Bitcoin's Technical Challenges

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Bitcoin Basics

Bitcoin Basics

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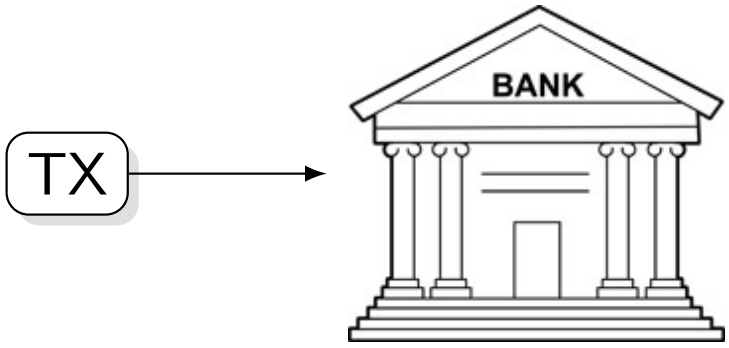
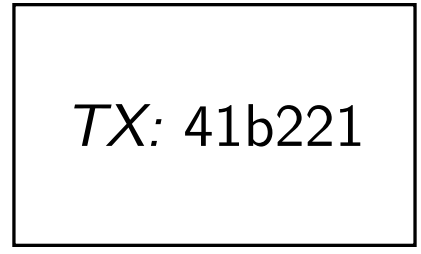
User	Balance
A	2
B	5
C	8

Bitcoin Basics

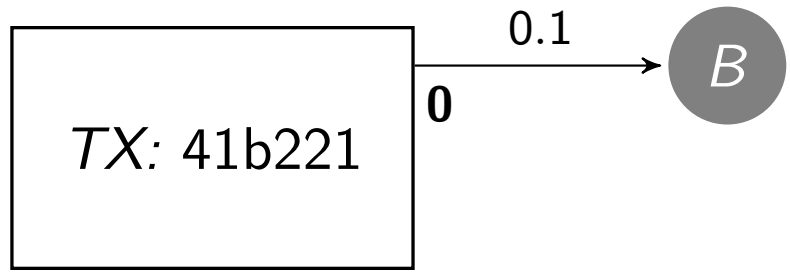


User	Balance
A	~~2~~ 4
B	~~5~~ 3
C	8

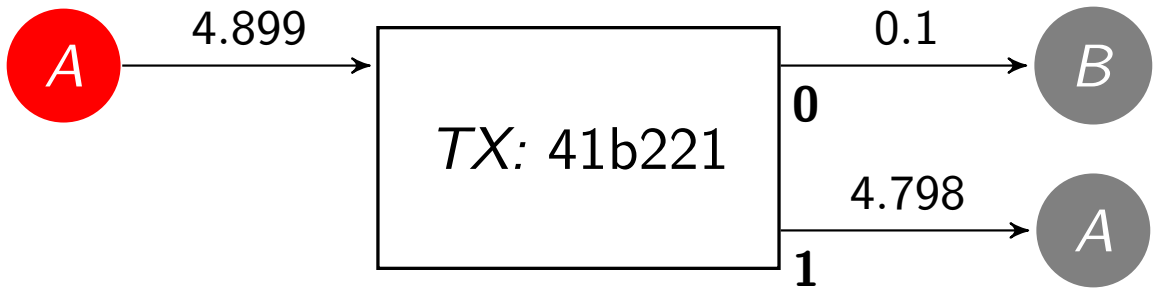
Transferring Bitcoins



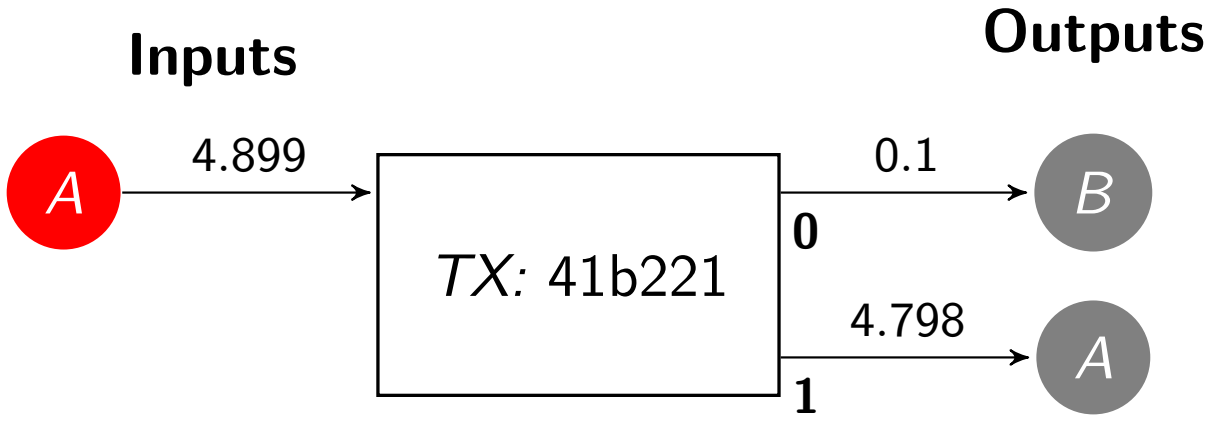
Transferring Bitcoins



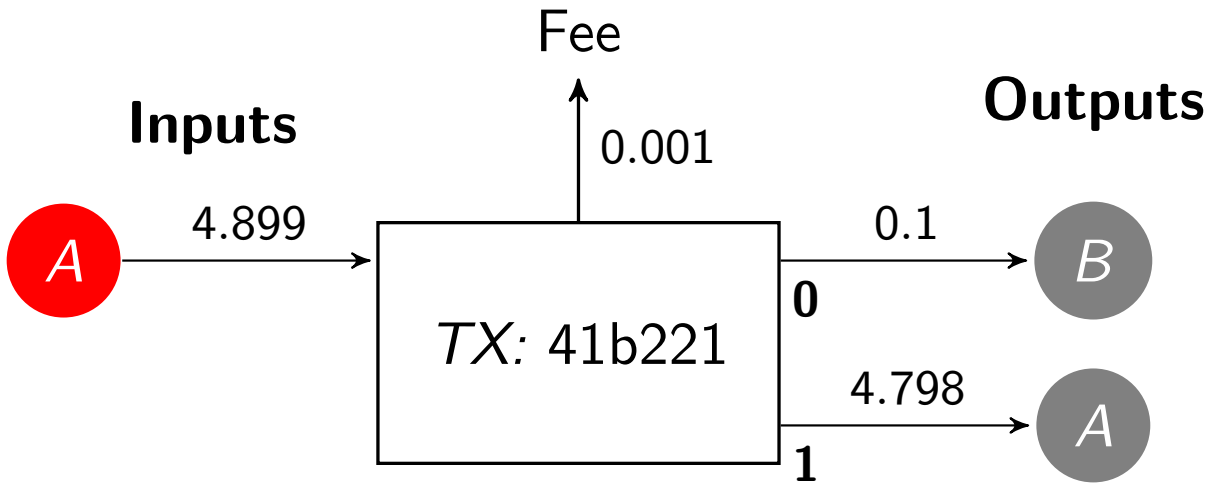
Transferring Bitcoins



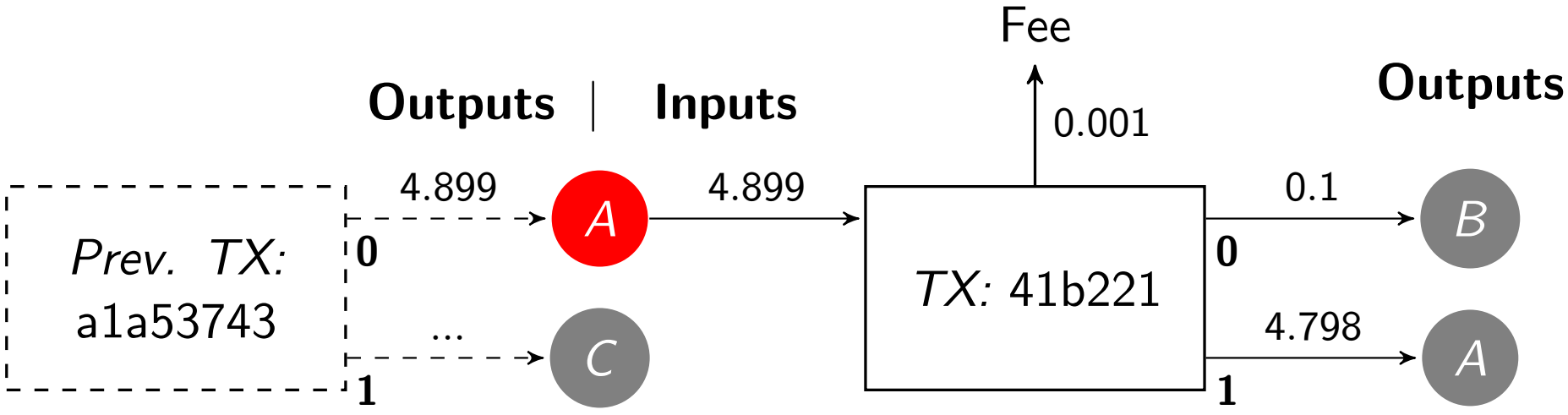
Transferring Bitcoins



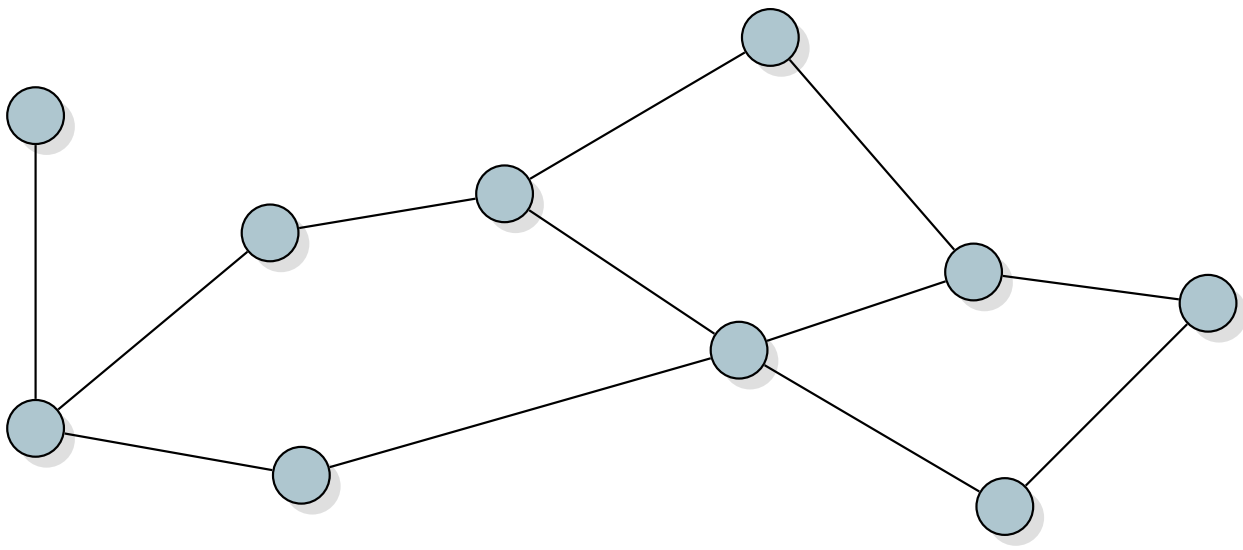
Transferring Bitcoins



Transferring Bitcoins



Distributing the Bank



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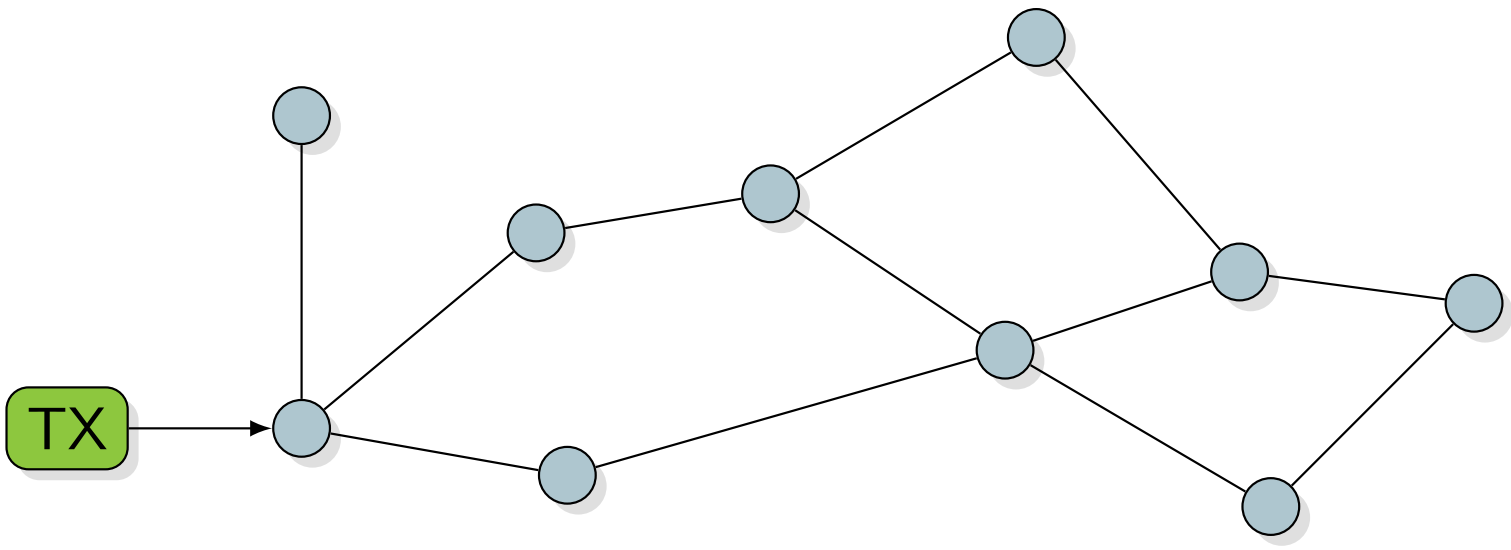

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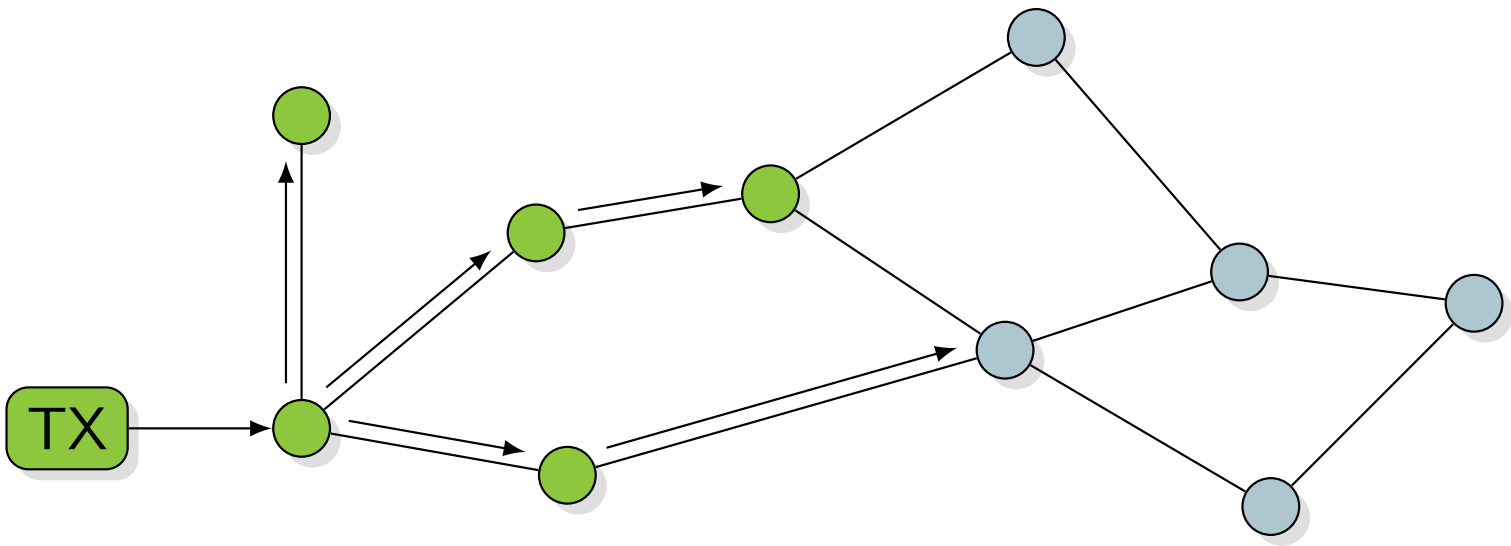

