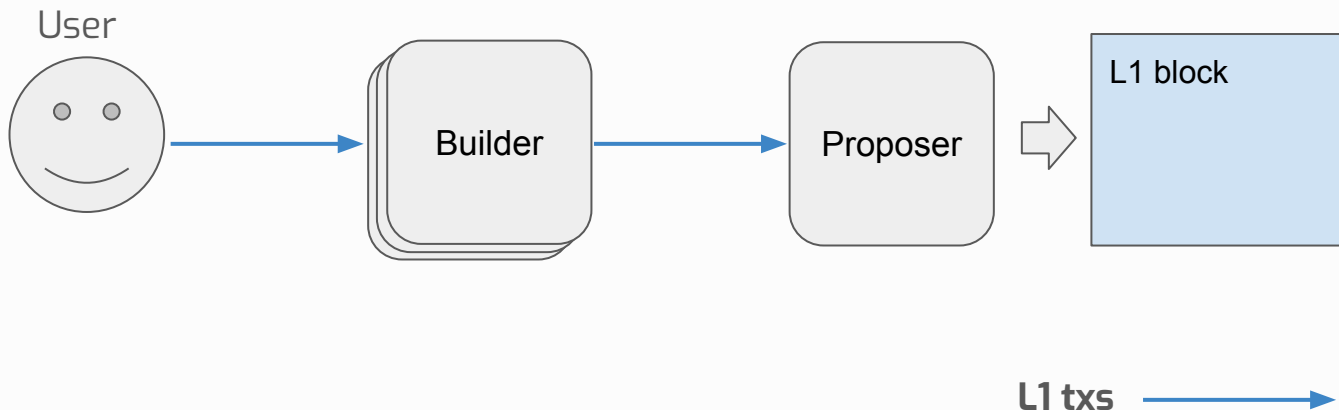
# Based Rollup

Idea: Use L1 block building pipeline to sequence not only L1 txs but also L2 txs

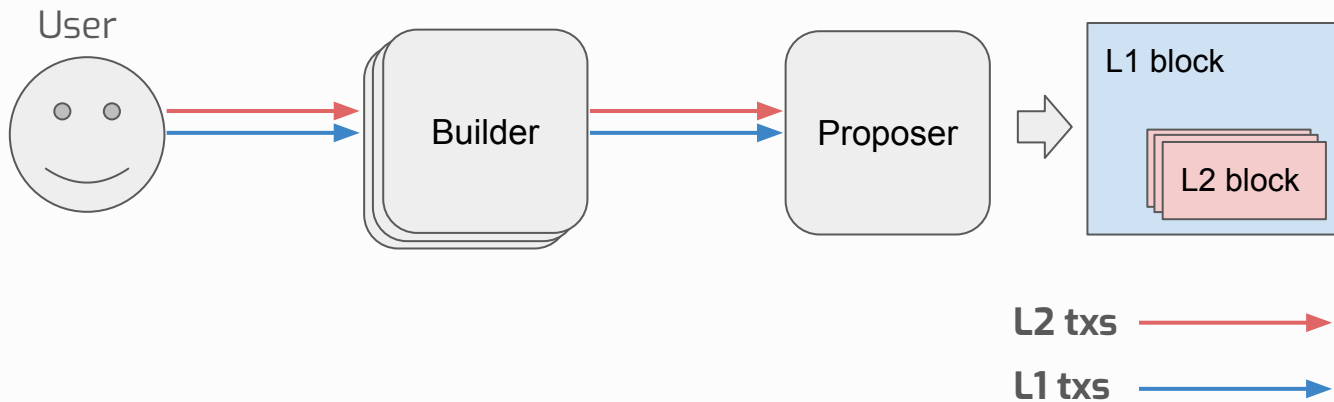


Let's expand this “**L1 block building pipeline**” part.

