

# 4 Dimensional Blockchain Scaling with Cosmos and Tendermint

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# AGENDA

INTRODUCTION TO SCALING / INTEROPERABILITY

SCALING / INTEROPERABILITY

SECURITY MODELS

RECAP

## GOALS

1

### UNDERSTAND THE DIFFERENT SCALING APPROACHES

- Consensus Scaling:  
Using Tendermint Consensus
- State Machine Scaling:  
Cosmos-Sdk || Ethermint
- Interchain Scaling:  
IBC || Peggy
- Social Scaling:  
Governance || Developers

2

### KNOW THE AVAILABLE SECURITY MODELS

- Sovereign
- Hosted
- Plasma

3

### SCALING IS EVERYONE'S RESPONSIBILITY

- You have to be an  
Optimistic Planer
- Don't wait for someone  
else
- Actively look for design  
patterns that allow you to  
build scalable dApps



## INTRODUCTION TO SCALING AND INTEROPERABILITY

### SCALING

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- Throughput
- Competition for the same compute resources

### INTEROPERABILITY

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- Many heterogeneous chains
- Central synchronization points
- Access to liquidity

# SCALING

CONSENSUS SCALING

STATE MACHINE SCALING

INTERCHAIN SCALING

SOCIAL SCALING

## CONSENSUS SCALING

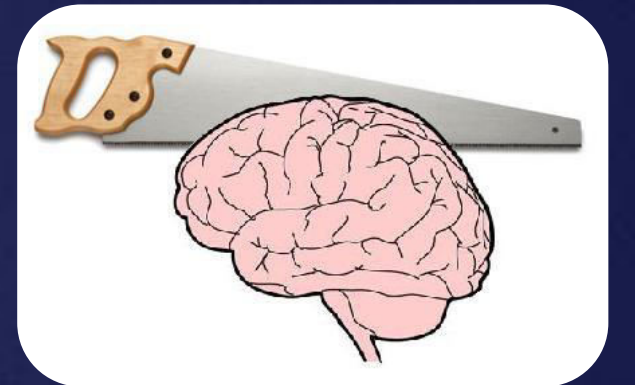
### Nakamoto Consensus

Validation

Propagation + Mining

Validation

Propagation + Mining



### BFT Consensus

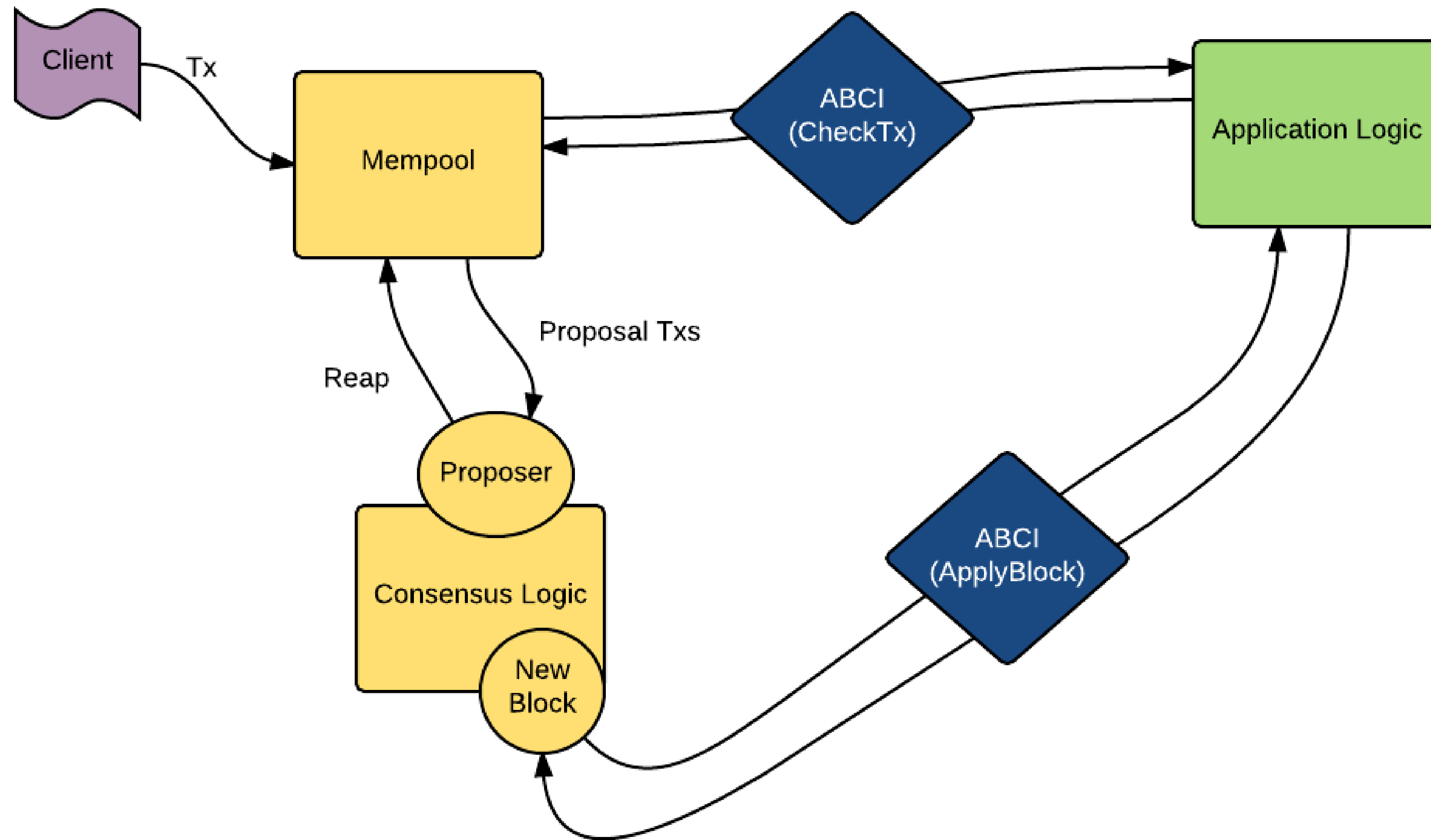
Validation

Propagation

Validation

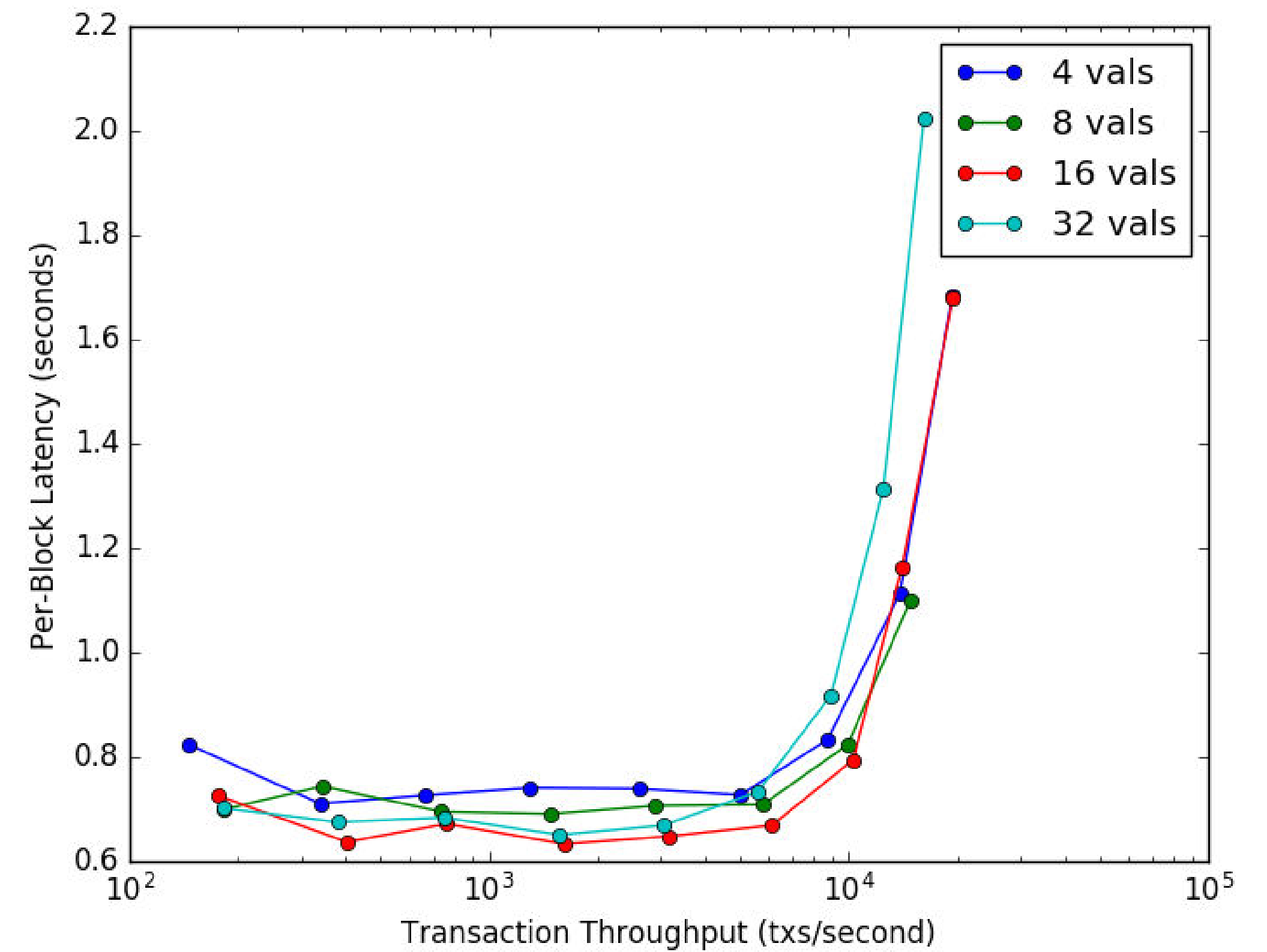
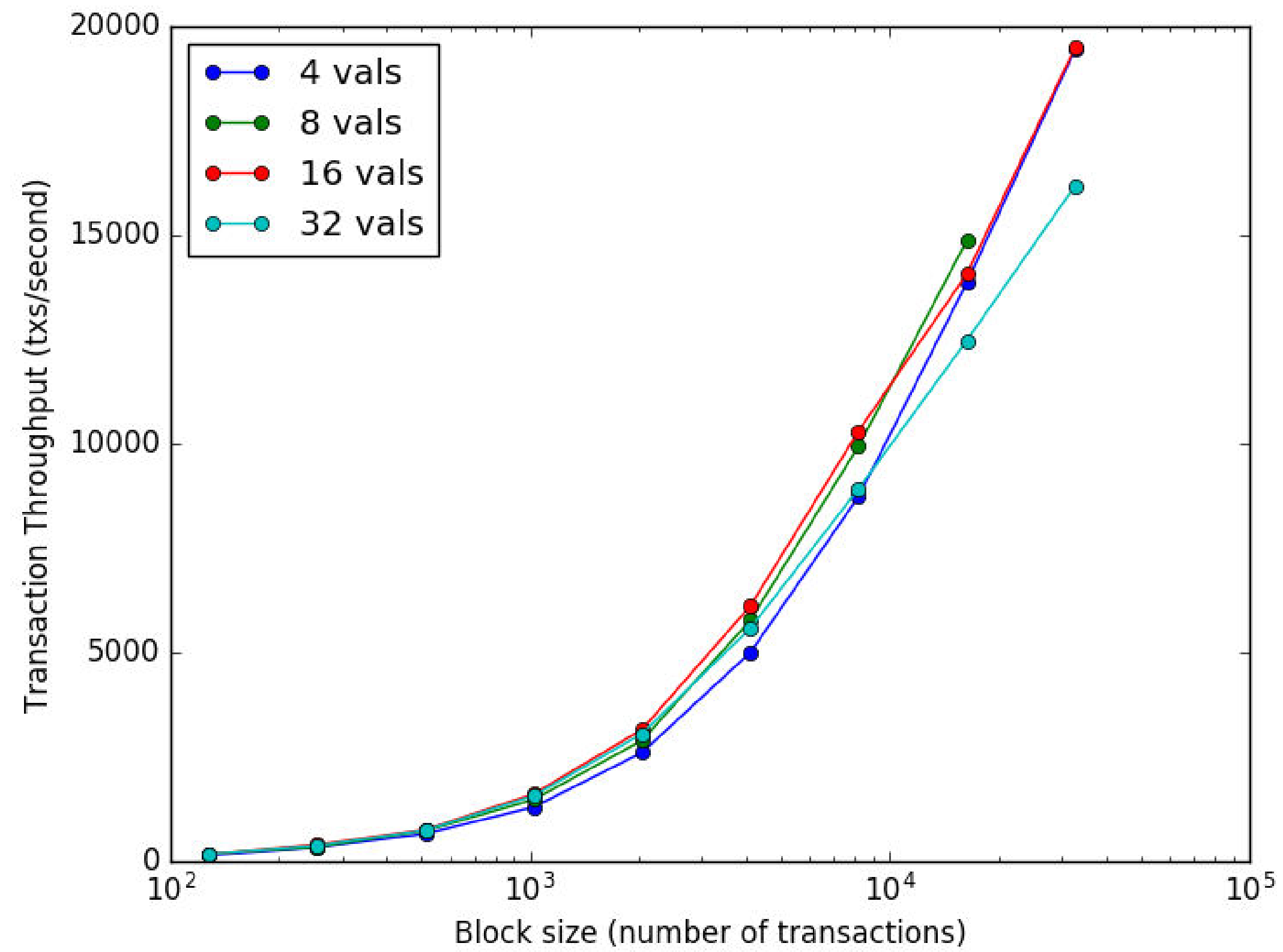
Propagation

## CONSENSUS SCALING





## CONSENSUS SCALING





## CONSENSUS SCALING

### Current

- Instant Finality
- Efficient light-client proofs
- Safety in asynchronous networks
- Liveness in partially synchronous networks
- 4,000 tps on 64 validators
- High network overhead -  $O(N^2)$

### Future Improvements

- BLS signatures
- Optimistic pipelining
- DKG construction
- Liveness through synchrony assumption

## STATE MACHINE SCALING

ETHERMINT

COSMOS-SDK

## INTERCHAIN SCALING

### IBC

- Secure transfers between heterogeneous blockchains
- Tokens -> NFTs -> Complex Objects

### IBC + Adaptors

- Adapter to enforce finality
- Allows IBC connections to non-finality chains

### Cosmos Hub

- Liquidity provider for all connected blockchains
- Maintains double-spend protection between blockchains





## SOCIAL SCALING

### Development

- Increasing adoption
- Security of your codebase
- Working with a large group of people

### Governance

- Evolving the protocol
- Ability to govern the network



## SECURITY MODELS

SOVEREIGN

HOSTED

PLASMA

## RECAP

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CALL TO ACTION

Scaling is **Everyone's** Responsibility!

Don't just wait for someone else to solve it for  
you!



# Any Questions?

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