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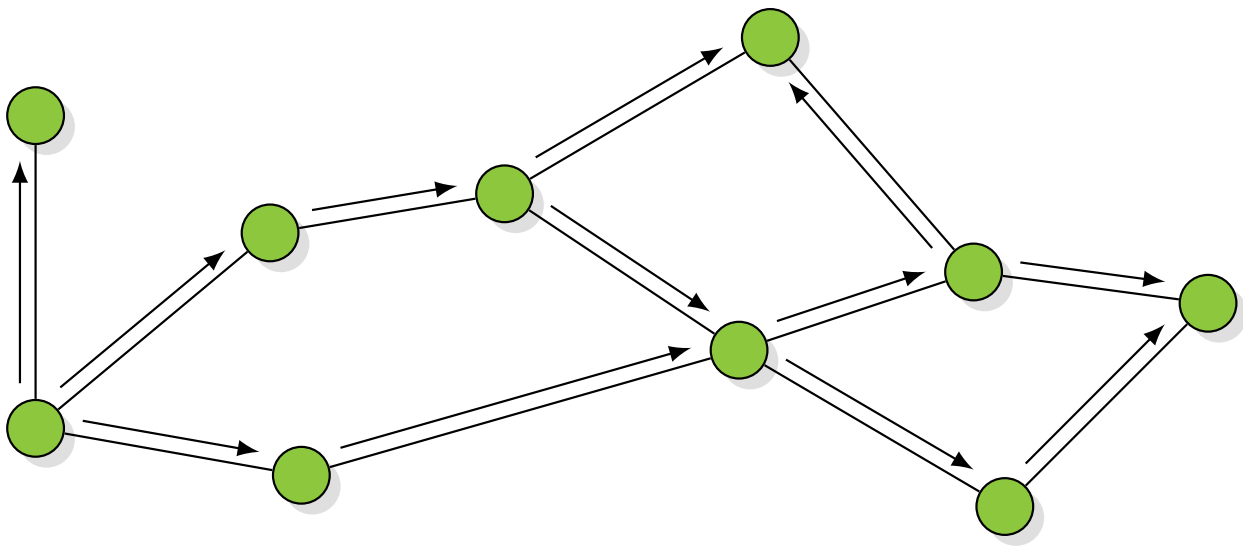

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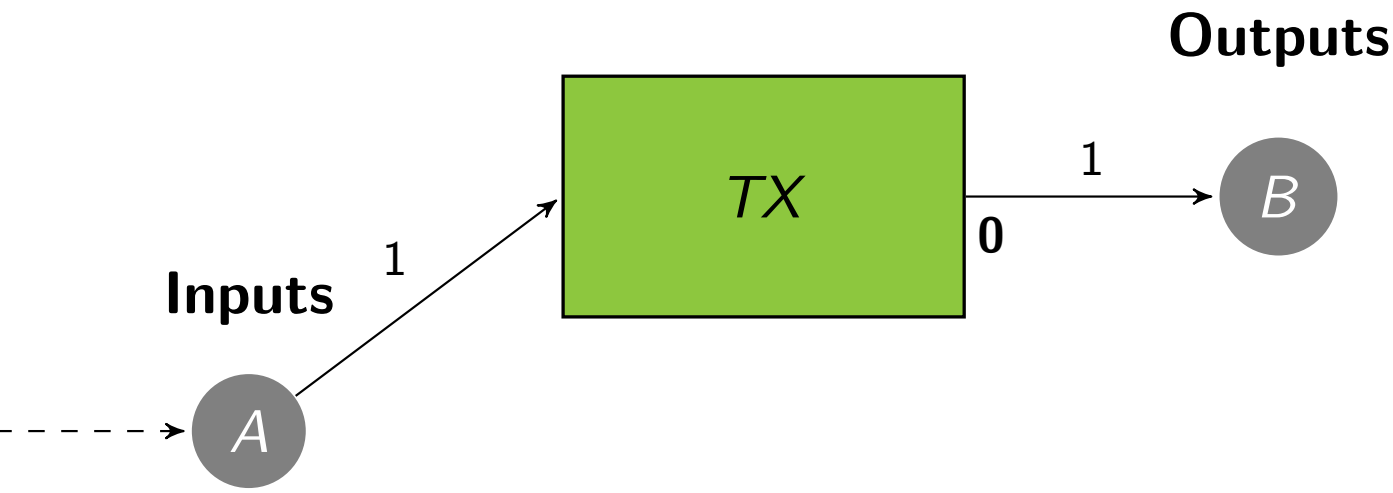

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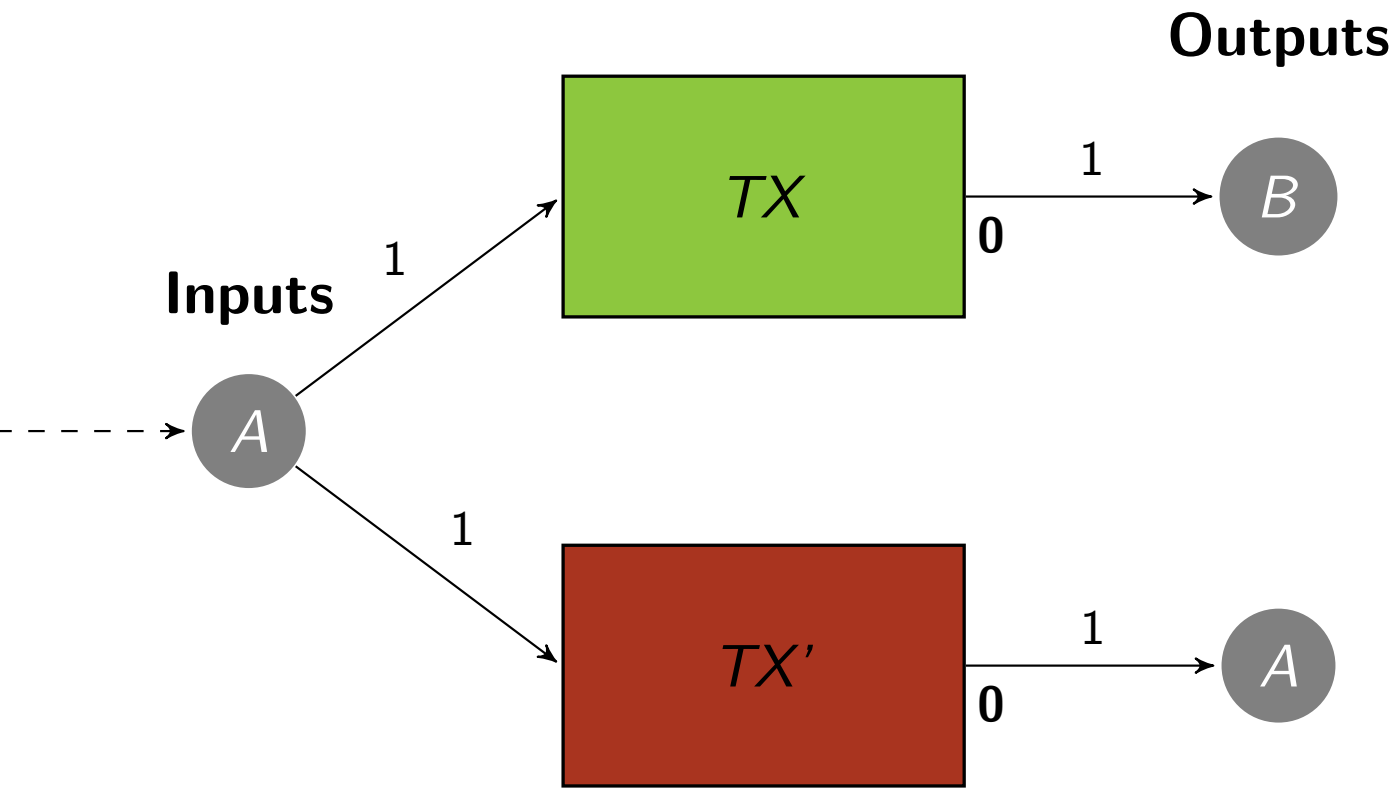

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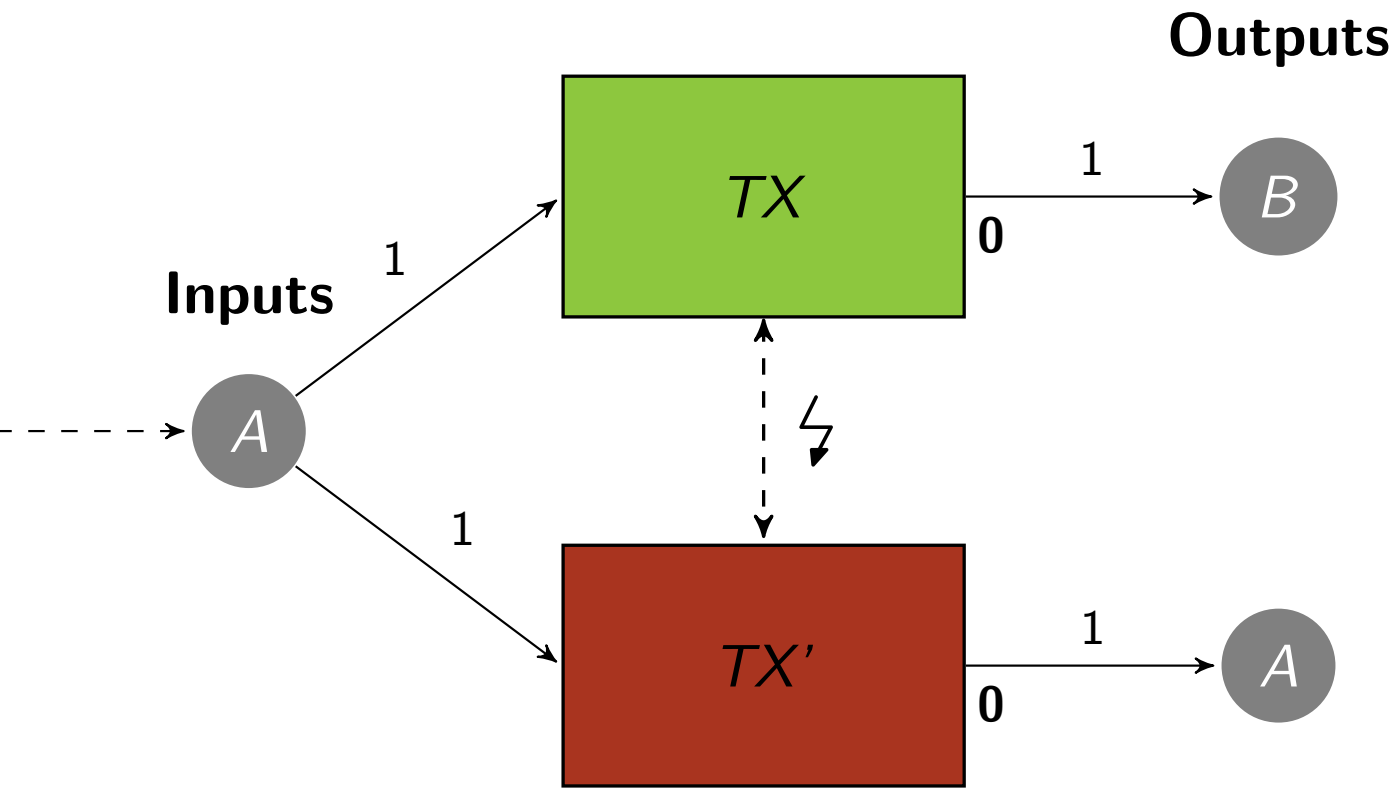
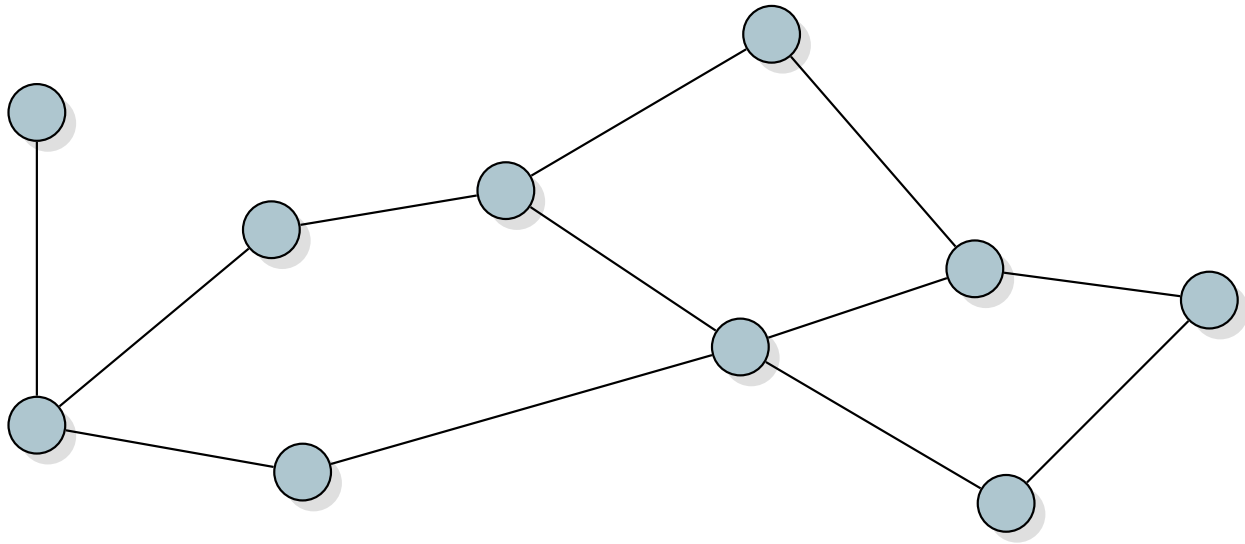
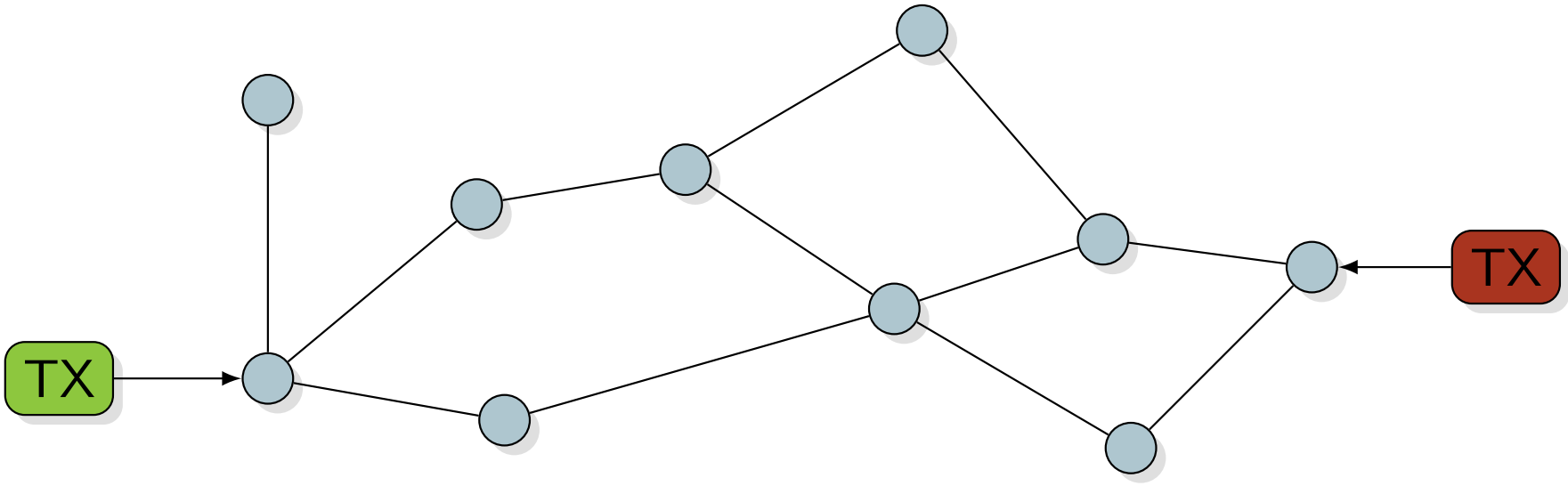


