IEEE Symposium on Security and Privacy (**IEEE S&P**) 2020

https://erebus-attack.comp.nus.edu.sg/

A Stealthier Partitioning Attack against Bitcoin Peer-to-Peer Network

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May 2020

NUS National University of Singapore

EREBUS

Bitcoin relies on underlying ***peer-to-peer*** network

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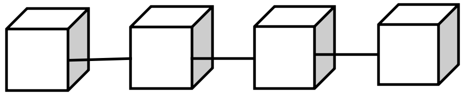
blockchain



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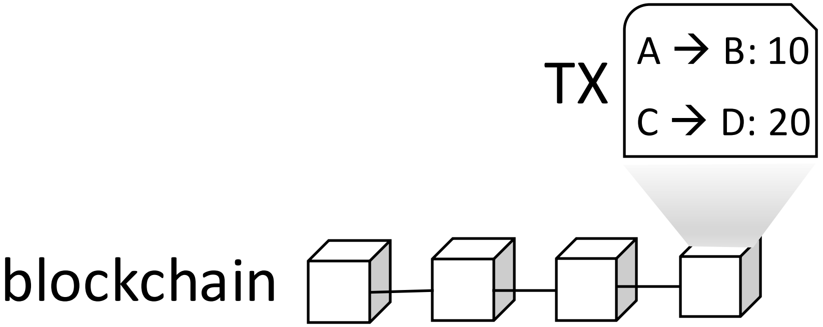

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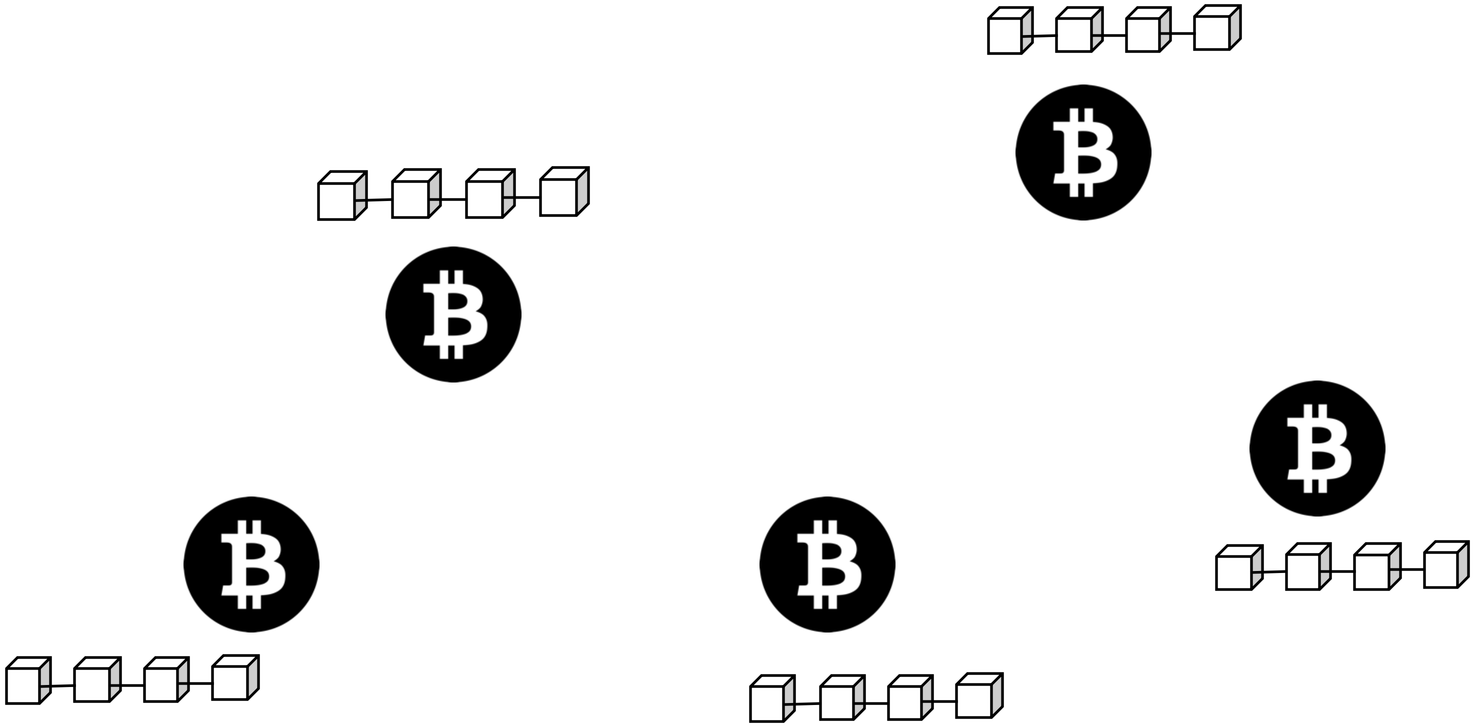