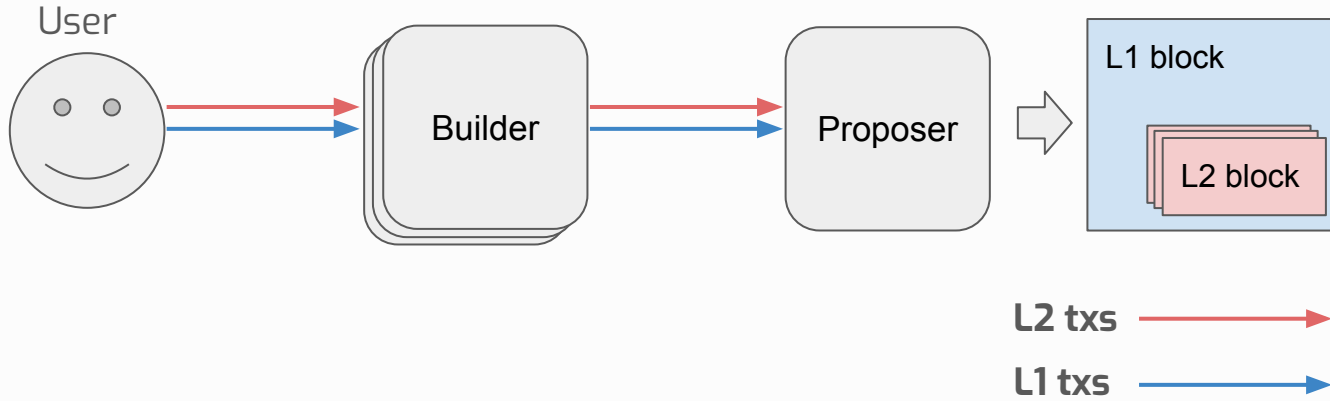
# Block Building Pipeline



# Based Rollups



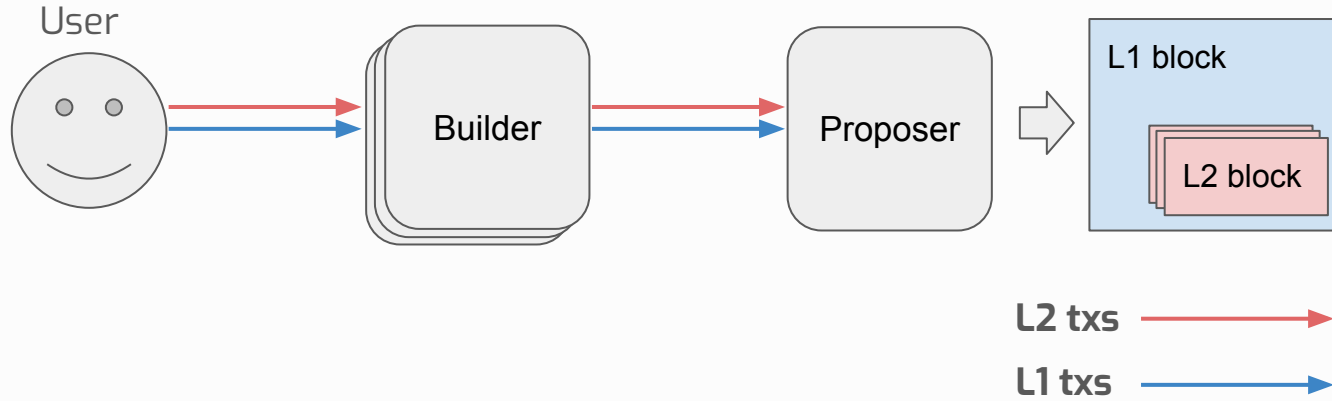
# Based Rollups



Based Rollups age great!