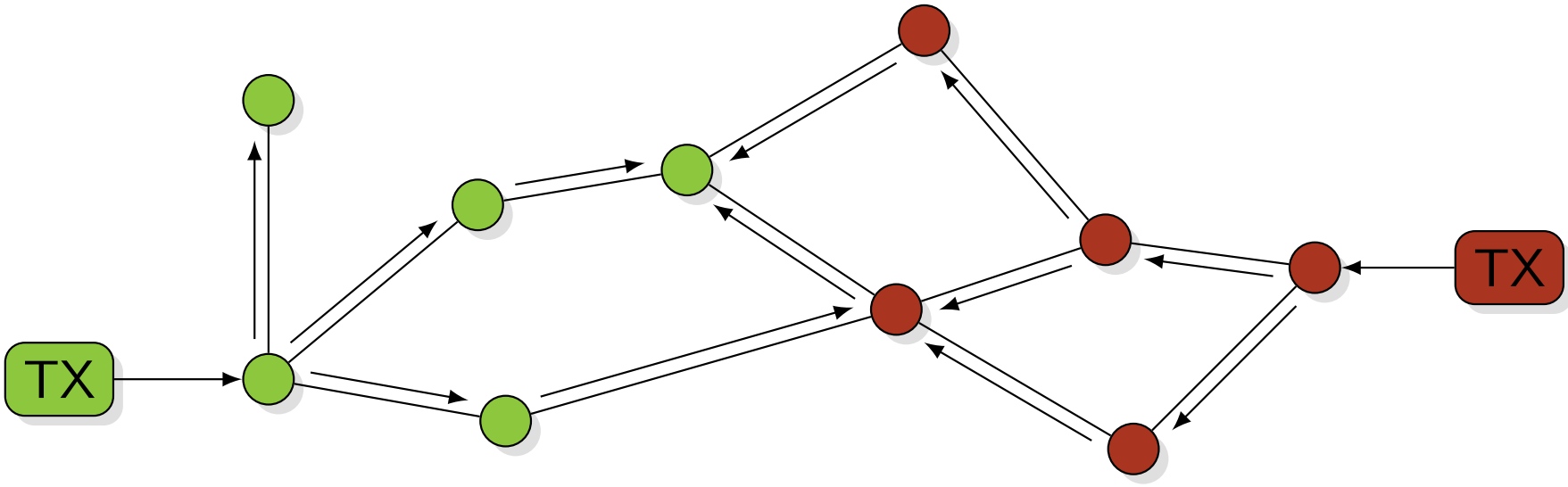
Transaction Conflicts



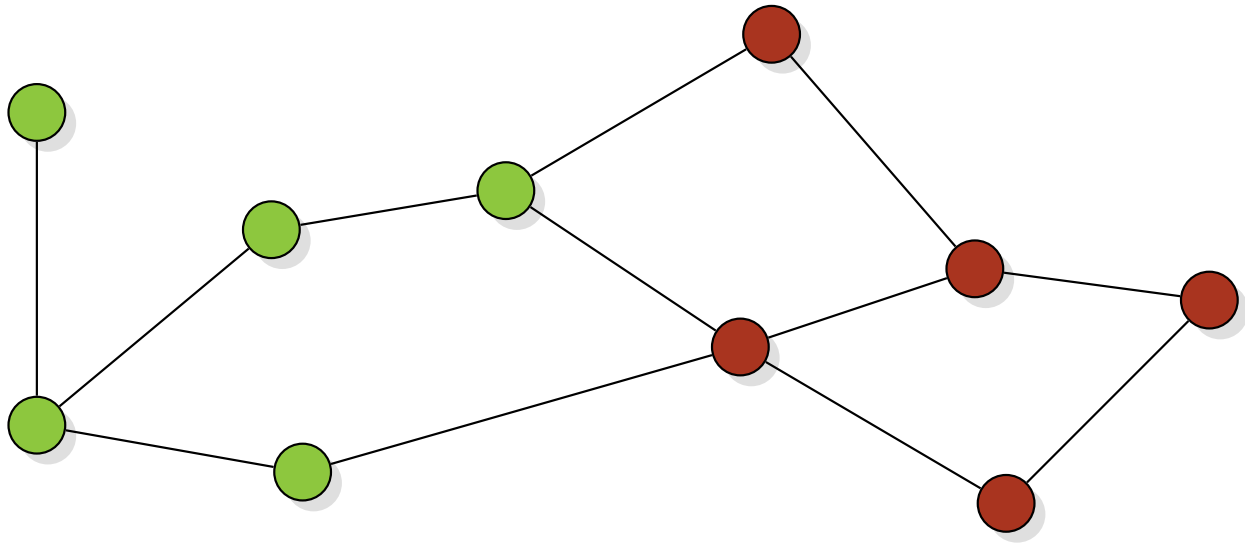
Transaction Conflicts



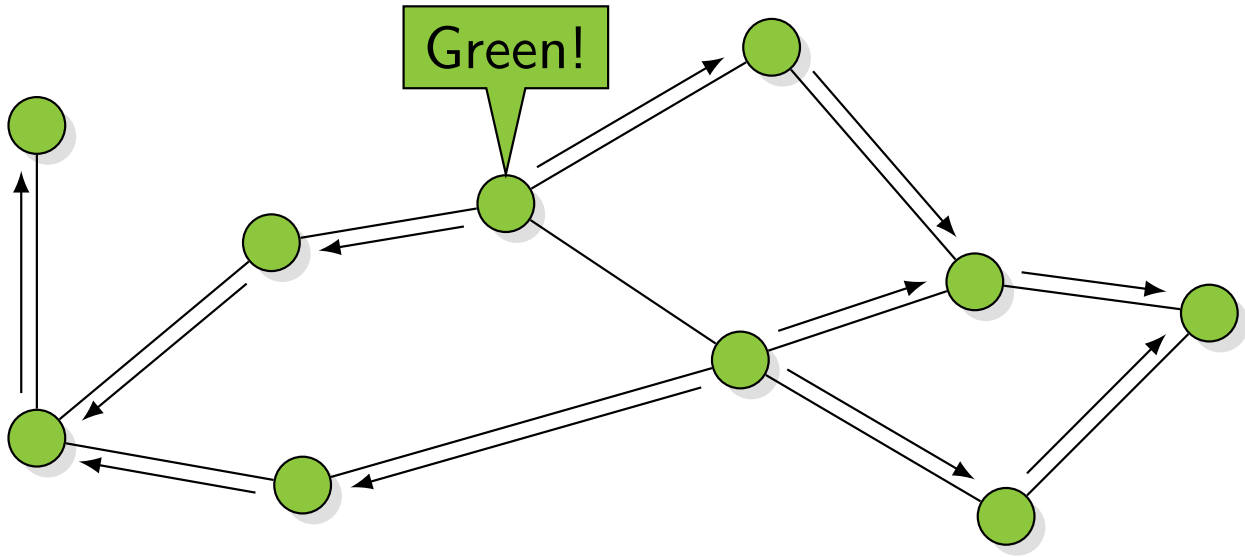
Transaction Conflicts



Resolving Conflicts



Resolving Conflicts

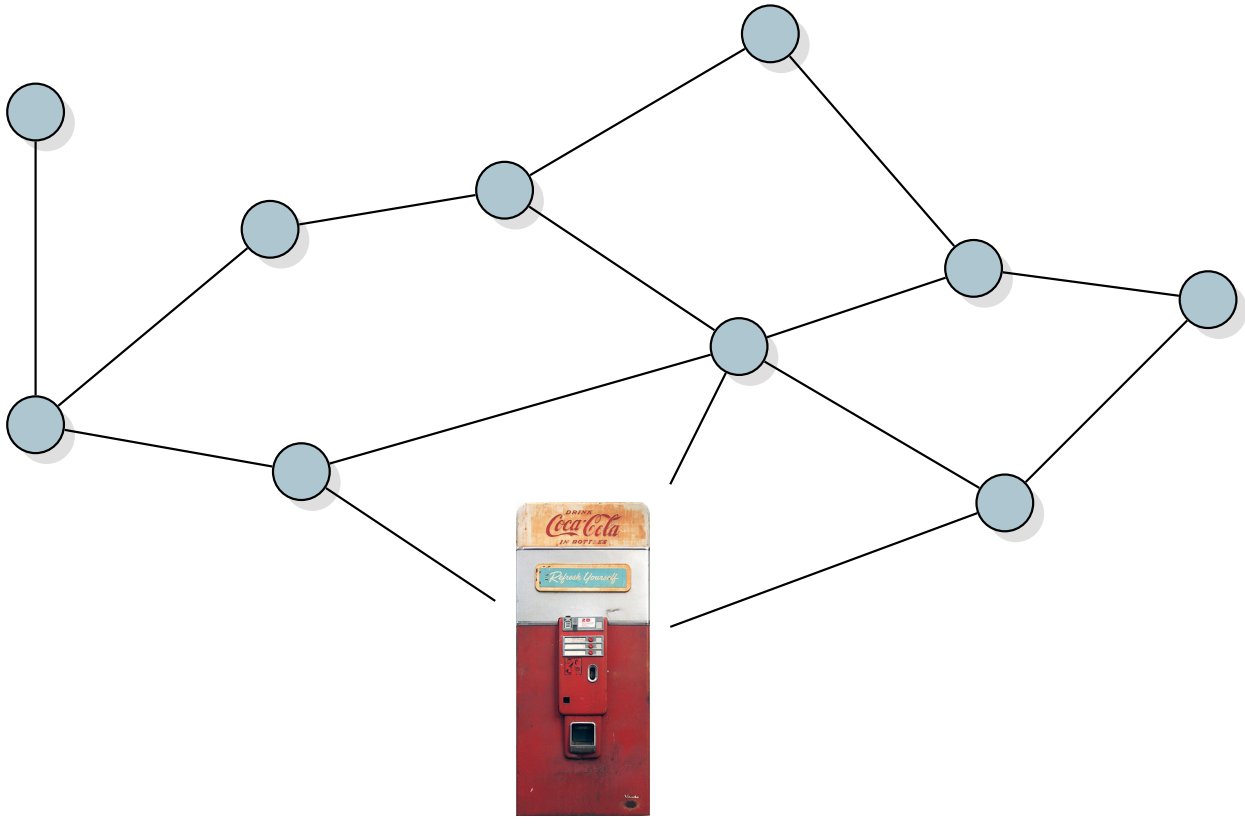


How to Choose a Leader?