Bitcoin consensus rules

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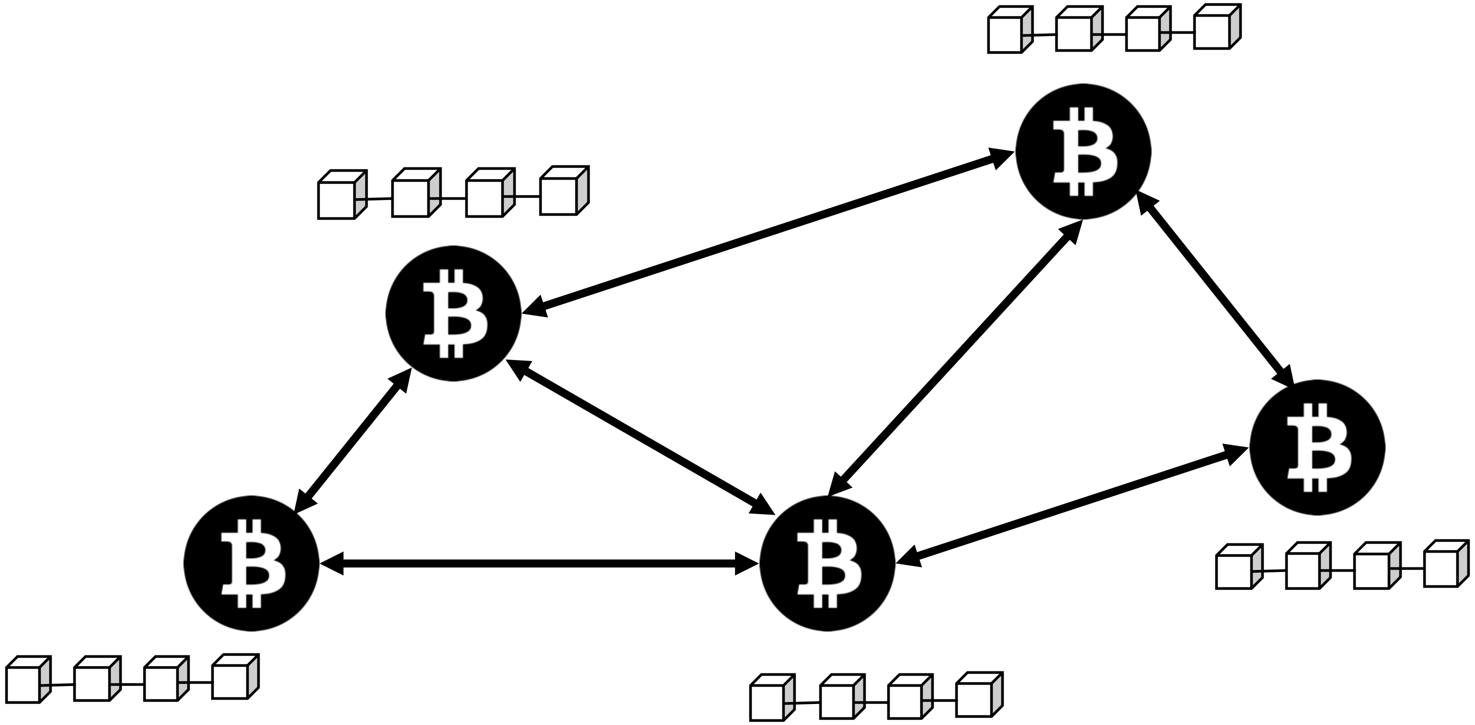

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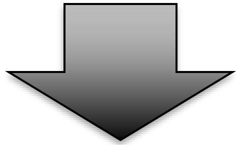

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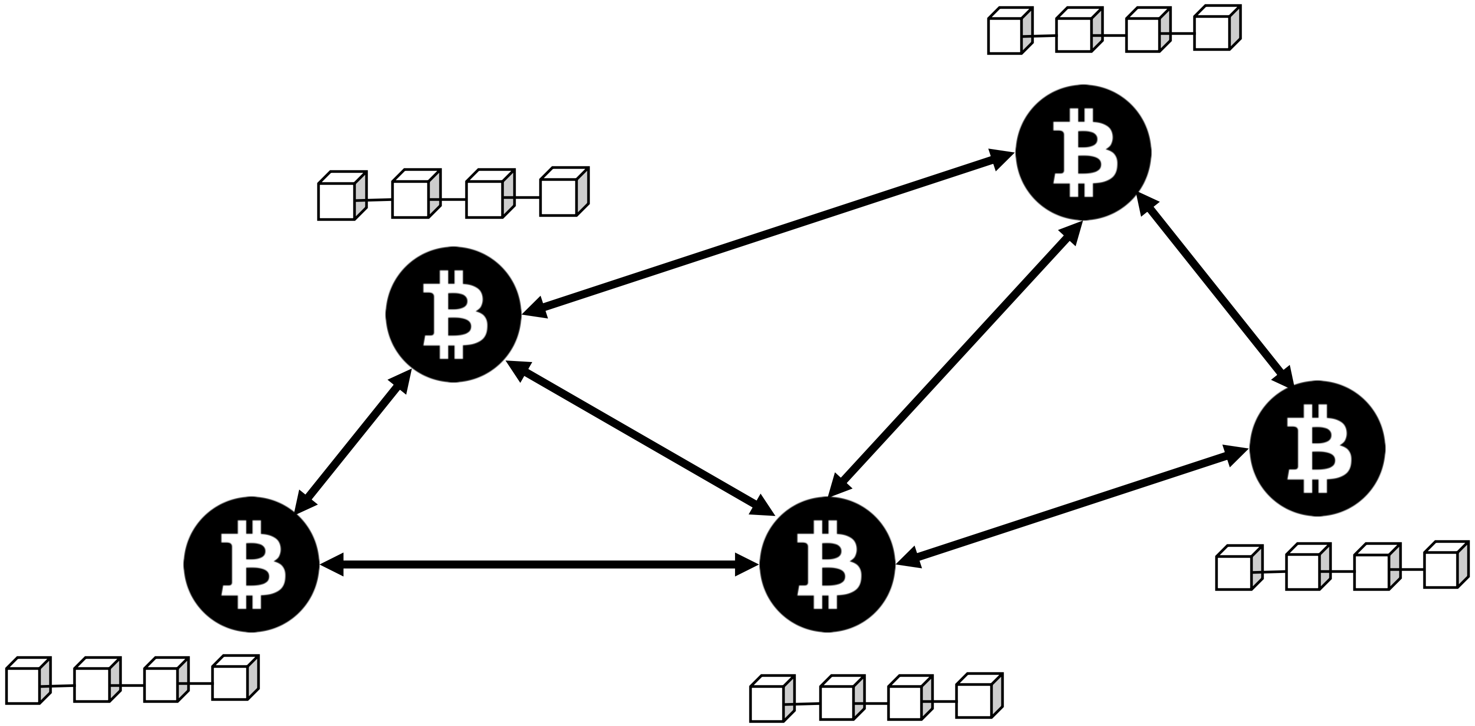