- Inherit L1 censorship resistance and liveness.
- Enables L1 composability

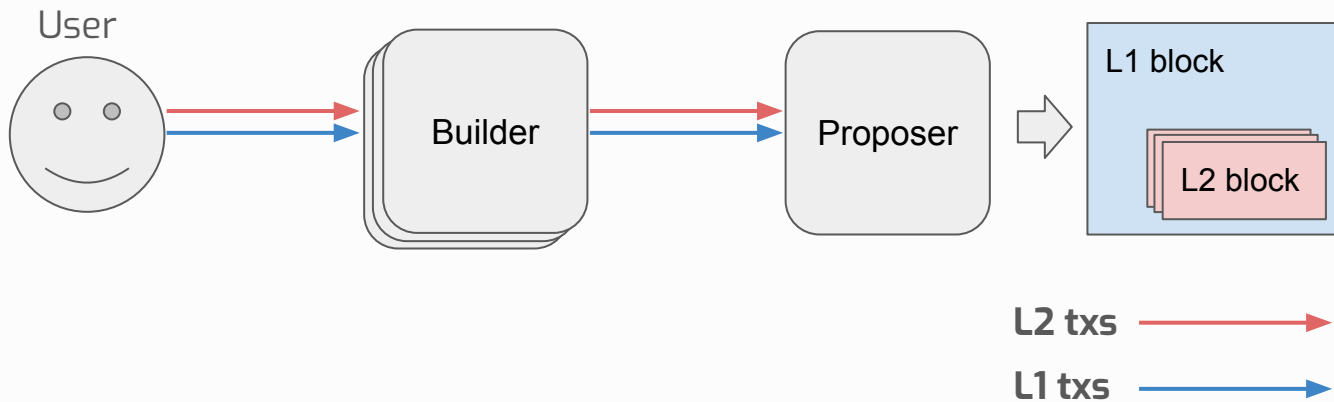
# Based Rollups



Problem:

Based rollups are slow! No preconfs!

# Based Rollups



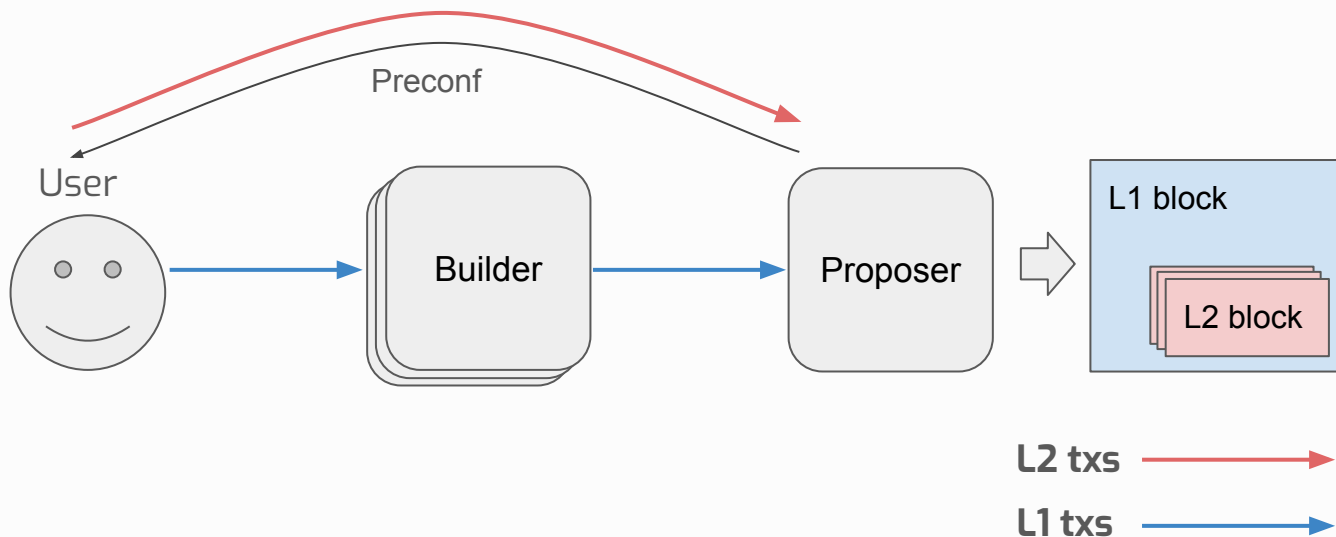
Problem:

Based rollups are slow! No preconfs!