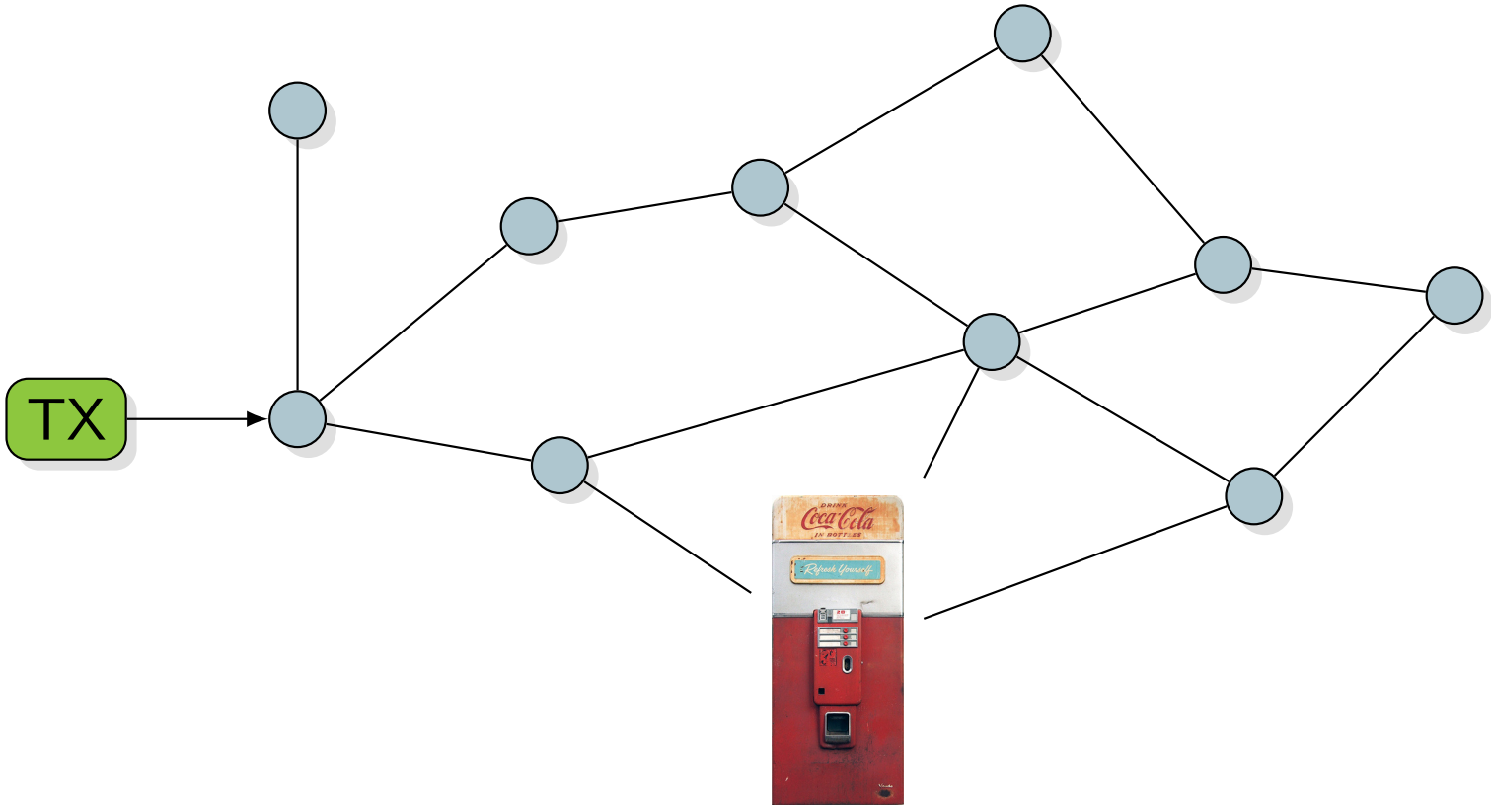
Securing Fast Payments

Let's Buy a Snack

Transaction Confidence

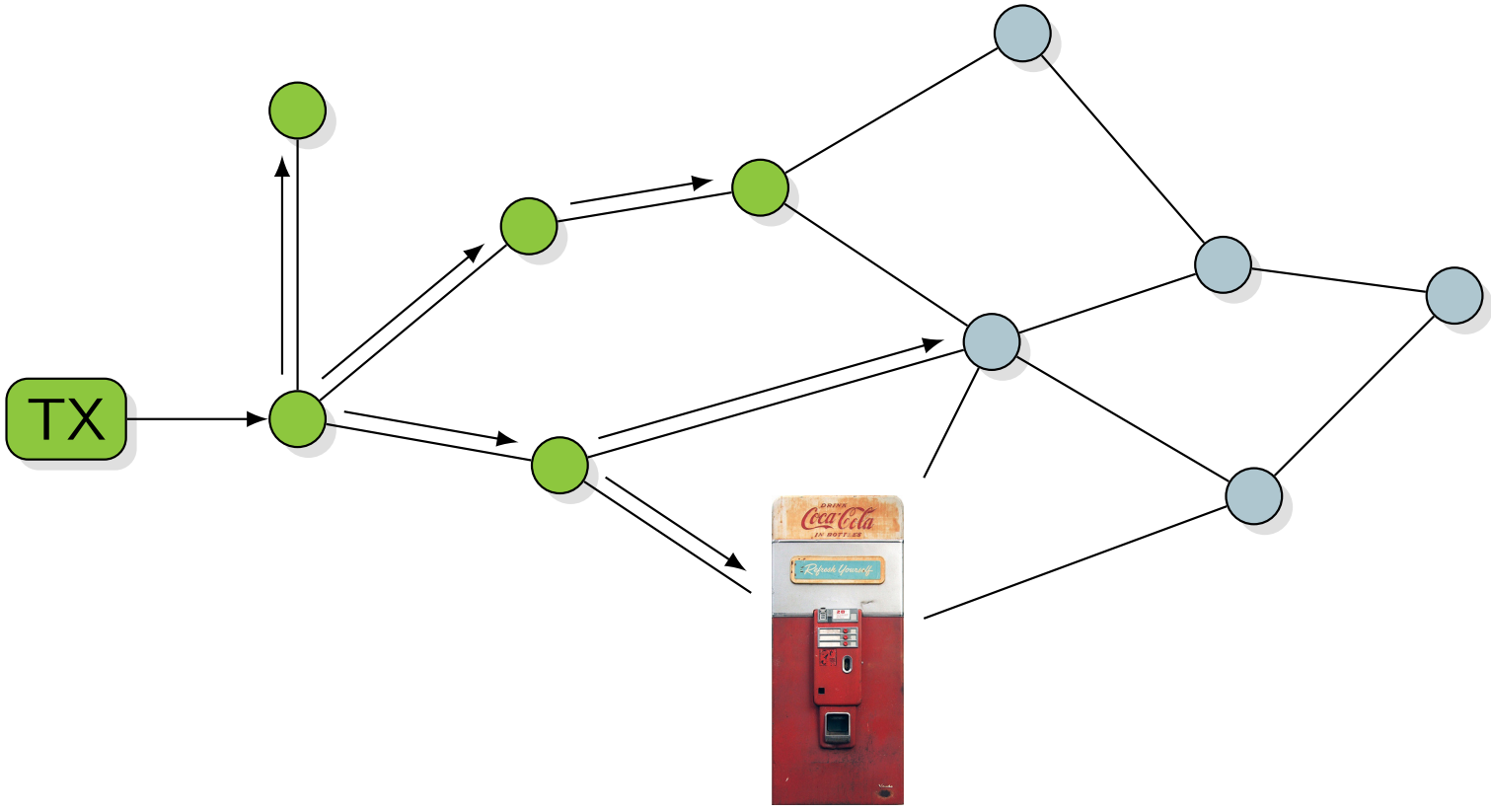


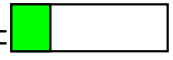
Transaction Confidence



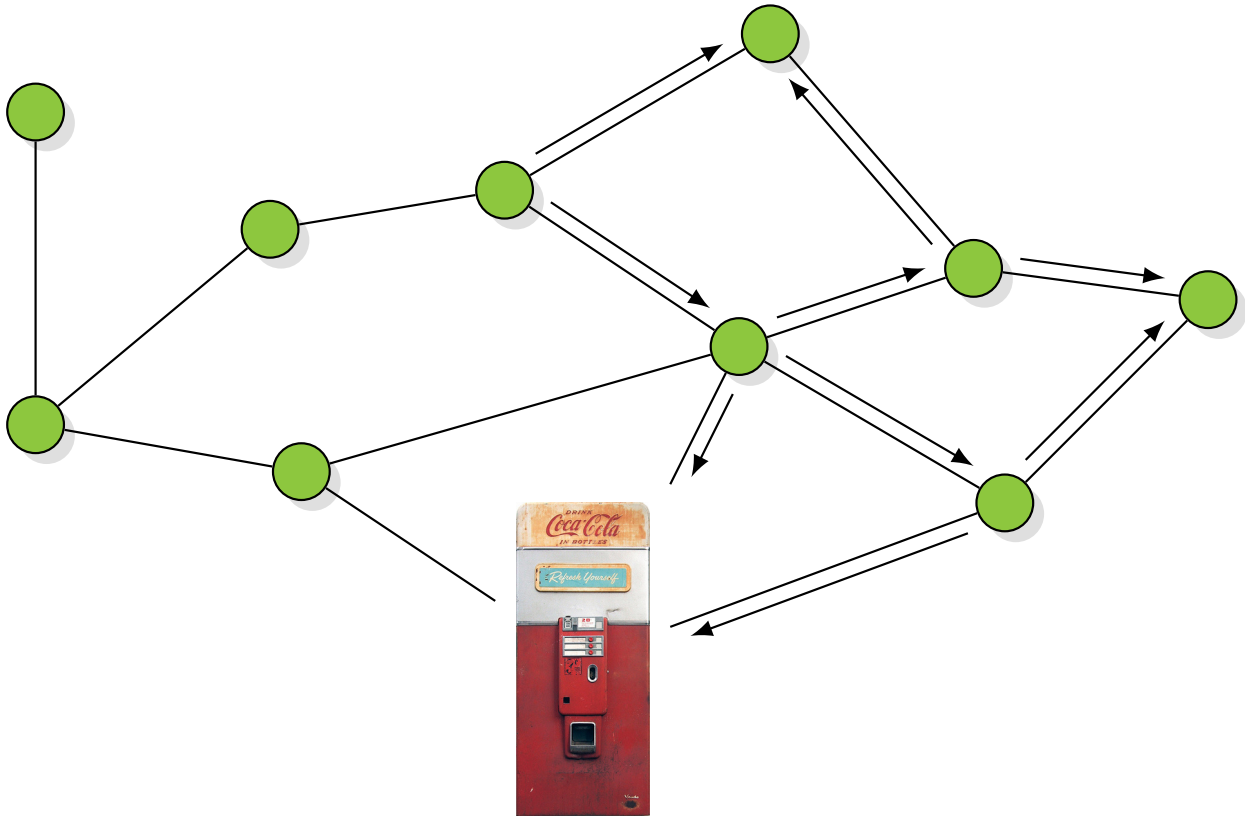
$$confidence(TX) = \square$$

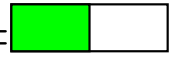
Transaction Confidence



$confidence(TX) =$ 

Transaction Confidence



$confidence(TX) =$ 

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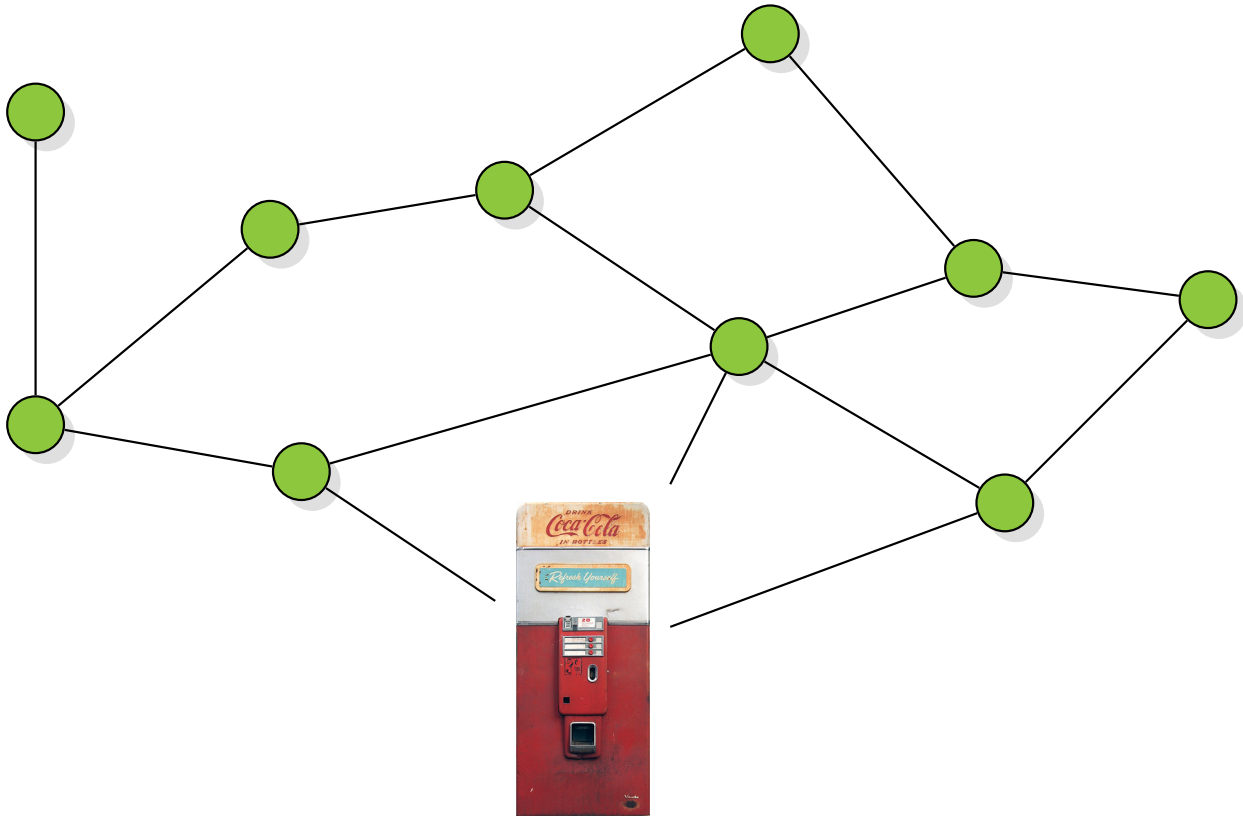
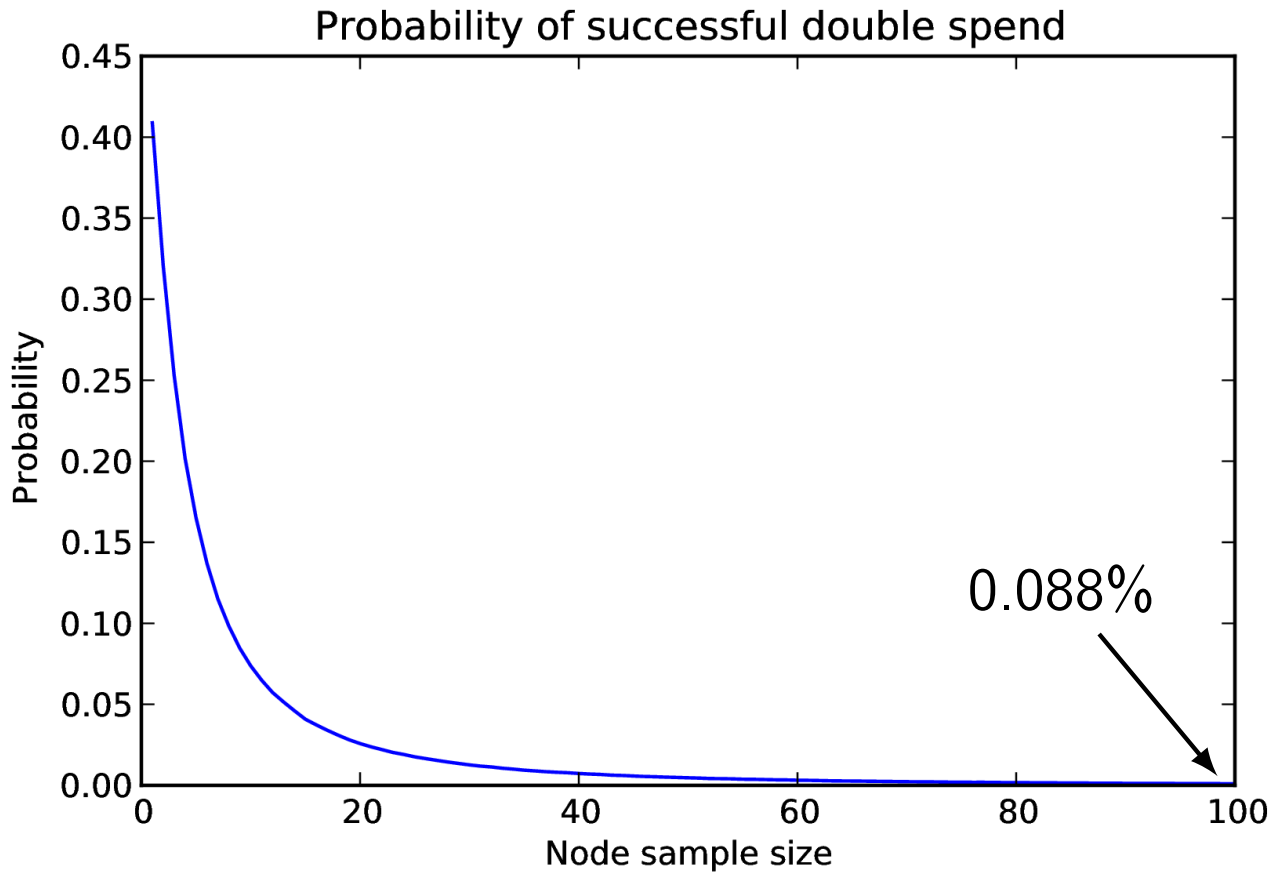


$confidence(TX) =$ 

Successful Doublespend

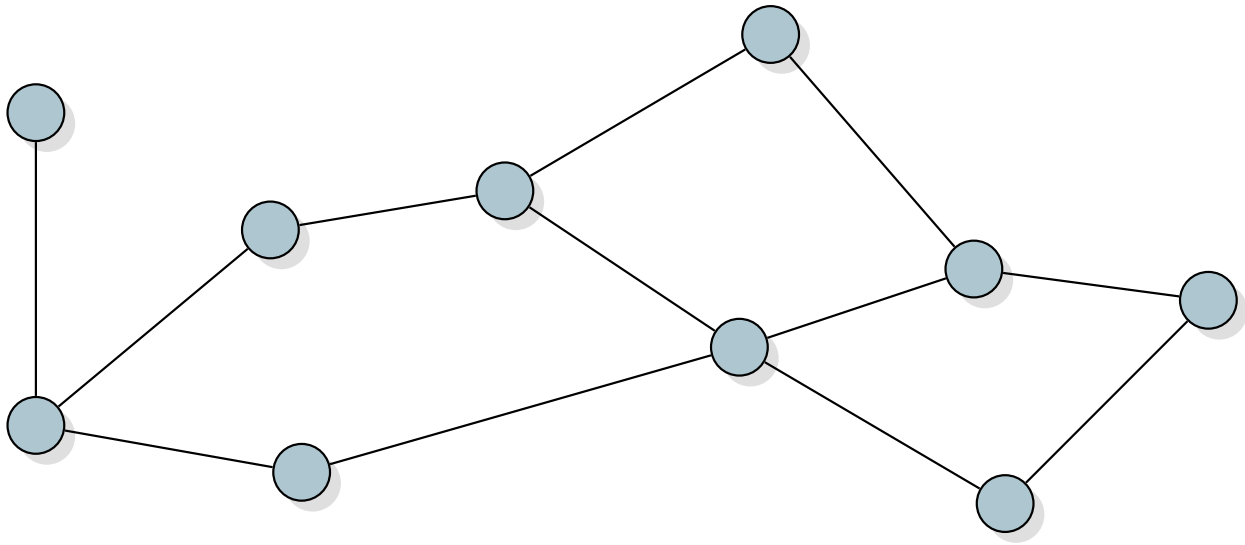


Privacy

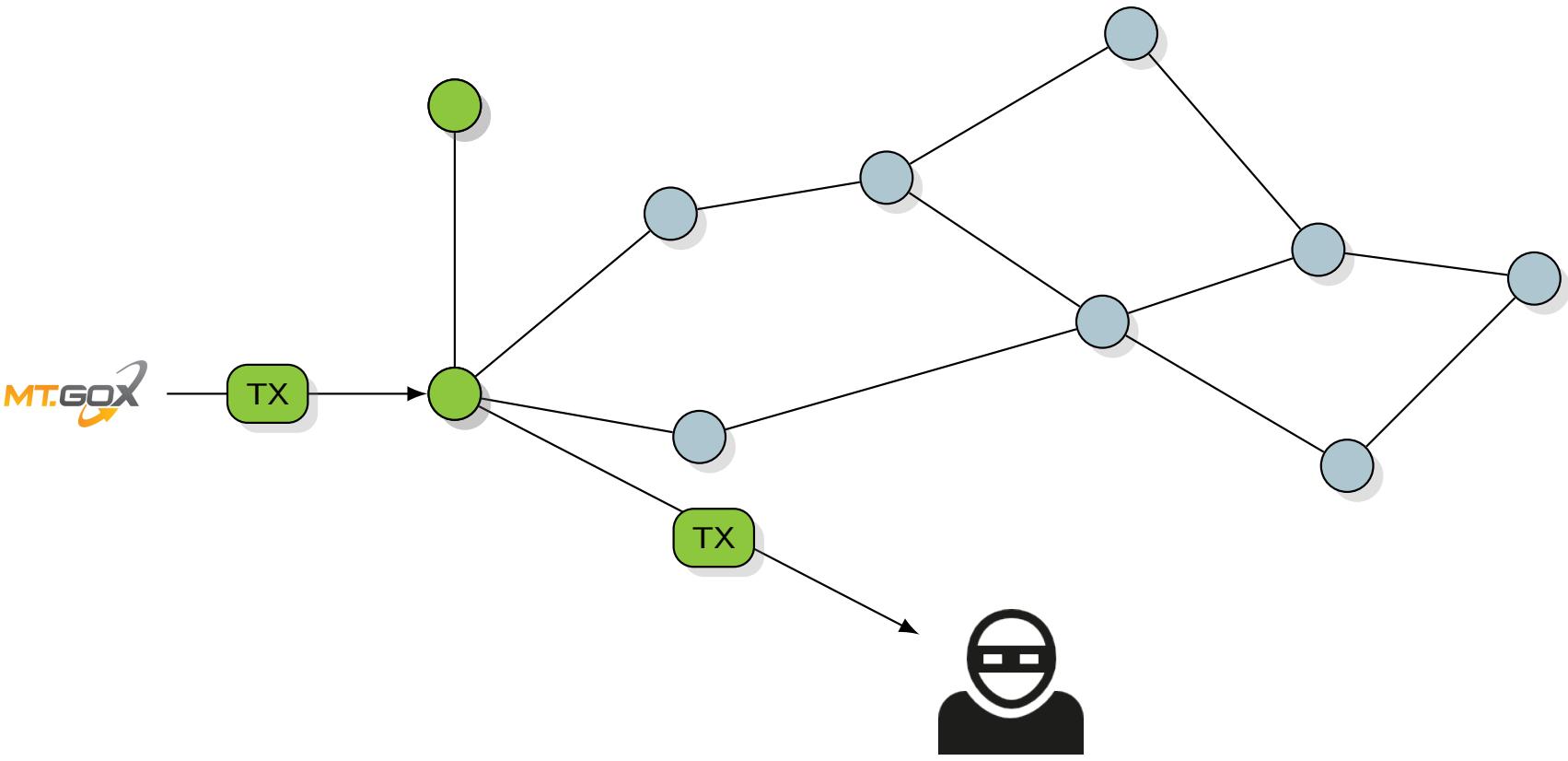
How (not) to Lose 500 Million USD

Addressing Transaction Malleability: MtGox has detected unusual activity on its Bitcoin wallets and performed investigations during the past weeks.