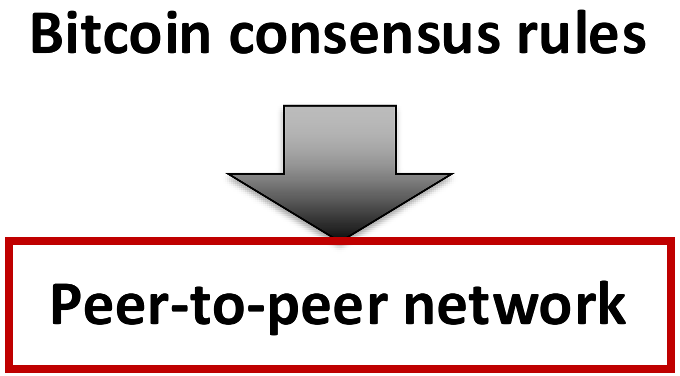

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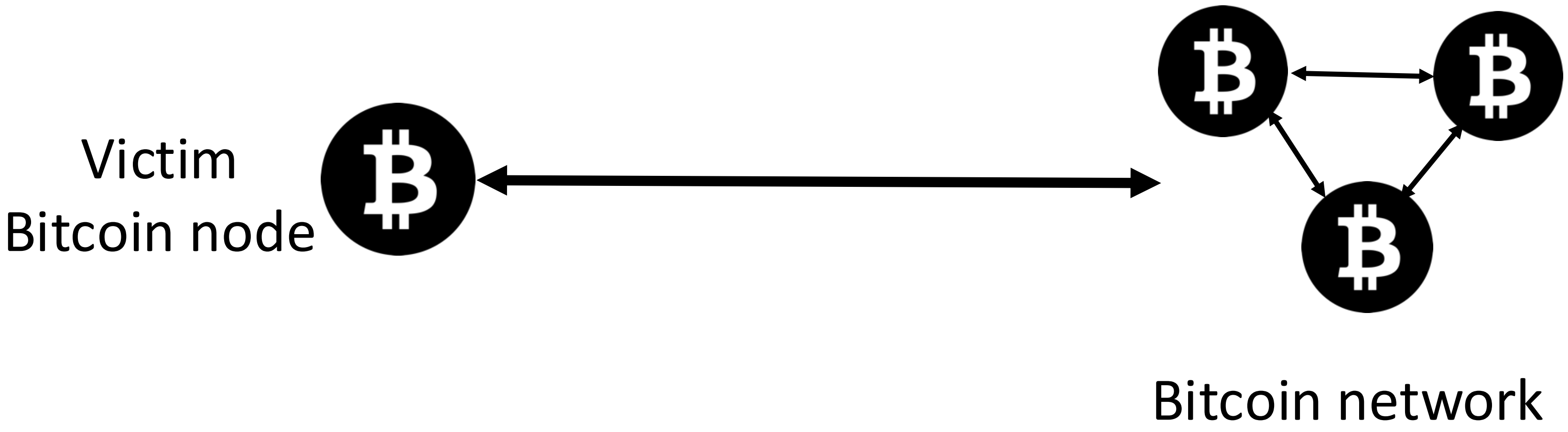
Bitcoin peer-to-peer network can be ***partitioned***