➡ **Based Preconfirmations**

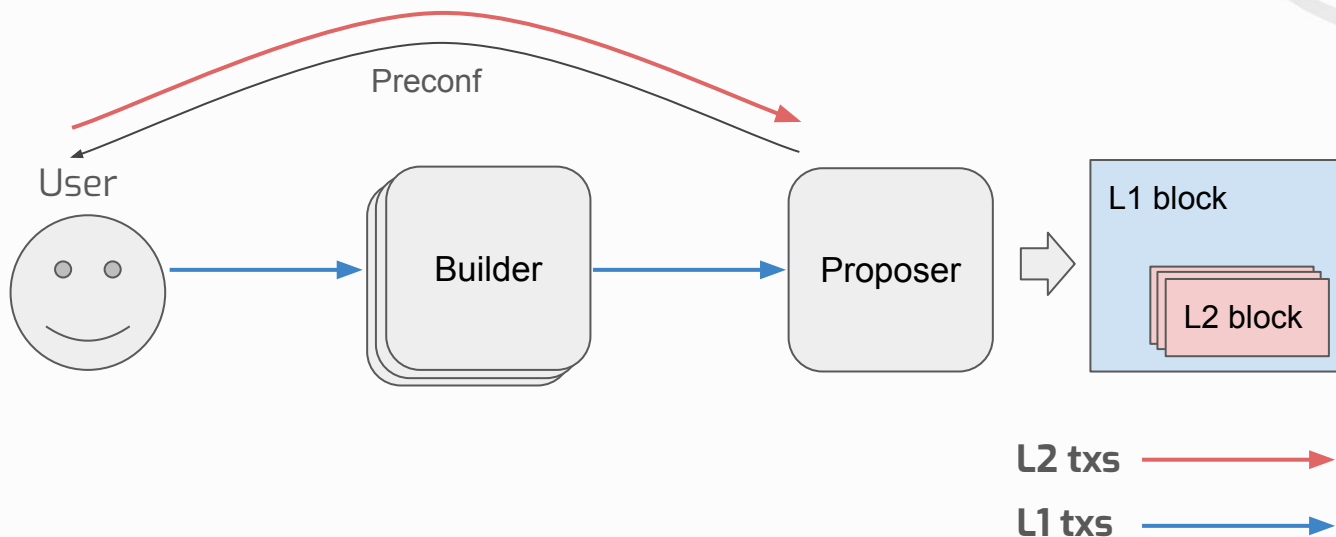
# Based Preconfirmations [Justin Drake 2023]

Idea: **L1 proposers** can opt to provide preconfirmations during their slot.