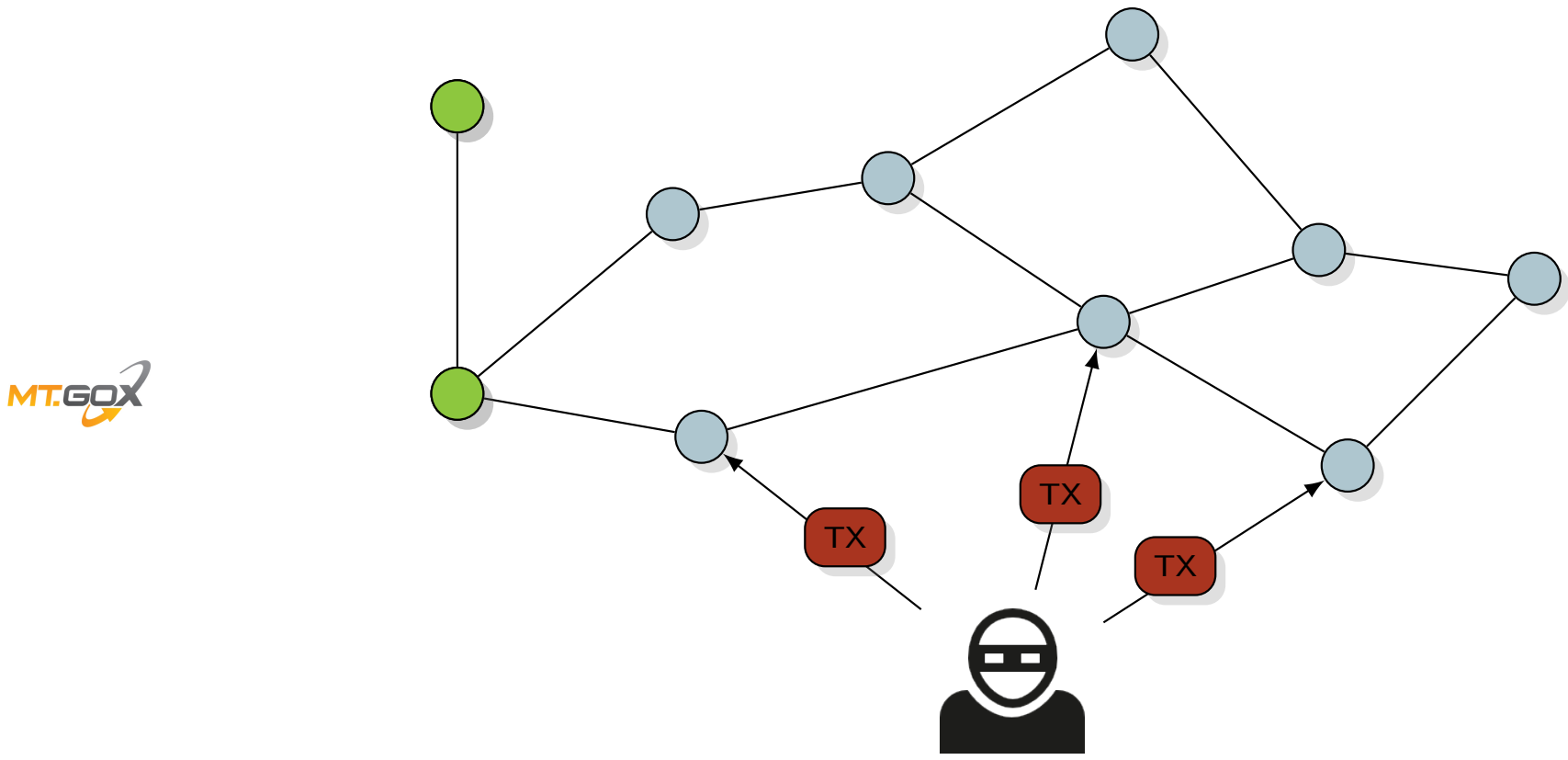
Transaction Malleability Attack



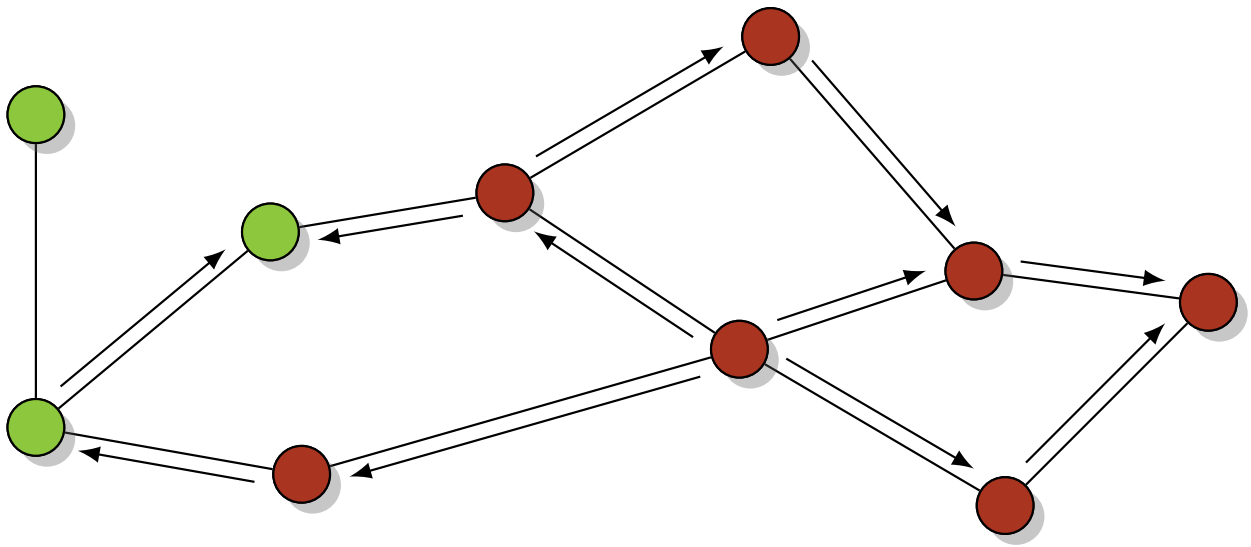
Transaction Malleability Attack



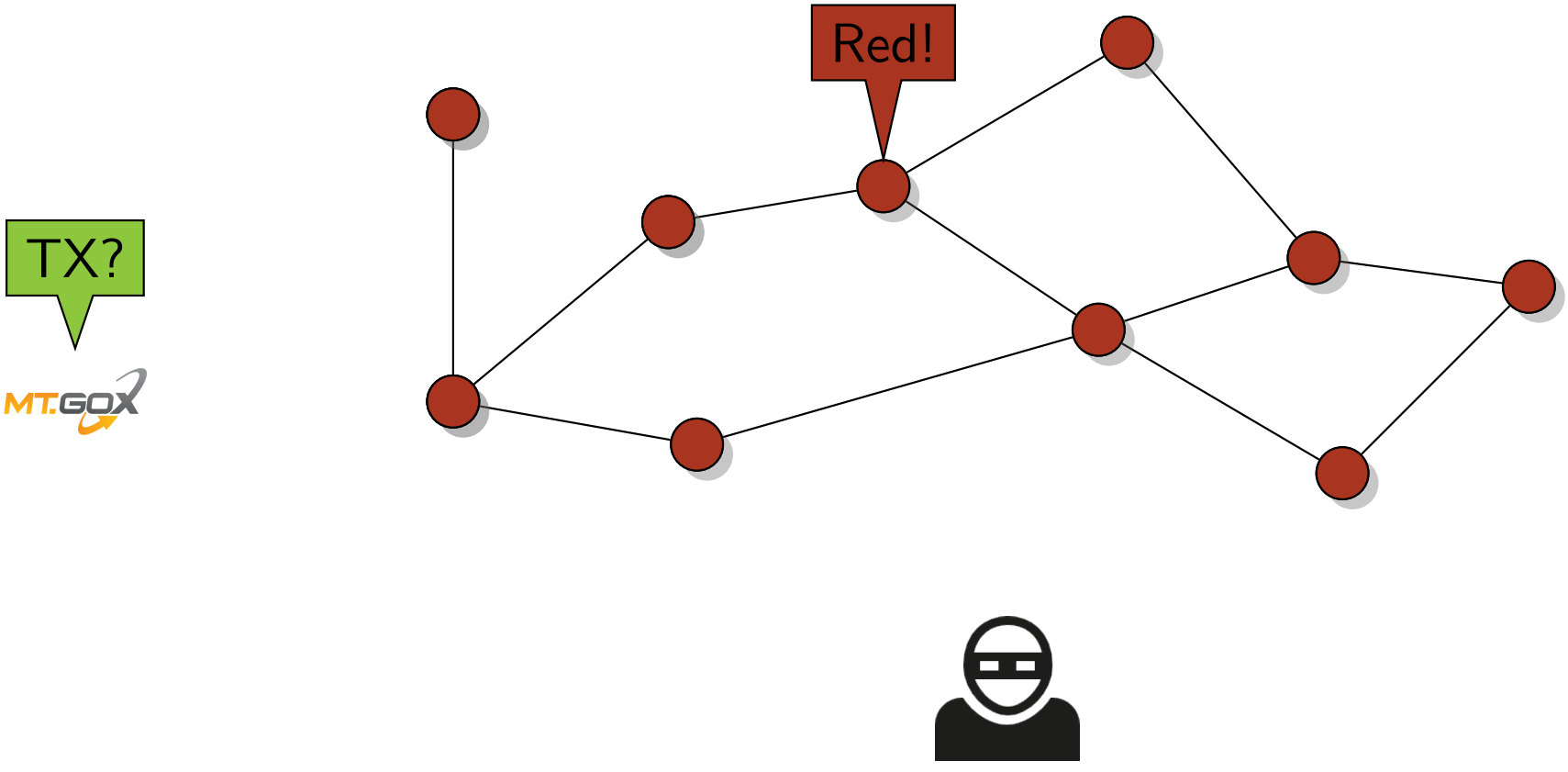
Transaction Malleability Attack



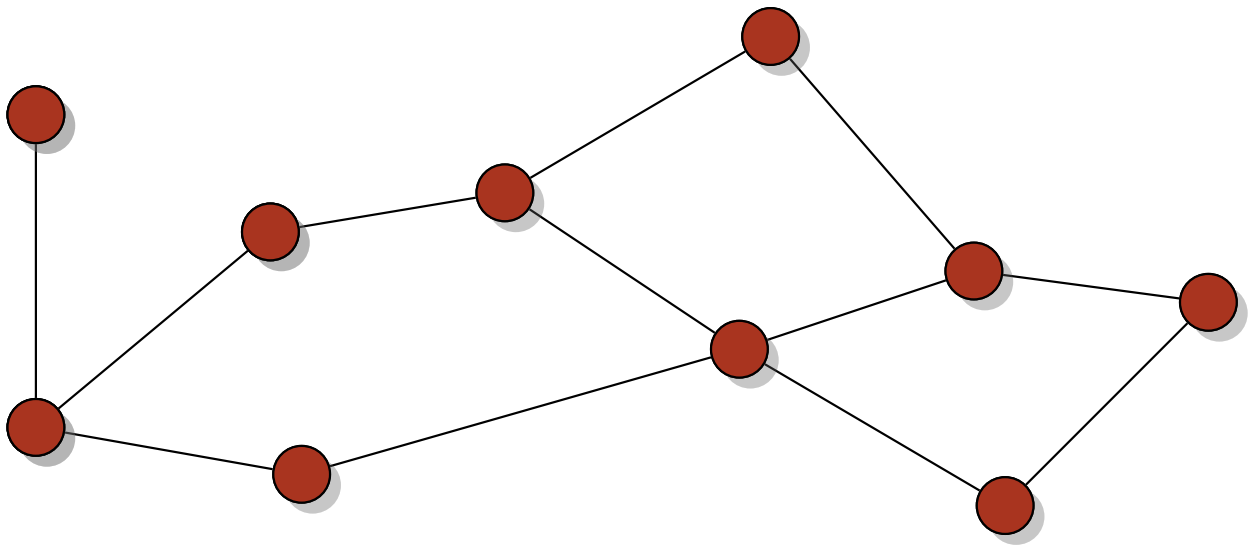
Transaction Malleability Attack



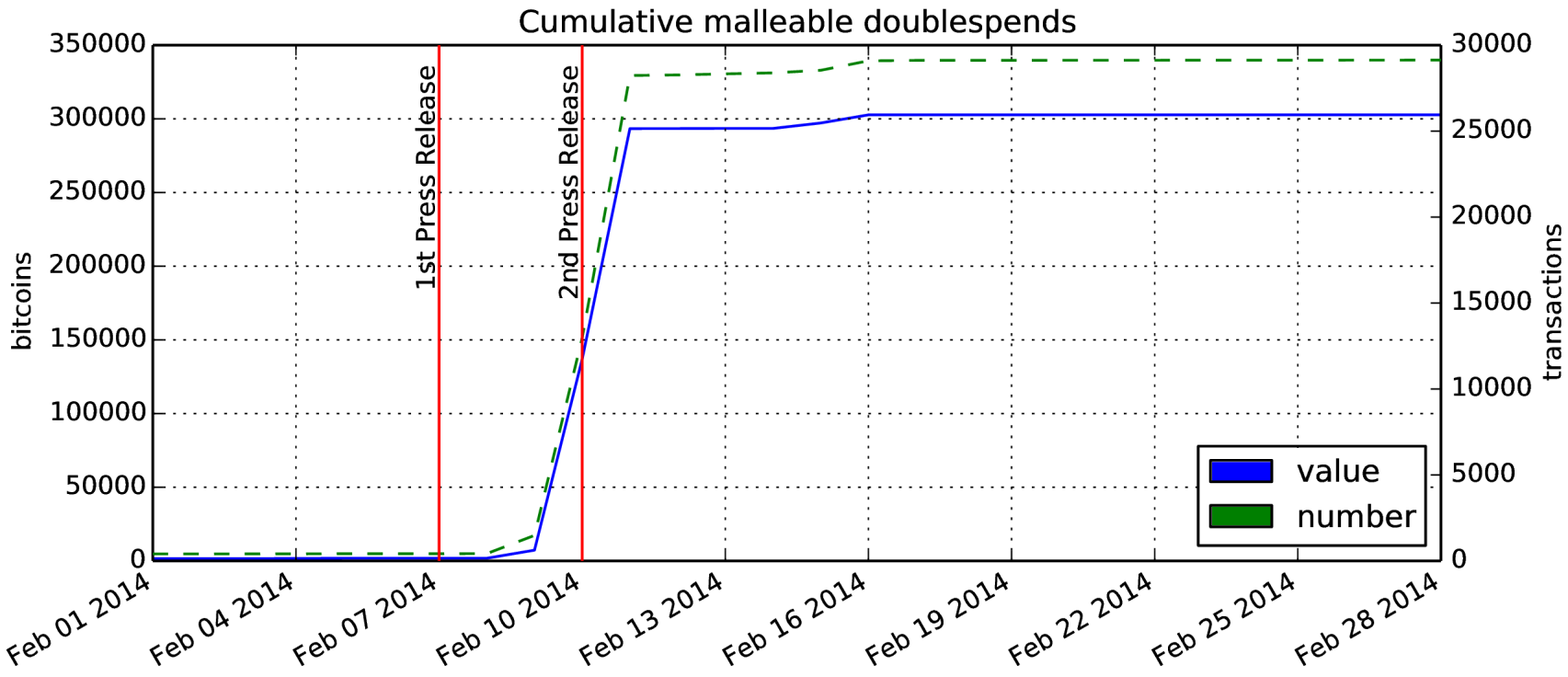
Transaction Malleability Attack



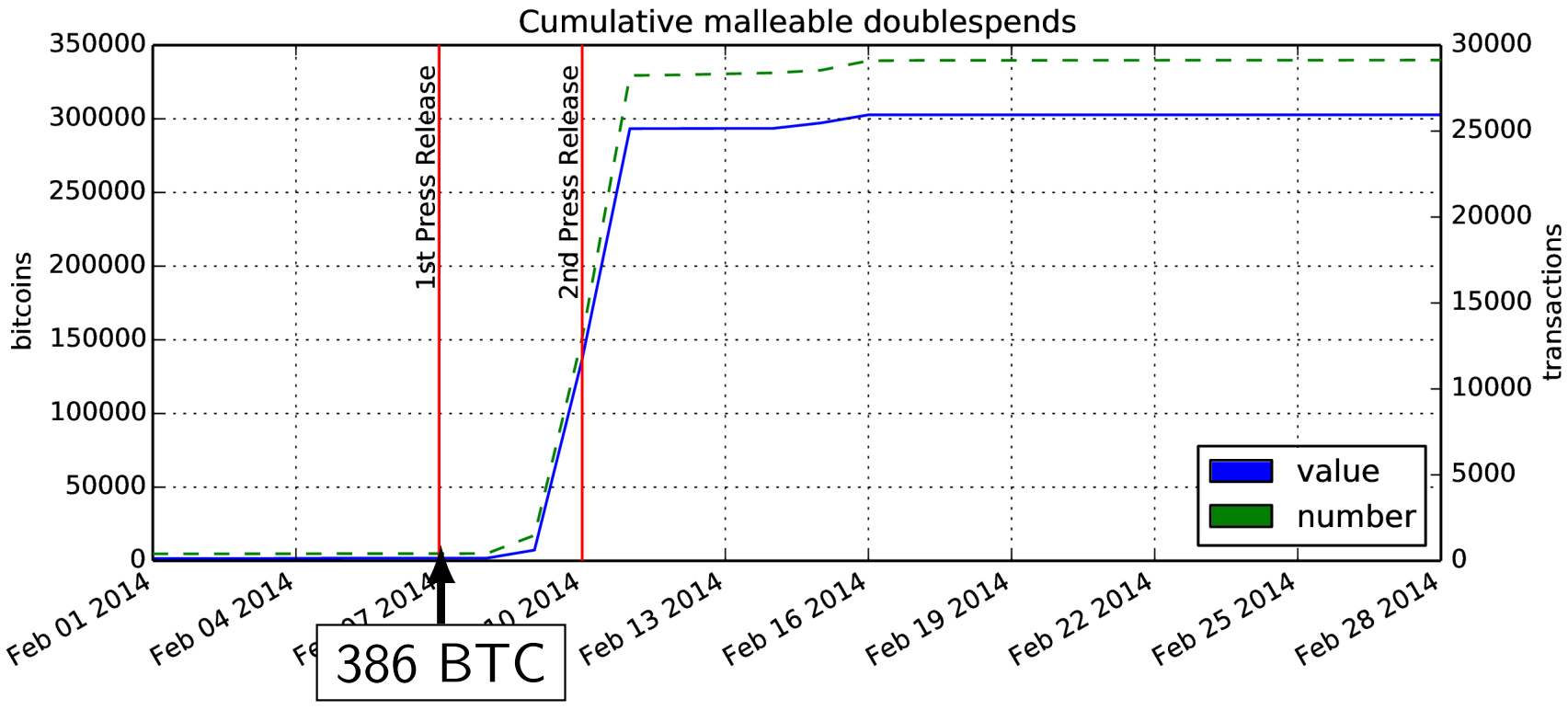
Transaction Malleability Attack



Incident Timeline