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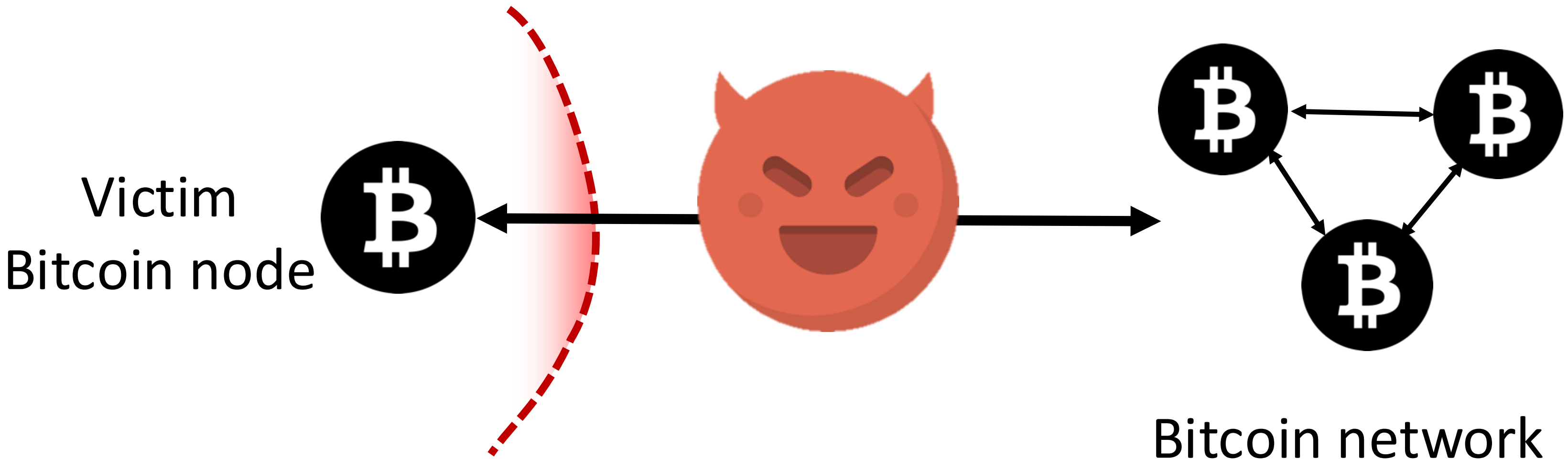
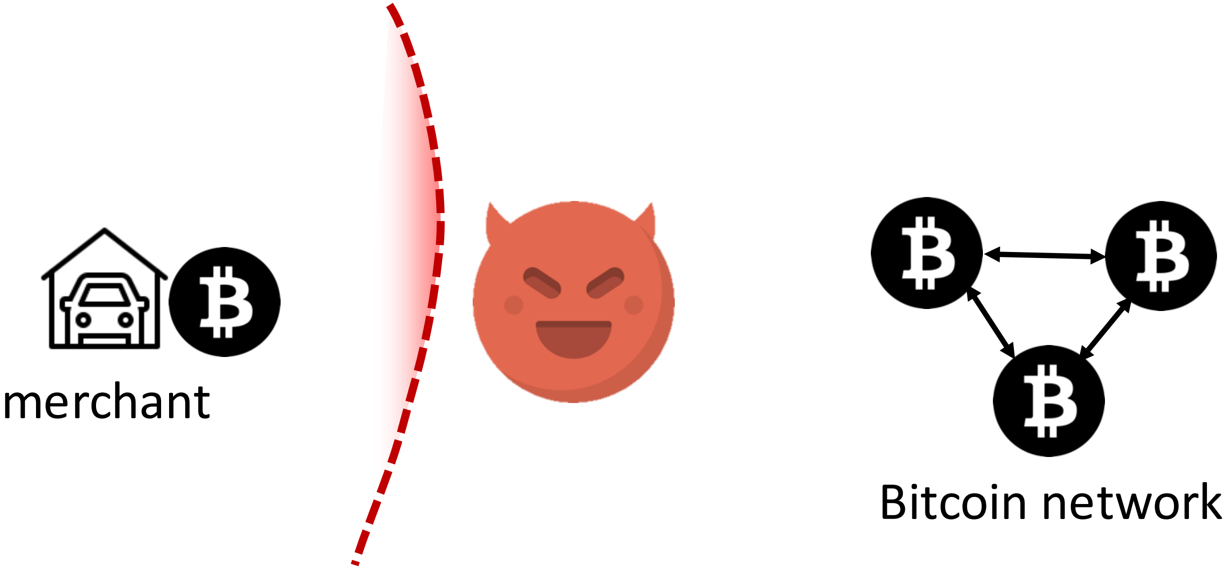


Partitioning attacks: isolate victim node(s) from the rest of network

Partitioning attack is a ***dangerous*** threat



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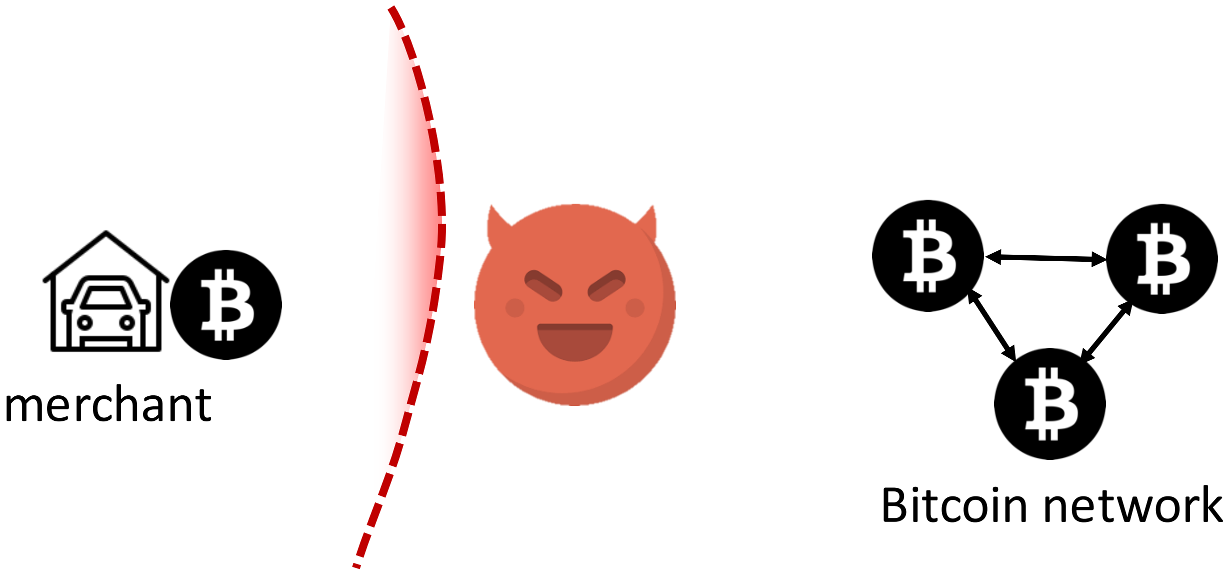