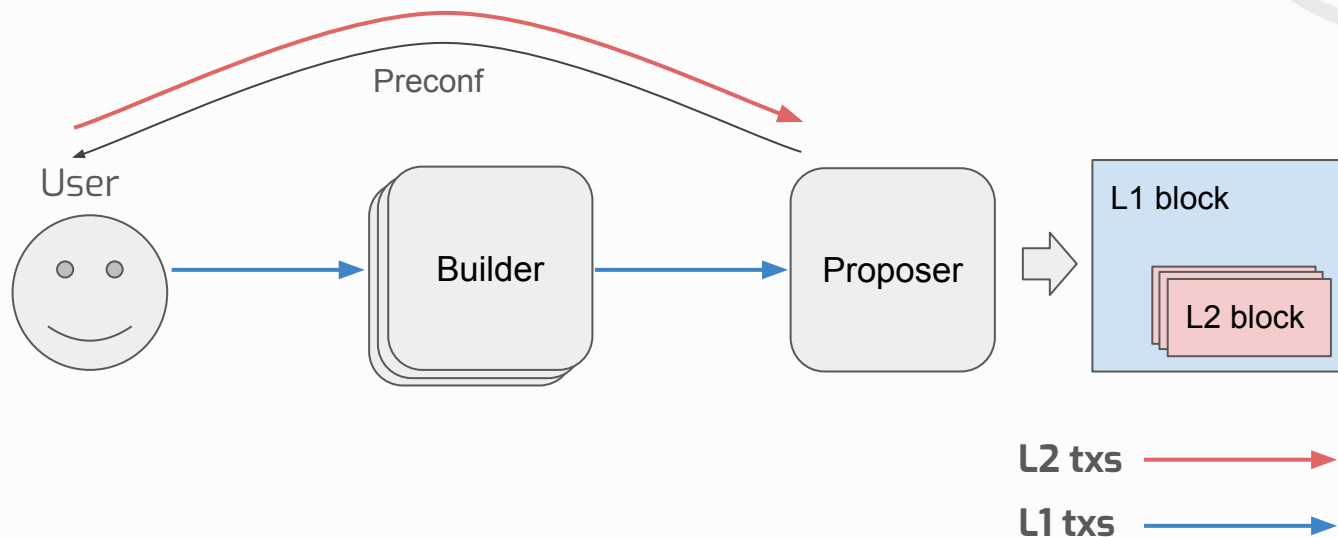


# Based Preconfirmations (Justin Drake 2023)



Observation: Providing preconfirms require sophistication

# Based Preconfirmations [Justin Drake 2023]

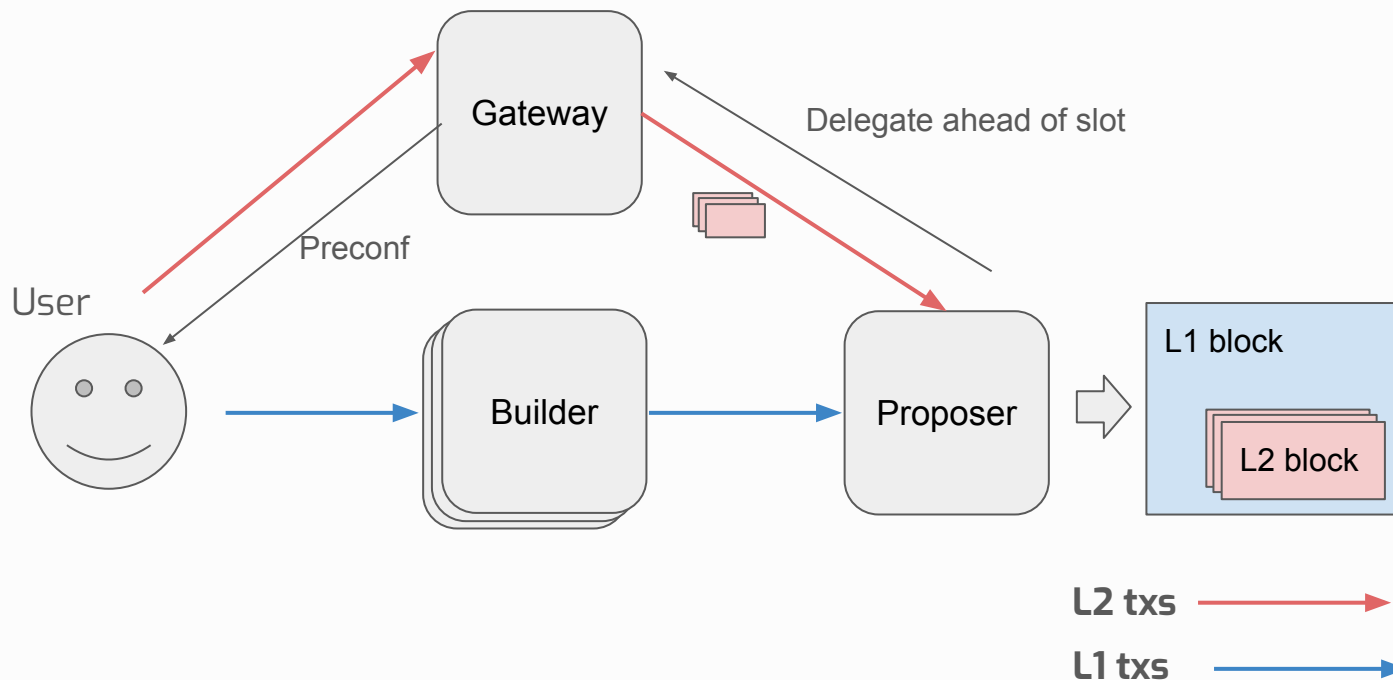