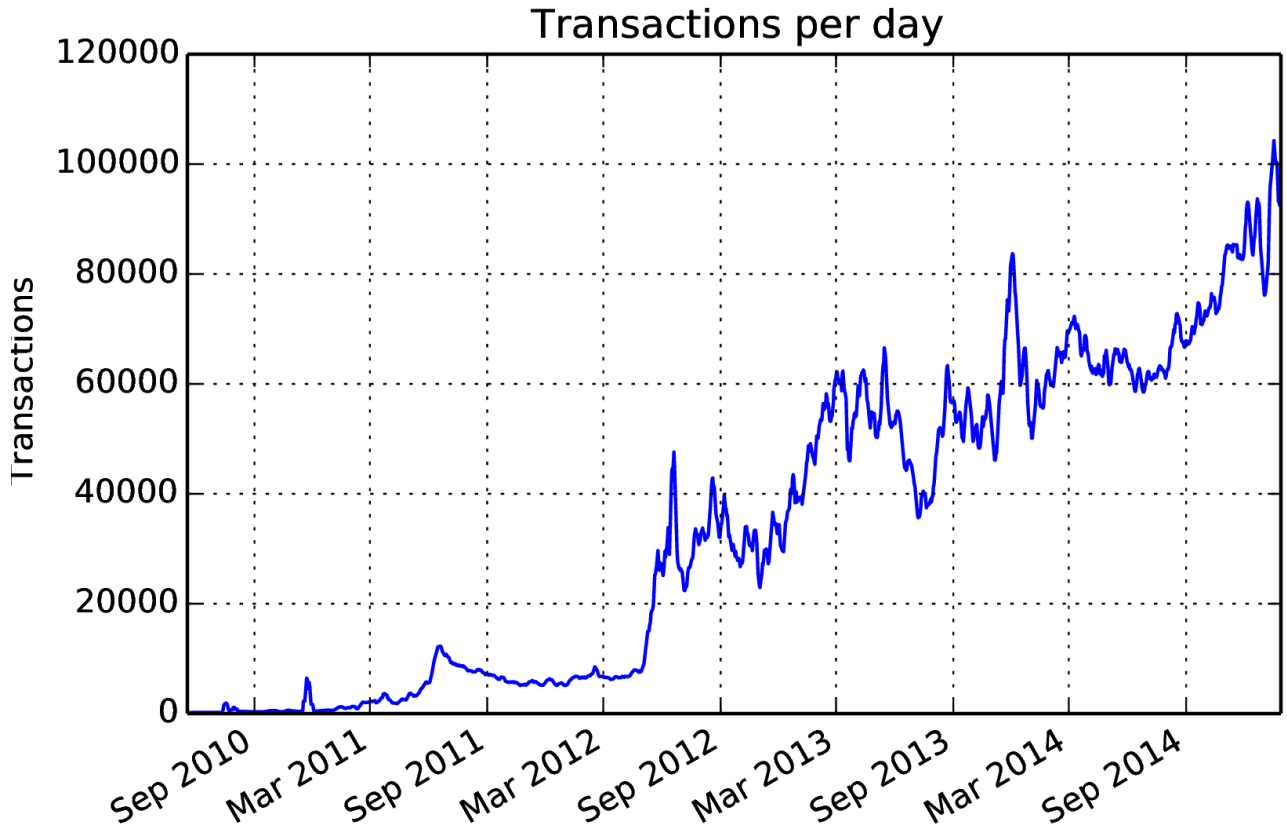


Incident Timeline

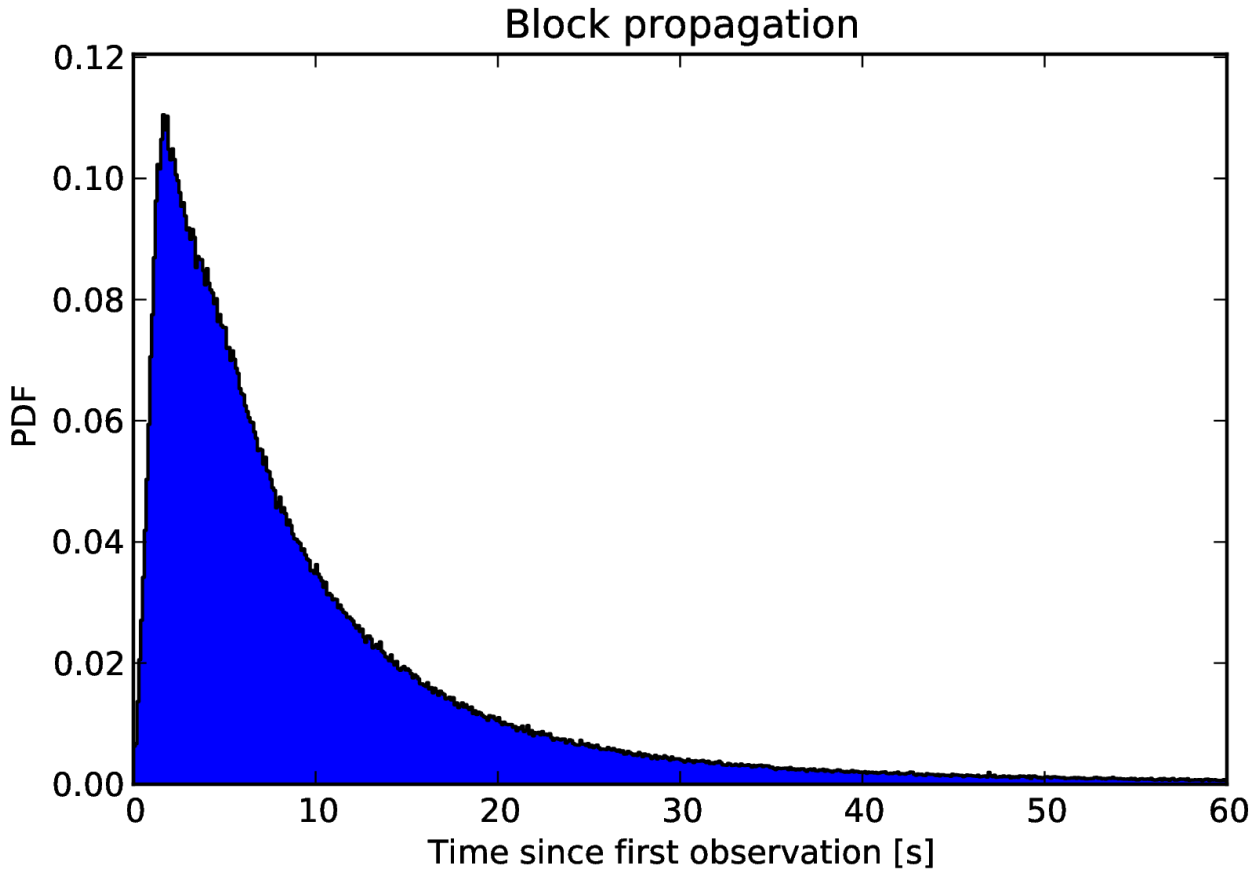


Does Bitcoin Scale?

The Bitcoin Ecosystem is Growing

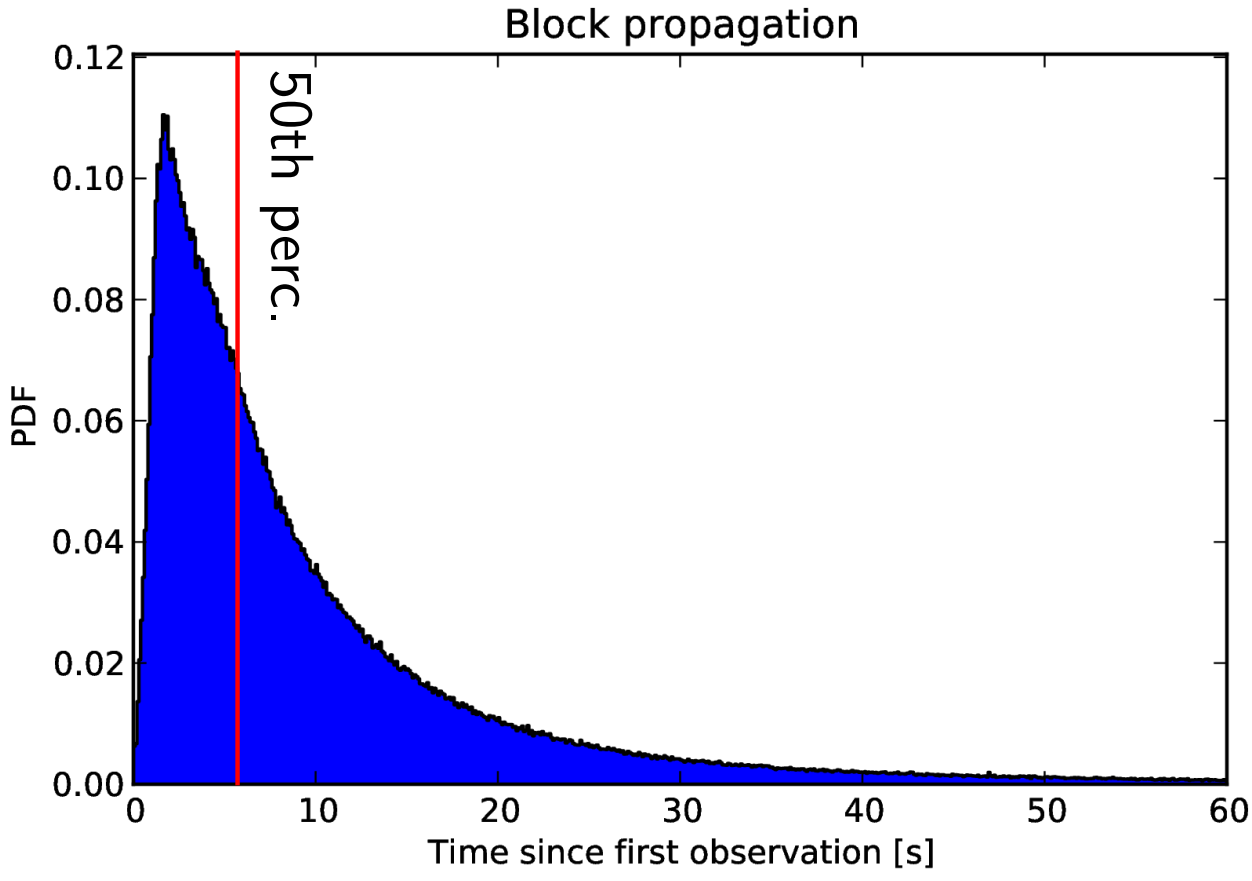


Propagation Speed



http://bitcoinstats.com

Propagation Speed



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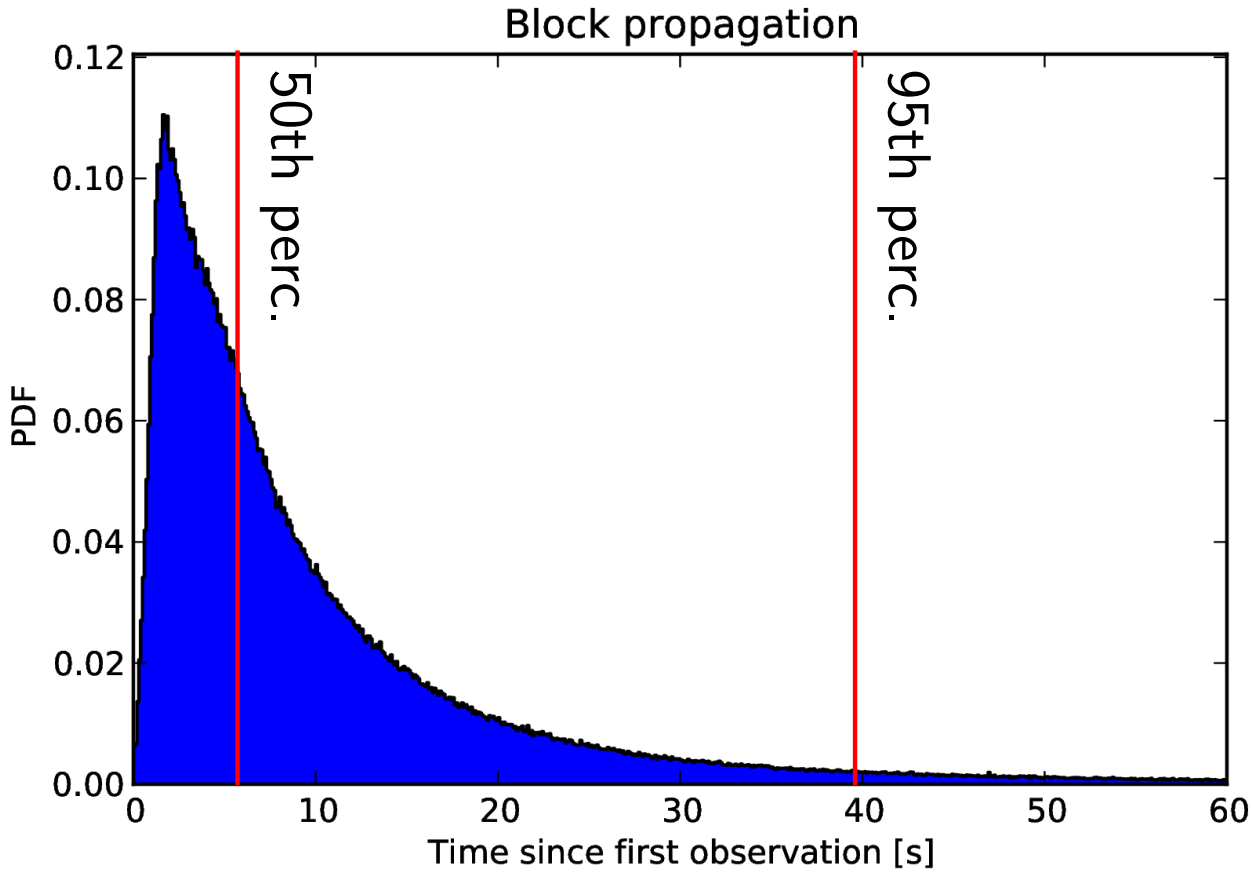

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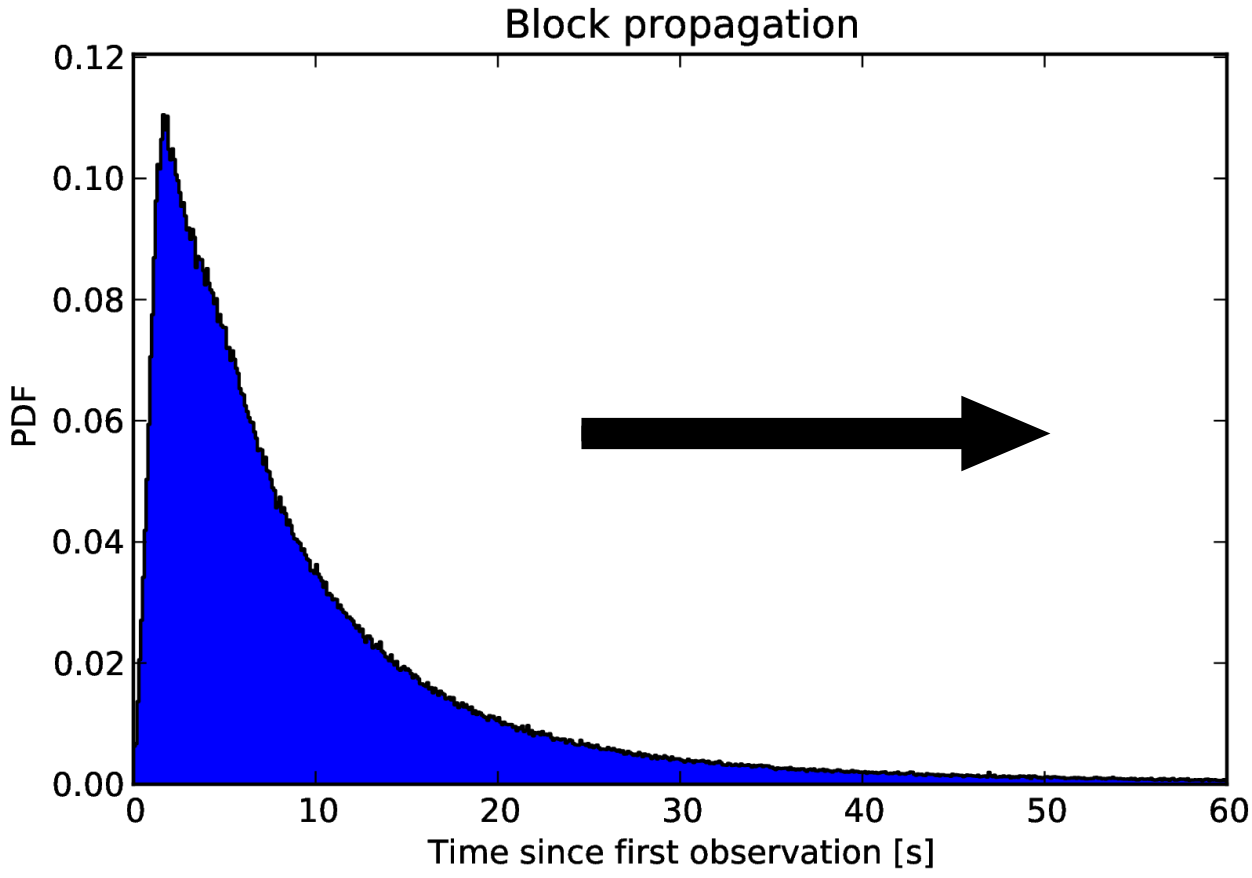
Propagation Speed