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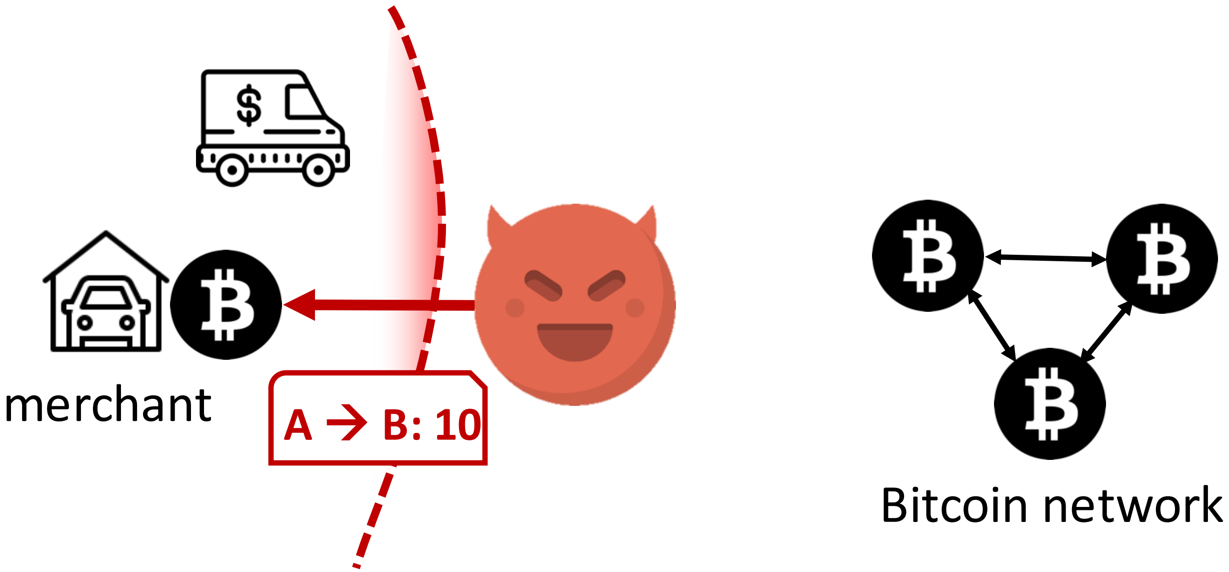

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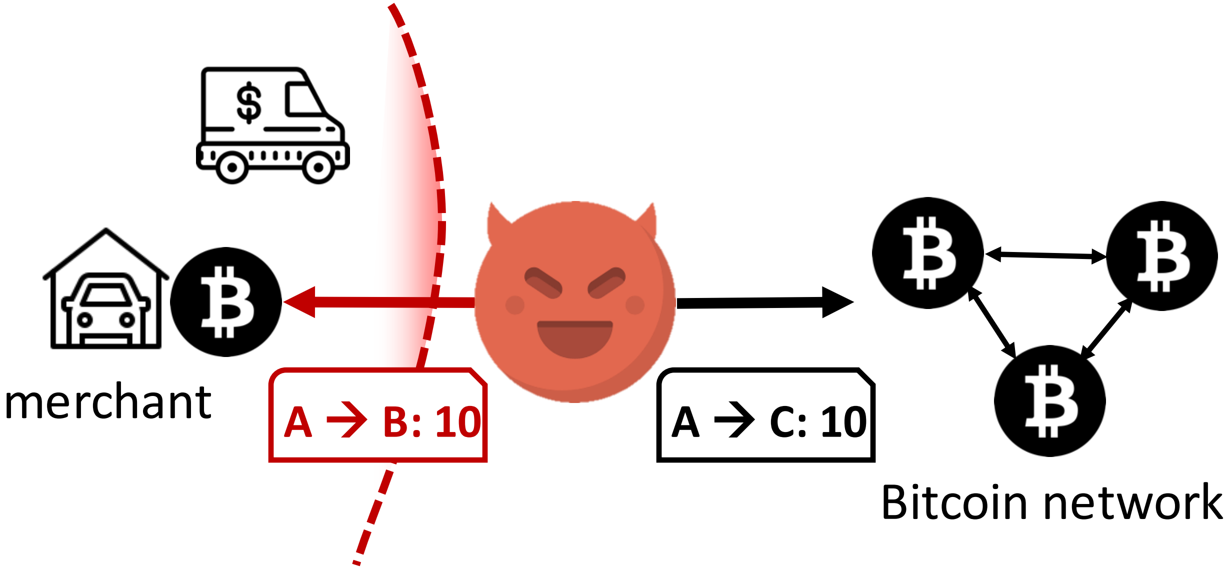

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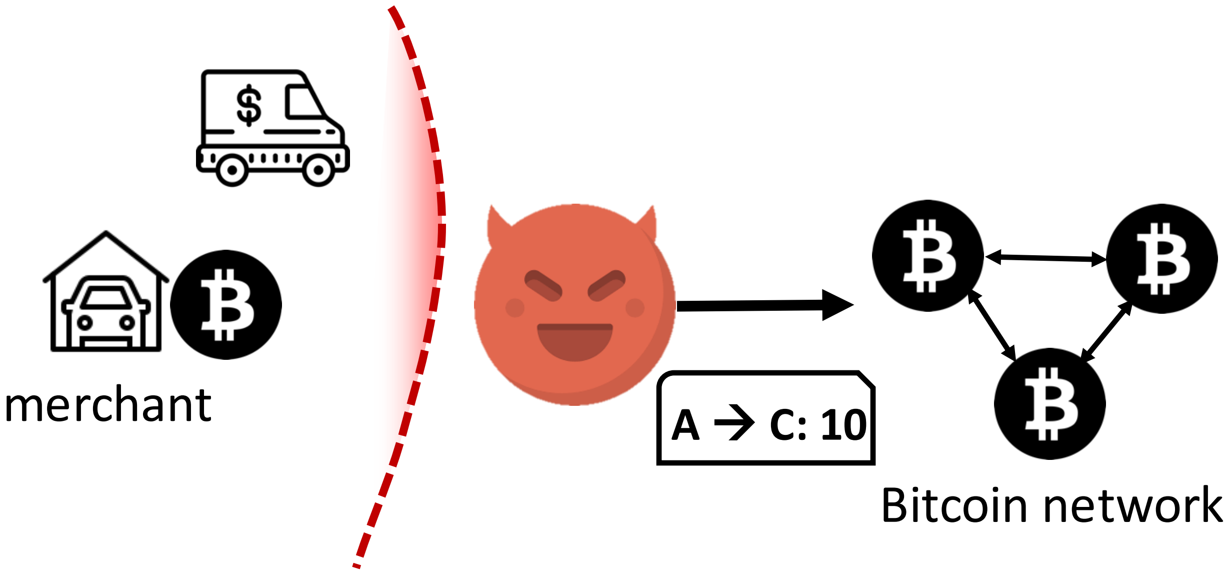