Observation: Providing preconfns require sophistication

➡ Delegation to **Gateways**

# Gateways

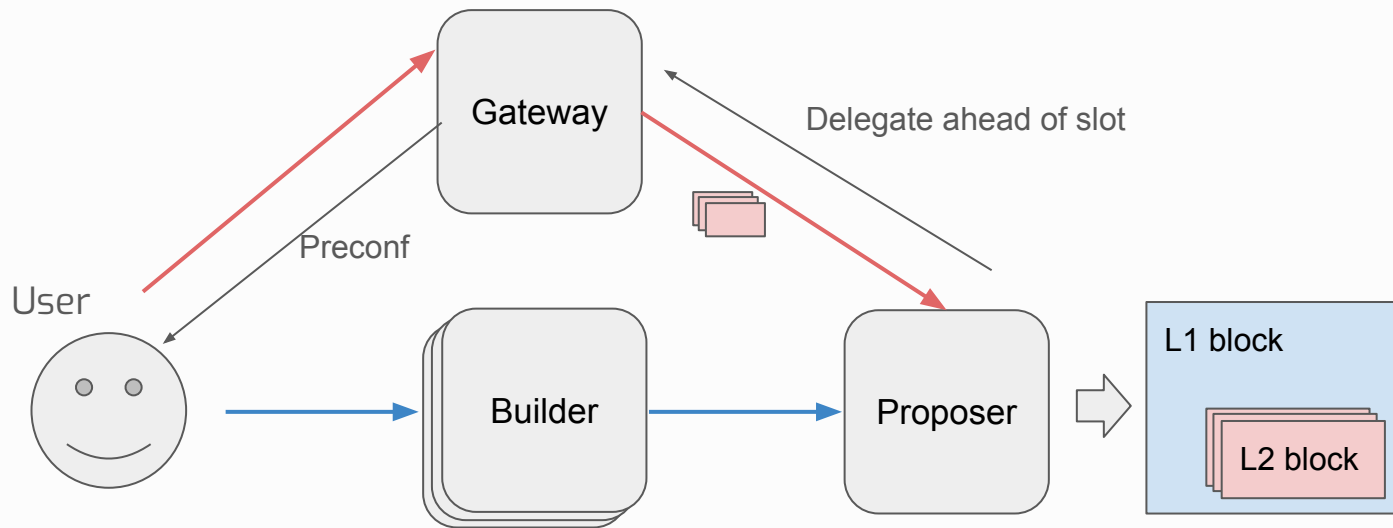
Idea: **Proposer delegates preconf duties to *gateways* ahead of their slot**



# Gateways

Problem:

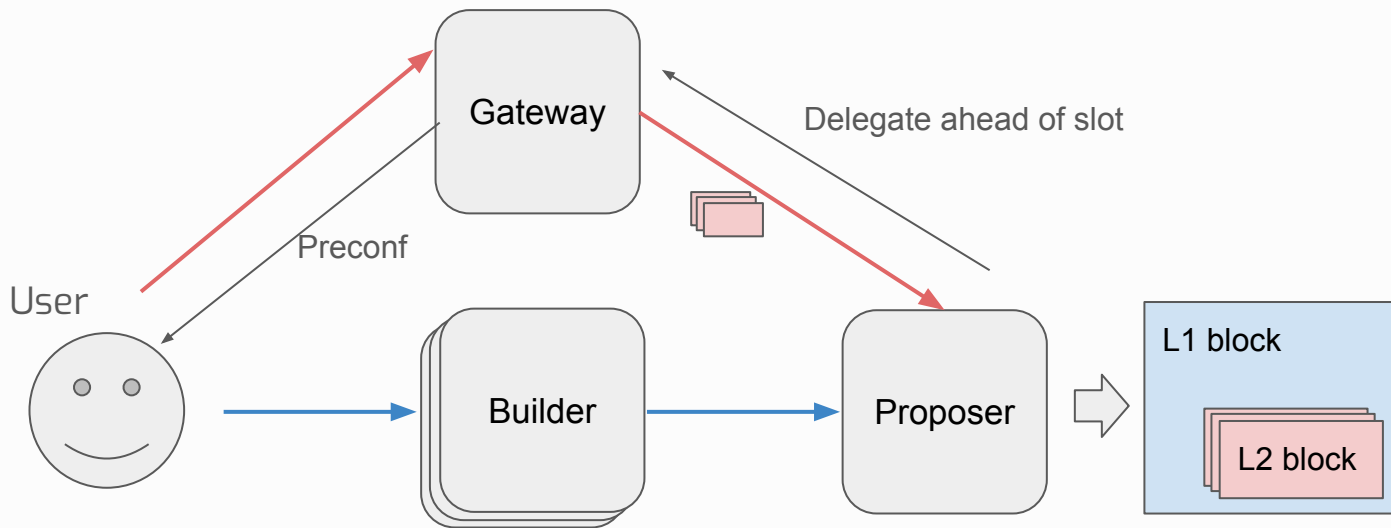
- Inheritance of L1 censorship resistance and liveness is degraded.
- L1 composability is more complicated



# Gateways

Question:

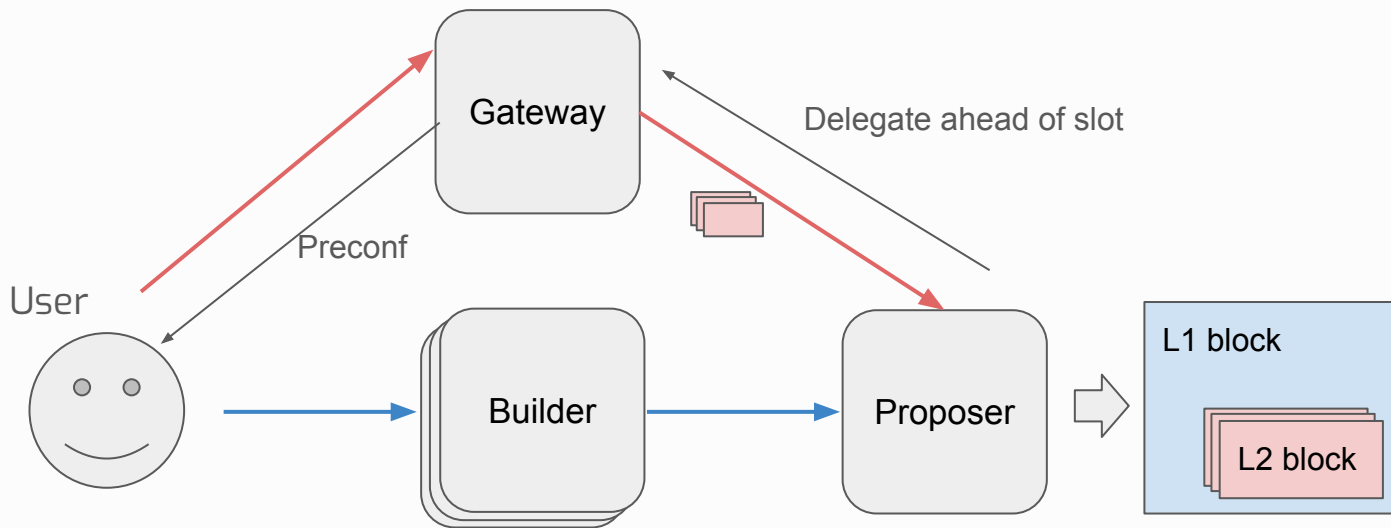
Can we introduce based preconfirmation while retaining the good properties of based rollups?