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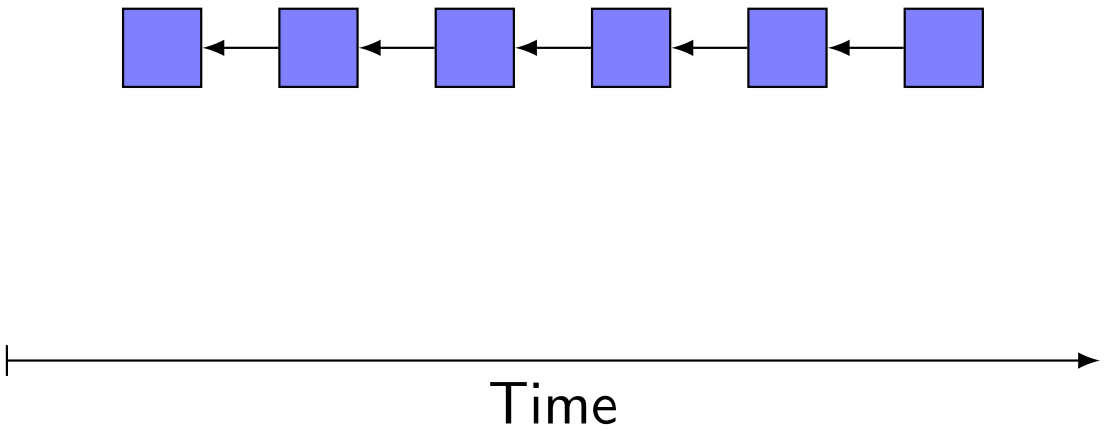
Blockchain



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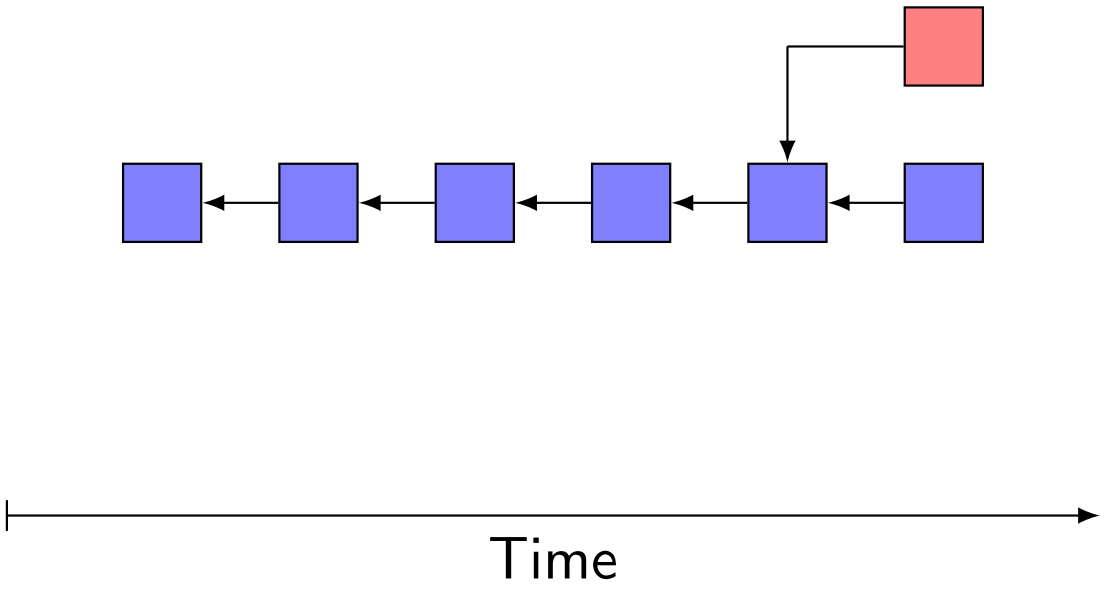

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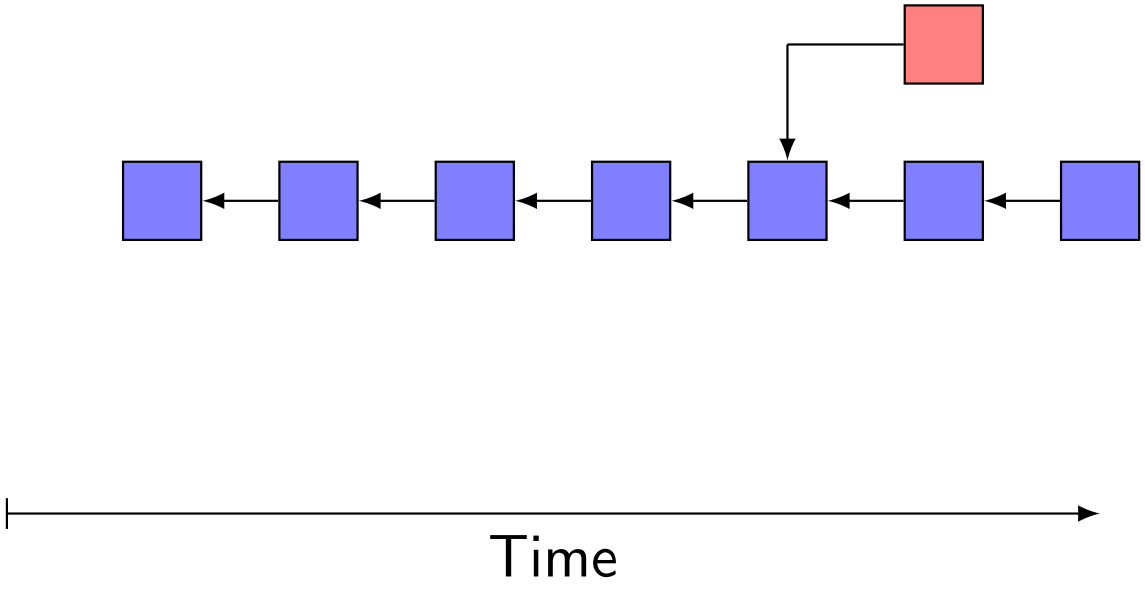

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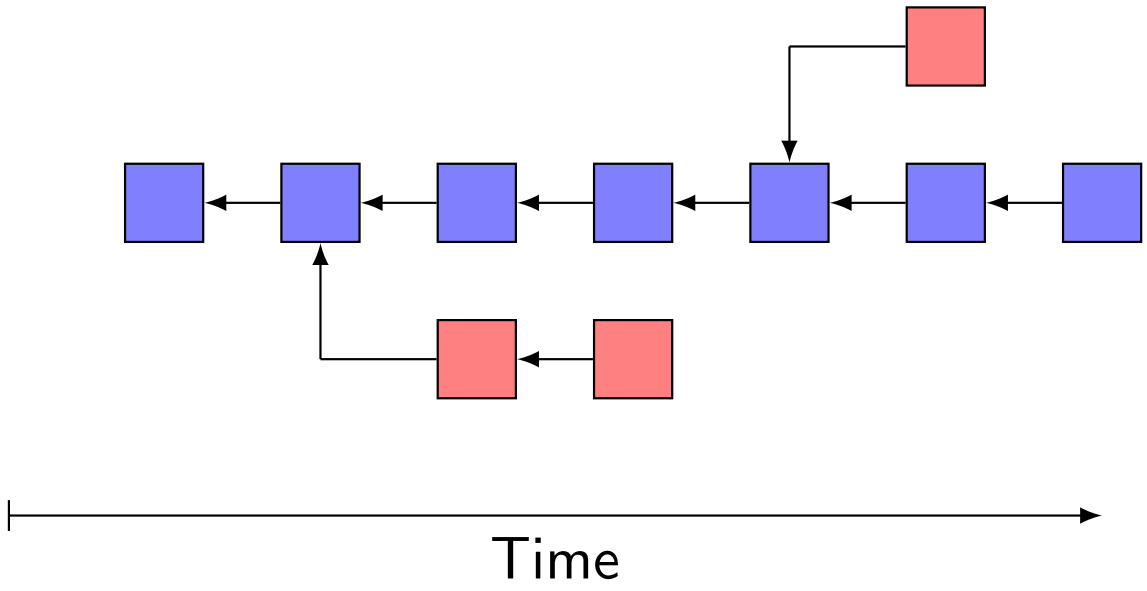
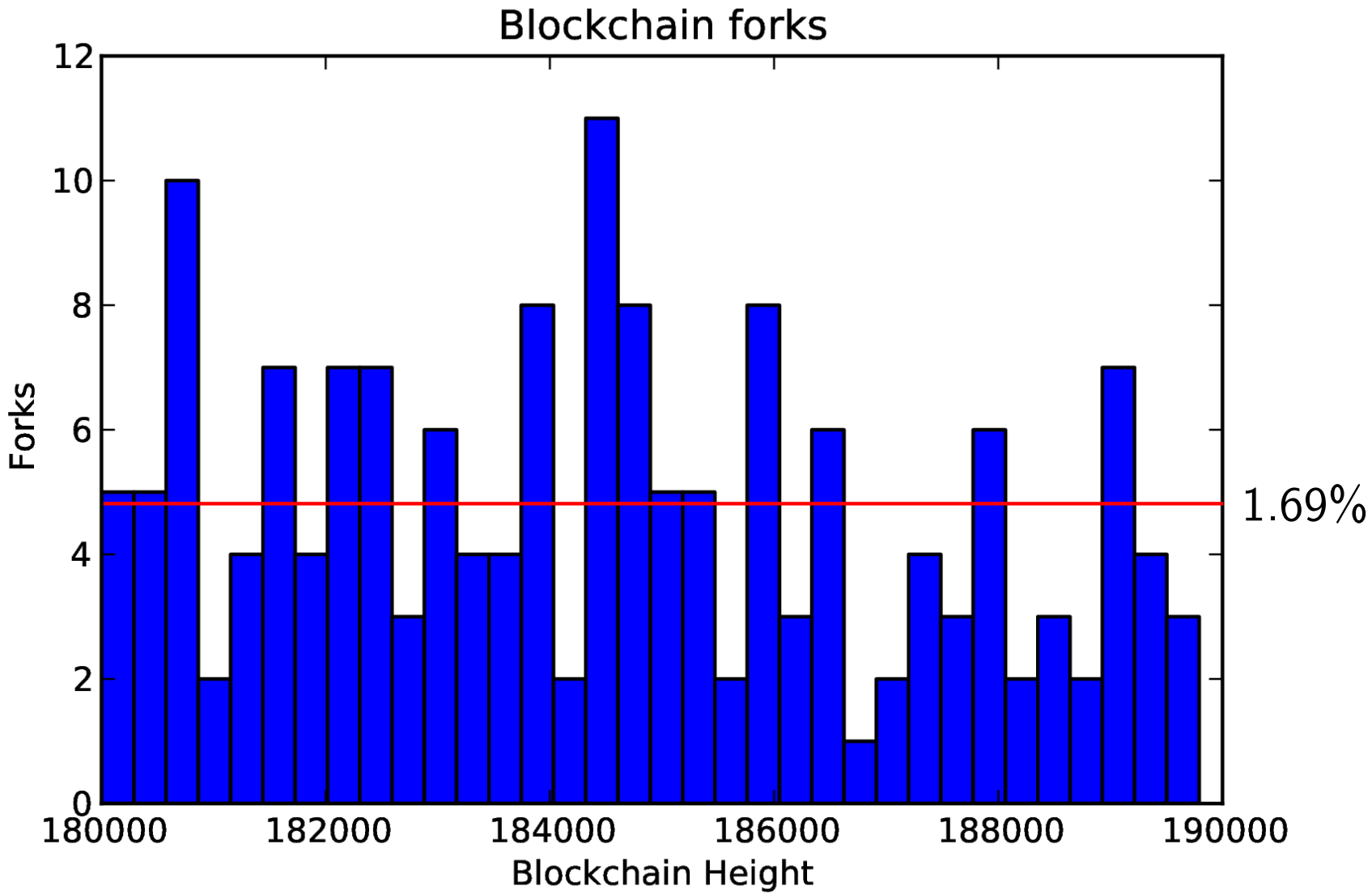
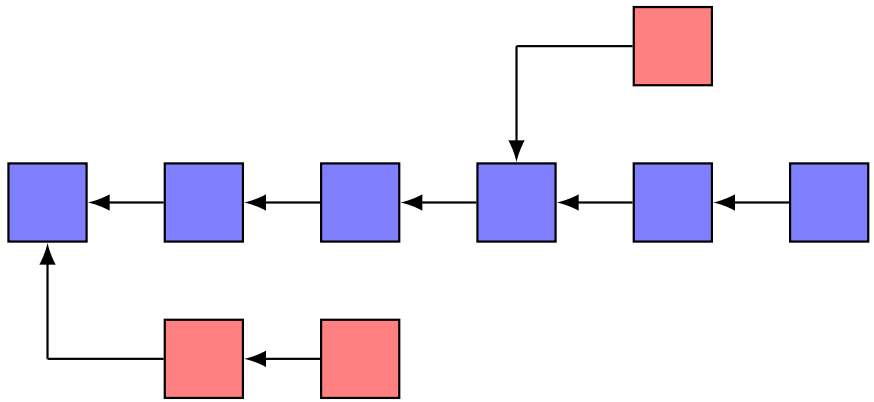


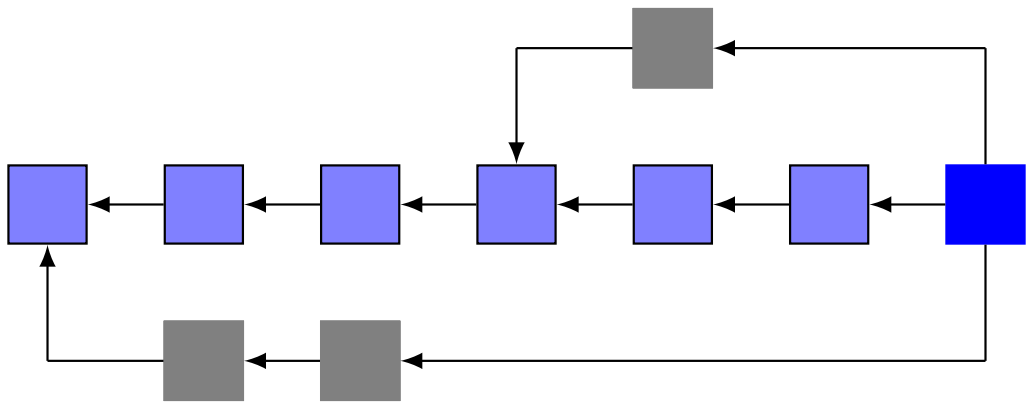
Forks


Blockchain forks
Forks
Blockchain Height
0
2
4
6
8
10
12
180000
182000
184000
186000
188000
190000
1.69%