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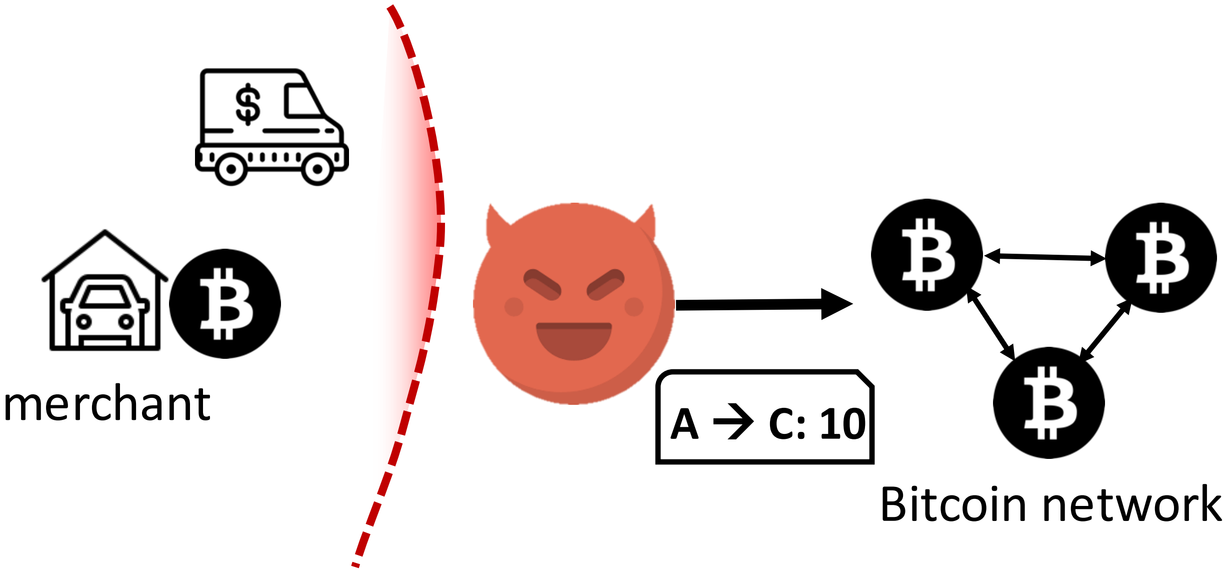

Partitioning ***enables/improves*** several other attacks:

- ✓ 51% attack
- ✓ selfish mining
- ✓ censoring transactions
- ✓ take down cryptocurrencies
- ✓ …

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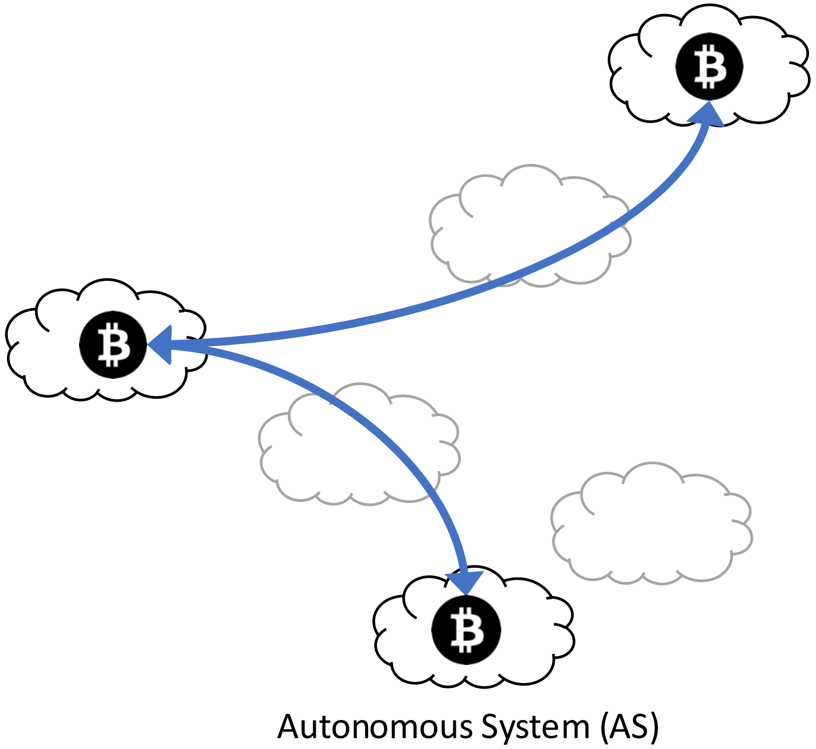
Previous attack: ***routing manipulation*** to partition Bitcoin’s peer-to-peer network