# Gateways

Question:

Can we introduce based preconfirmation while retaining the good properties of based rollups? ➡ **MR-MEV-Boost**

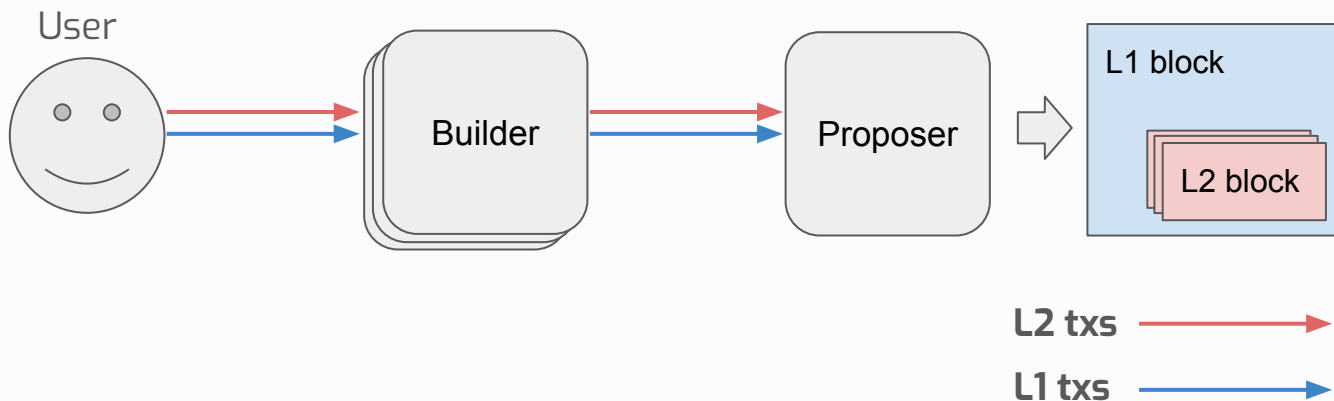


# Multi-round MEV-Boost (MR-MEV-Boost)



Idea:

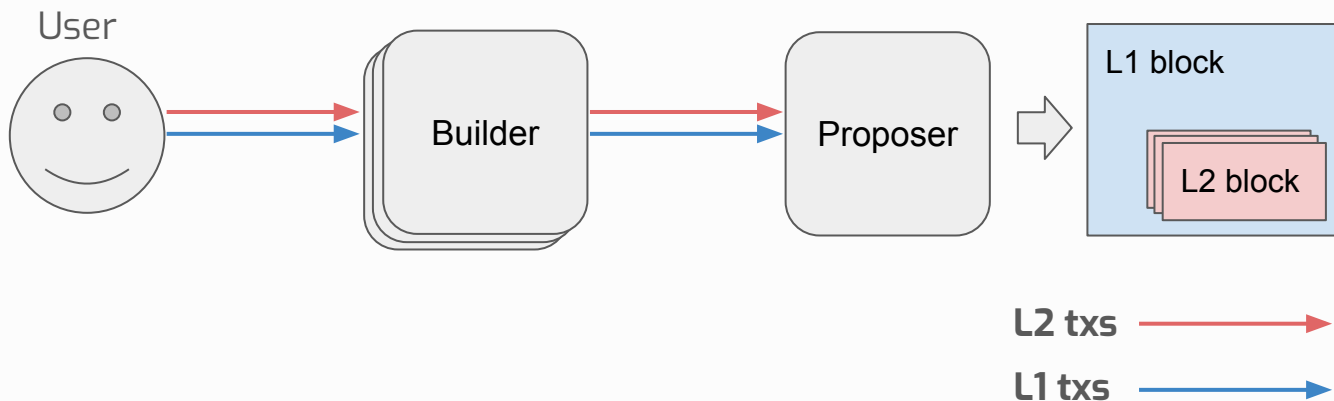
Split slots into multiple sub-slots, a.k.a, “rounds”. In each round run a MEV-Boost auction to preconfirm a “partial block”.





No additional entity is added to the pipeline. As a result:

- Inherits L1 CR/liveness.
- Enables L1 composability





NETHERMIND  
**RESEARCH**

Lin Oshitani  
@linoscope