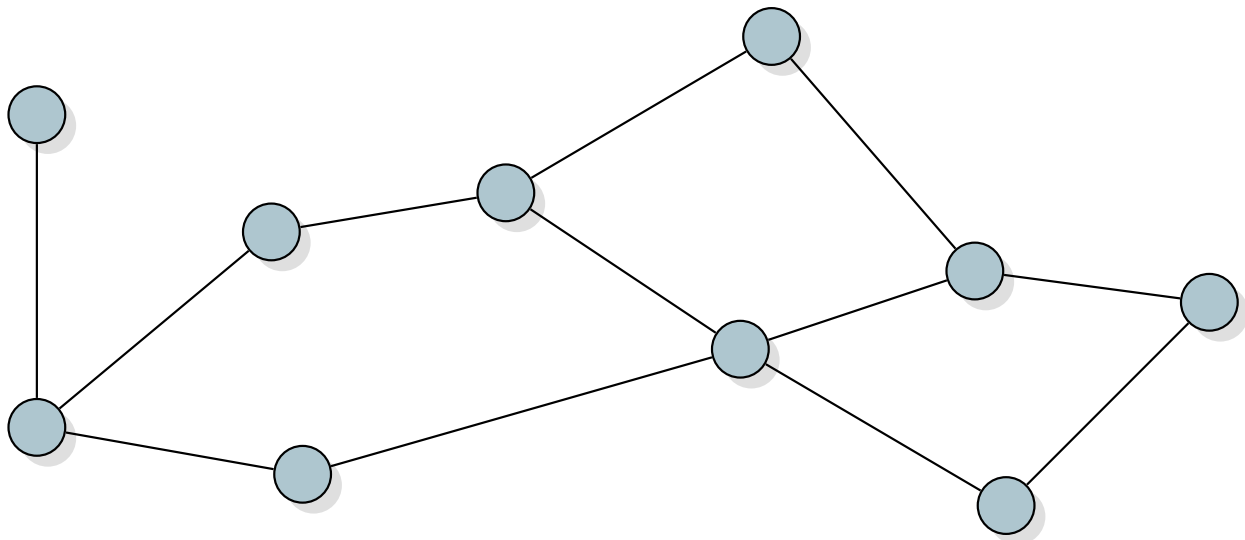
GHOST



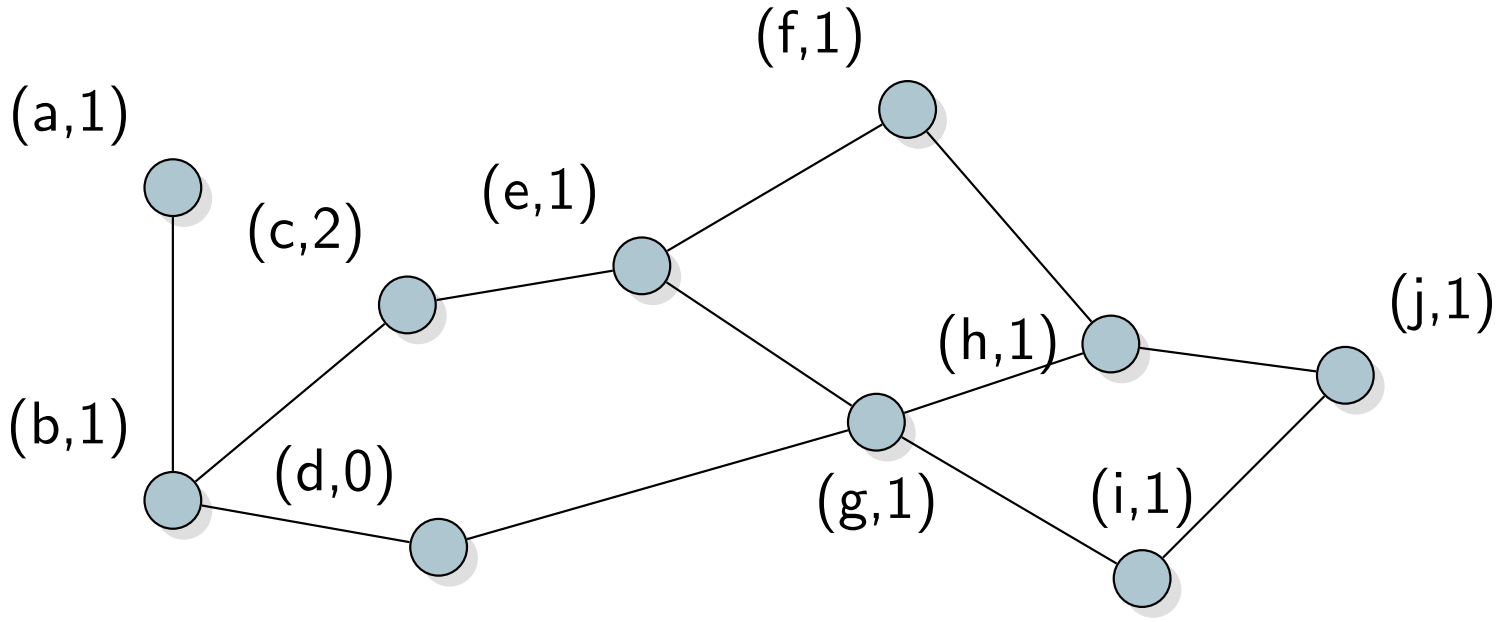
GHOST



Bitcoin Meets Strong Consistency



Bitcoin Meets Strong Consistency



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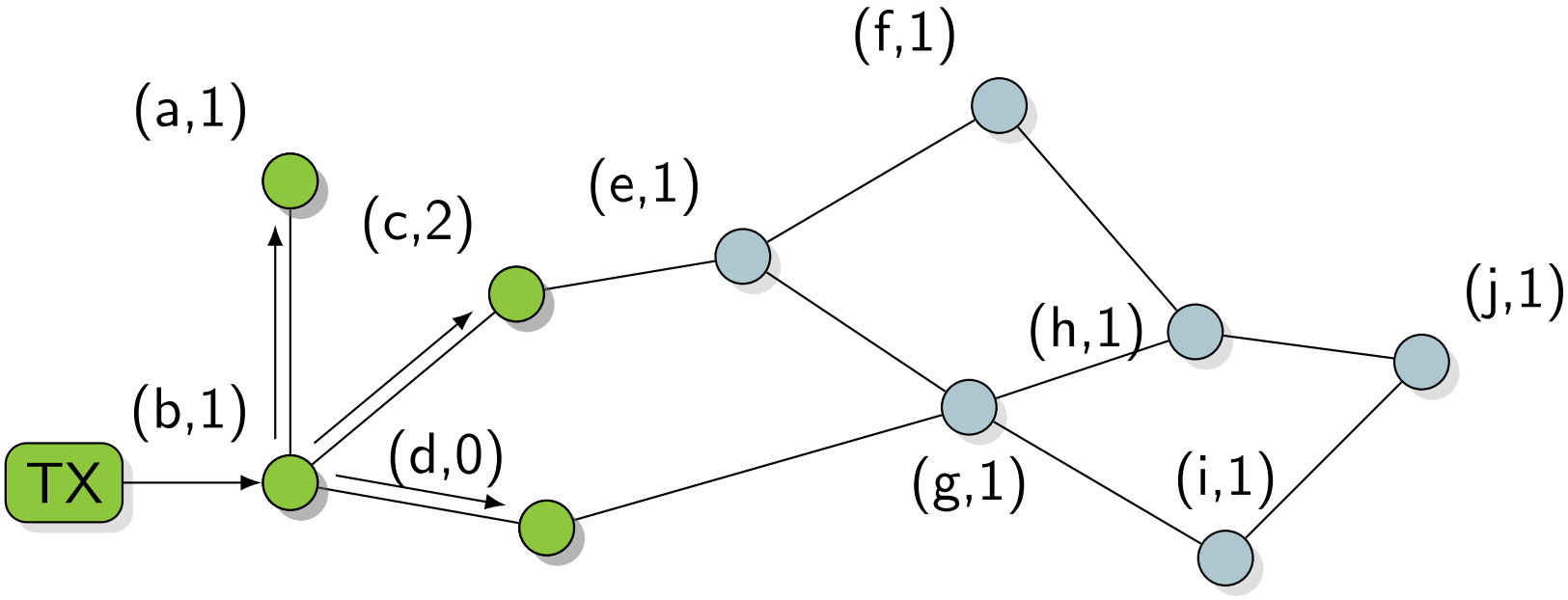
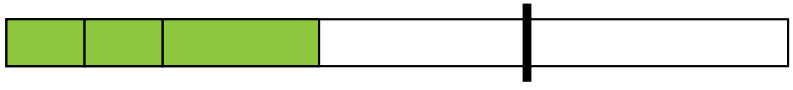


$votes(TX) =$ 

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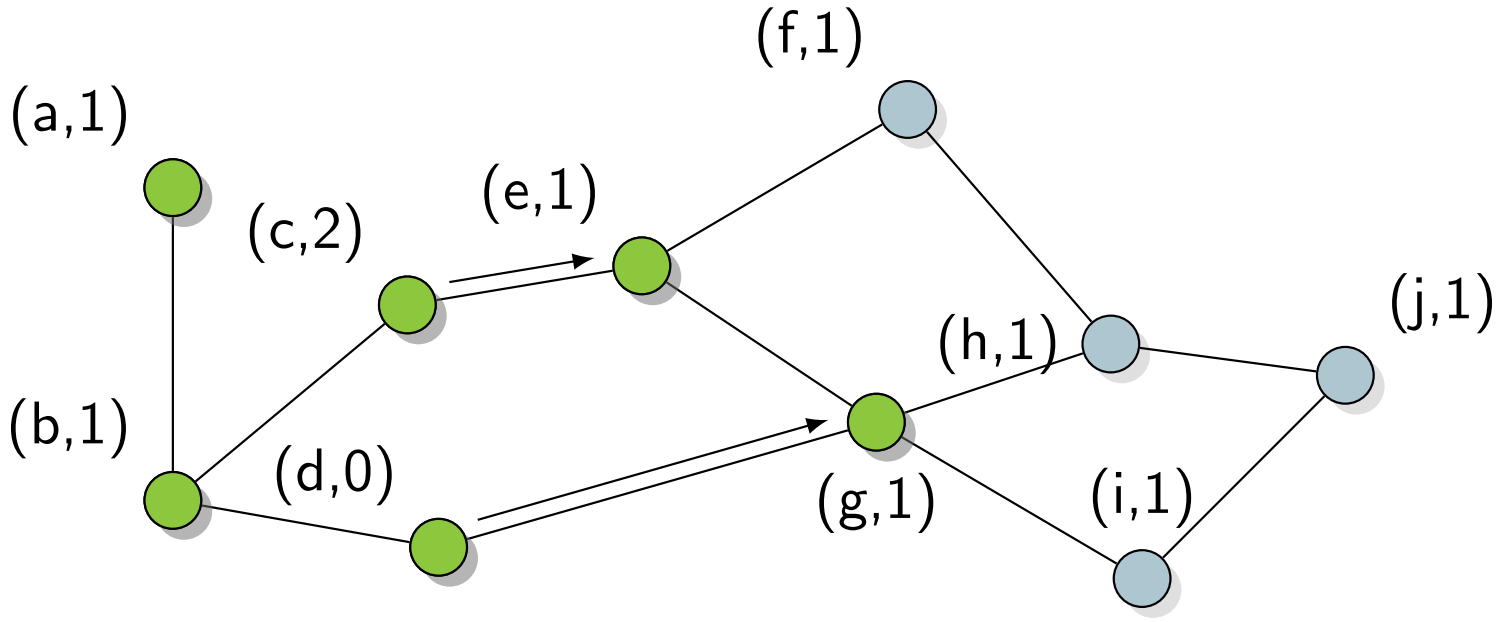

$votes(TX) =$ 

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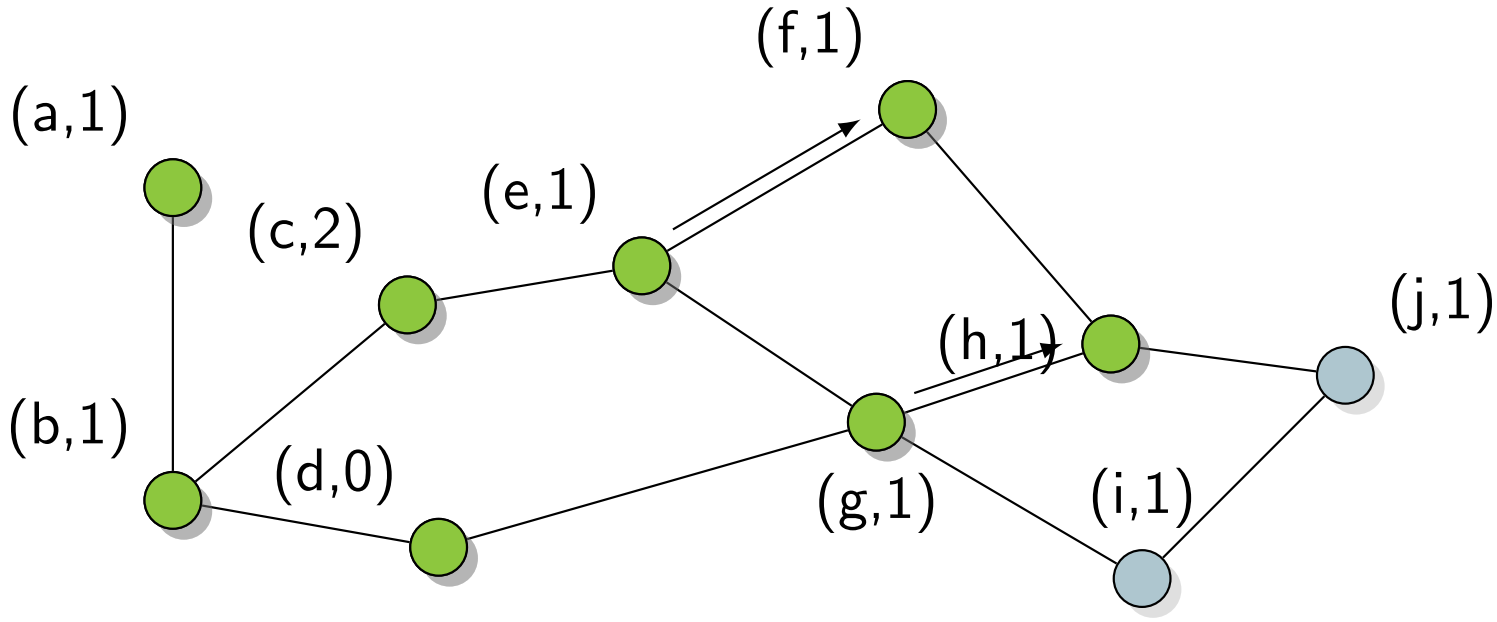

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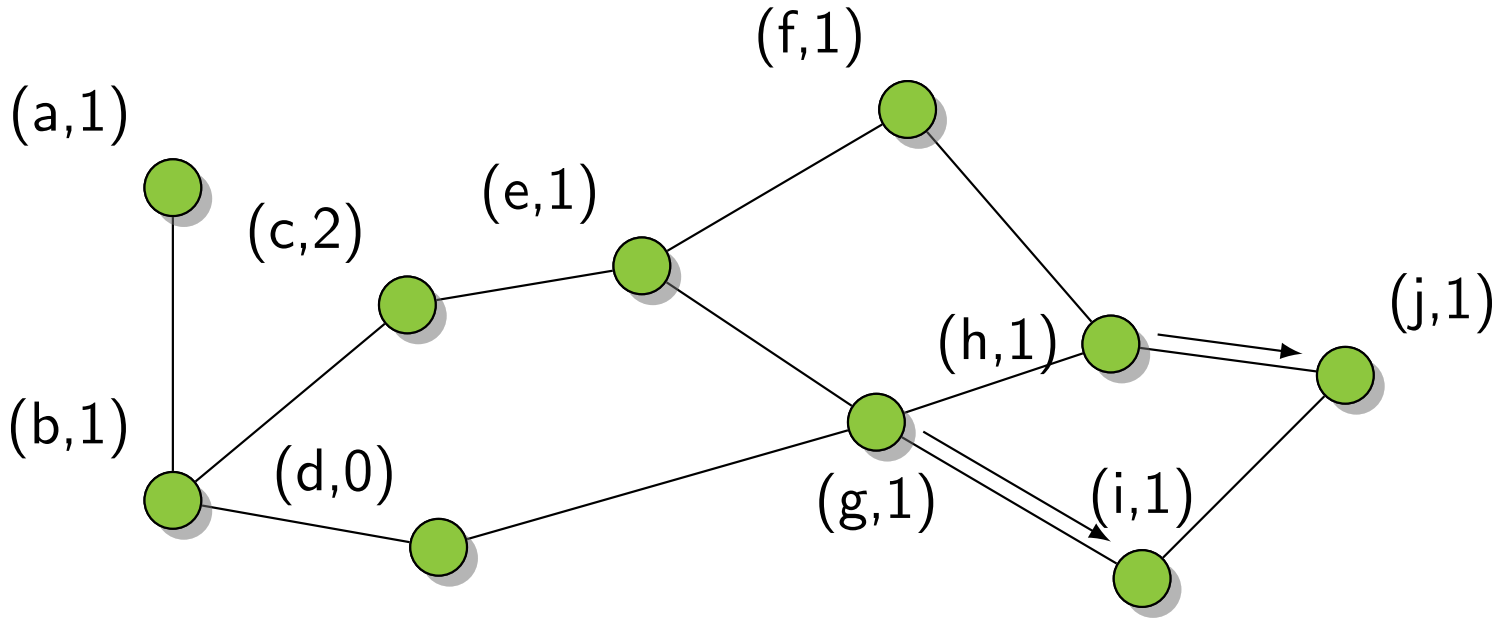
Bitcoin Meets Strong Consistency



$votes(TX) =$ 

Summary

- Bitcoin is not perfect. . .

Summary

- Bitcoin is not perfect...
- ...but we're working on it

Summary

- Bitcoin is not perfect...
- ...but we're working on it
- Be aware of tradeoffs!

Thank you, questions?