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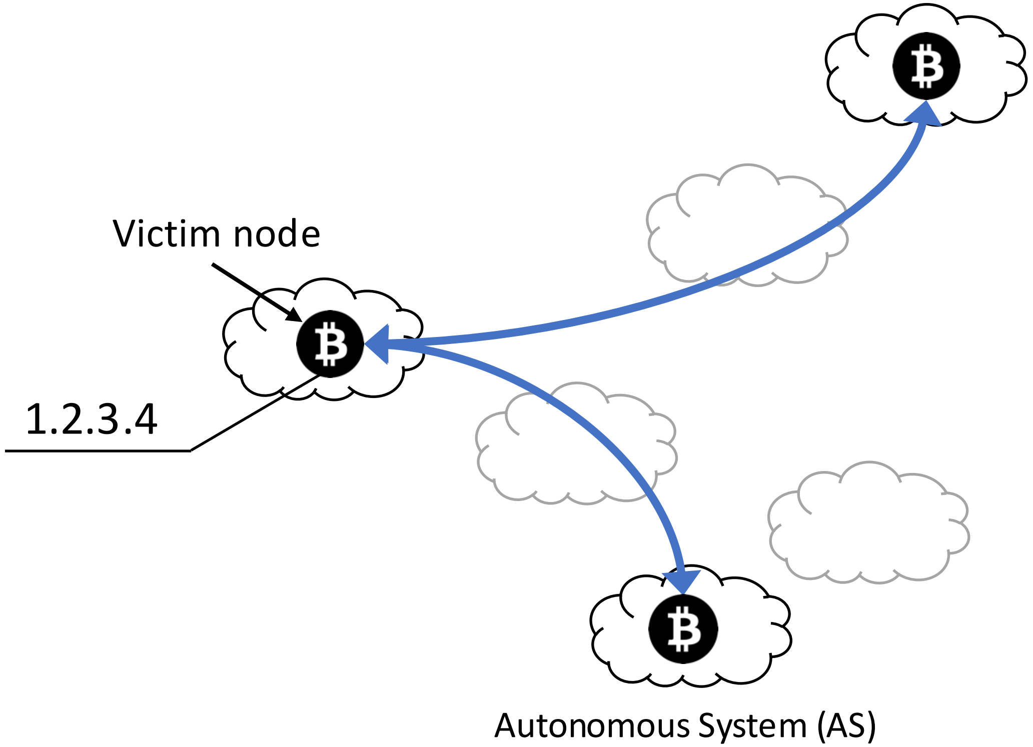

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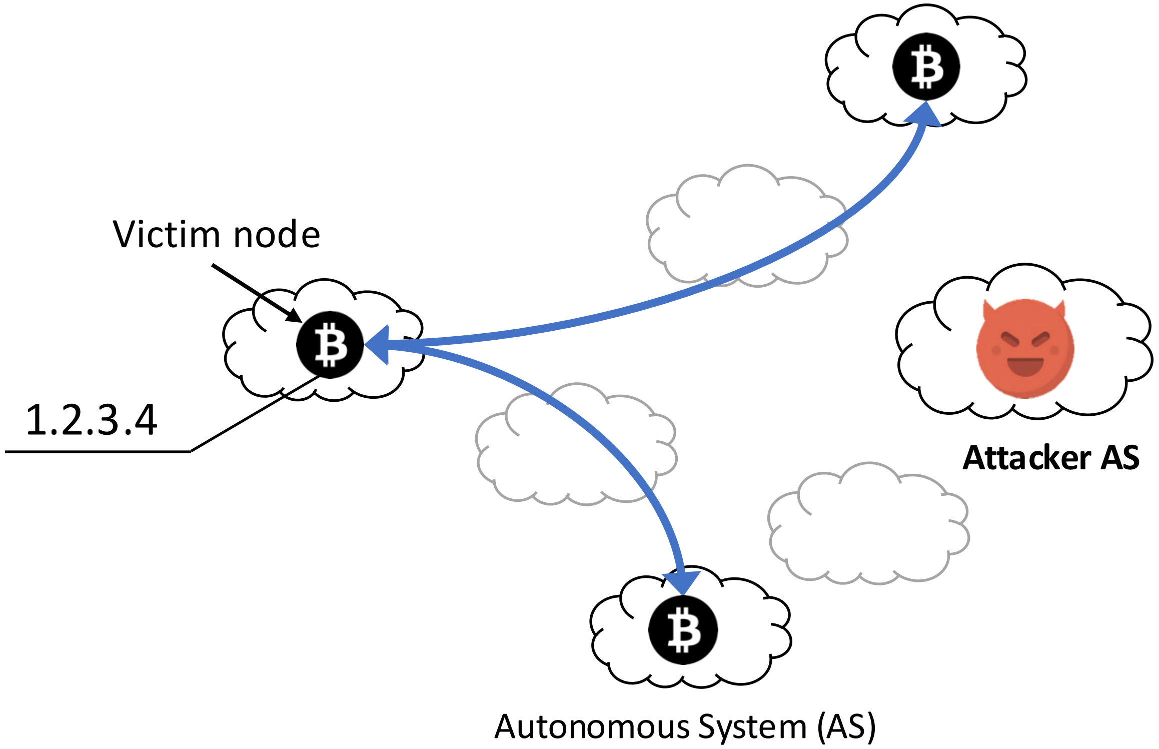

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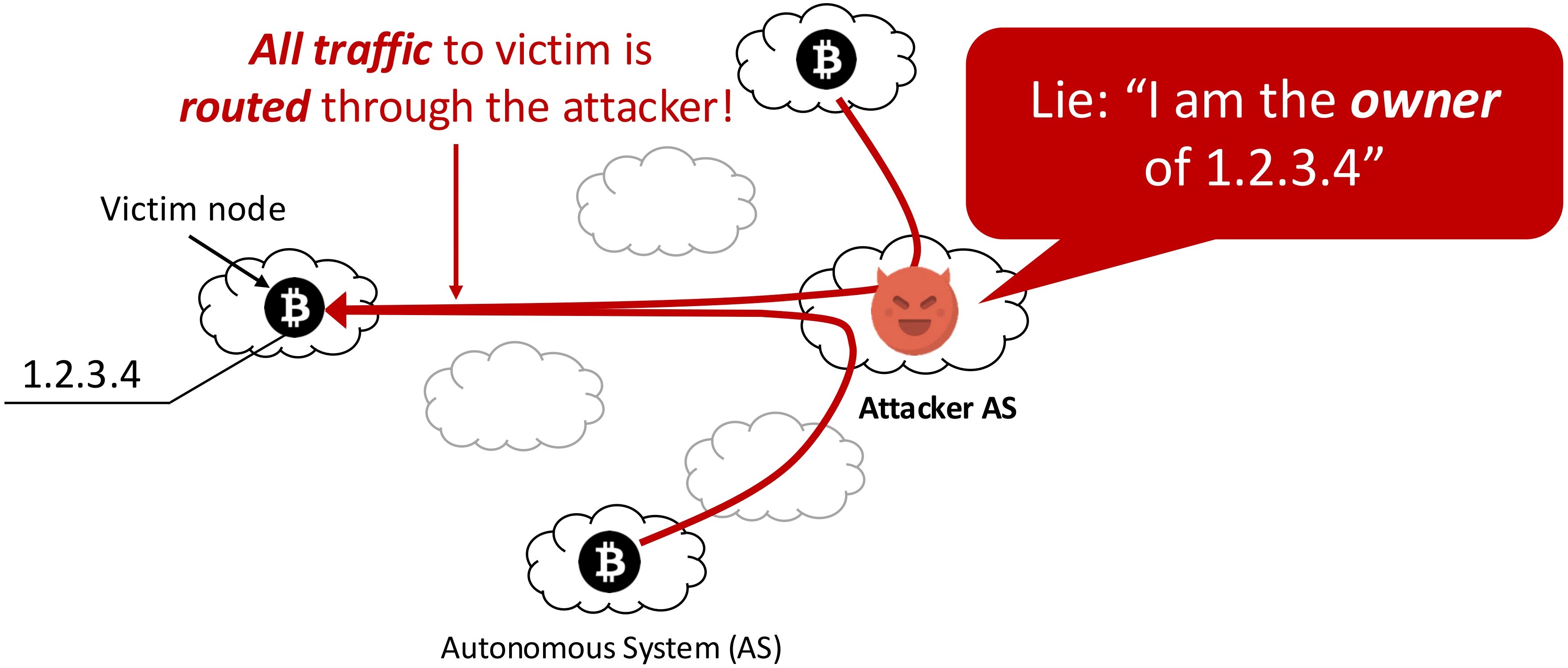

All traffic to victim is ***routed*** through the attacker!
Lie: "I am the ***owner*** of 1.2.3.4"
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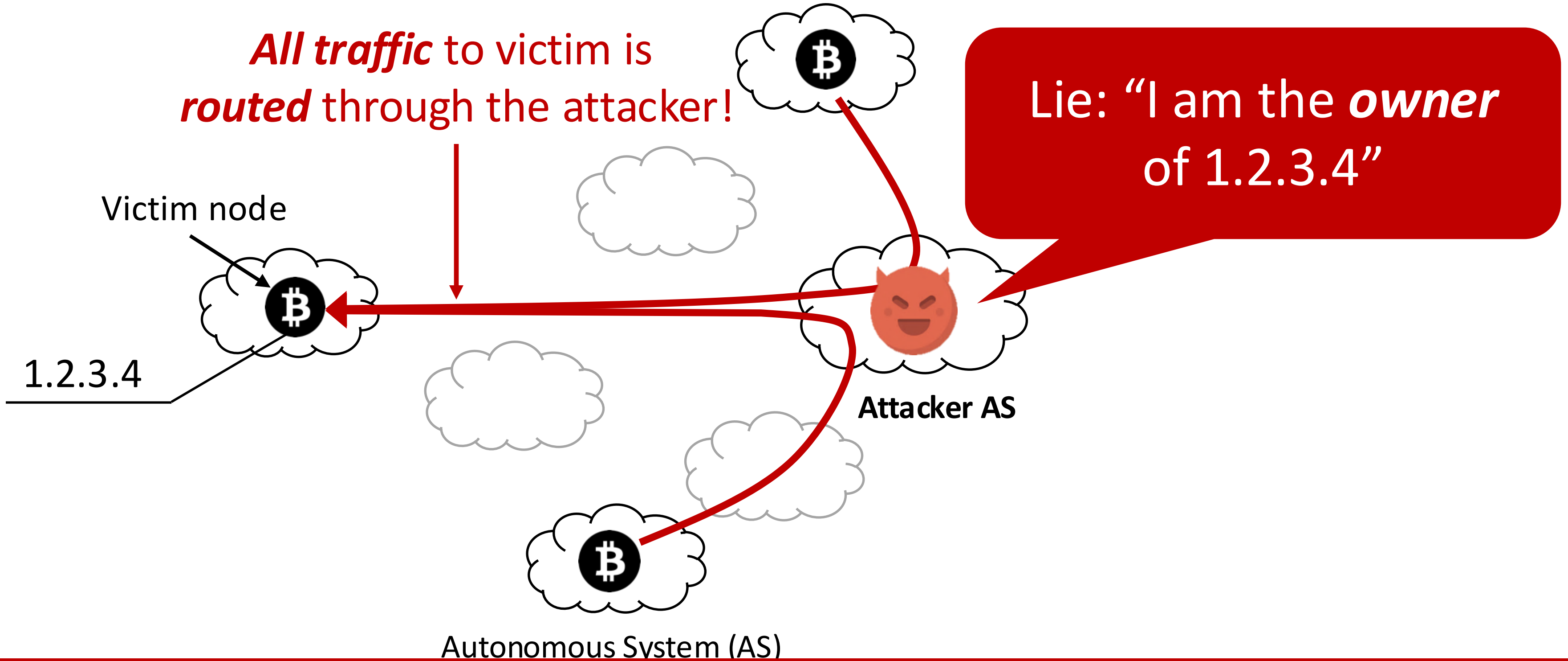

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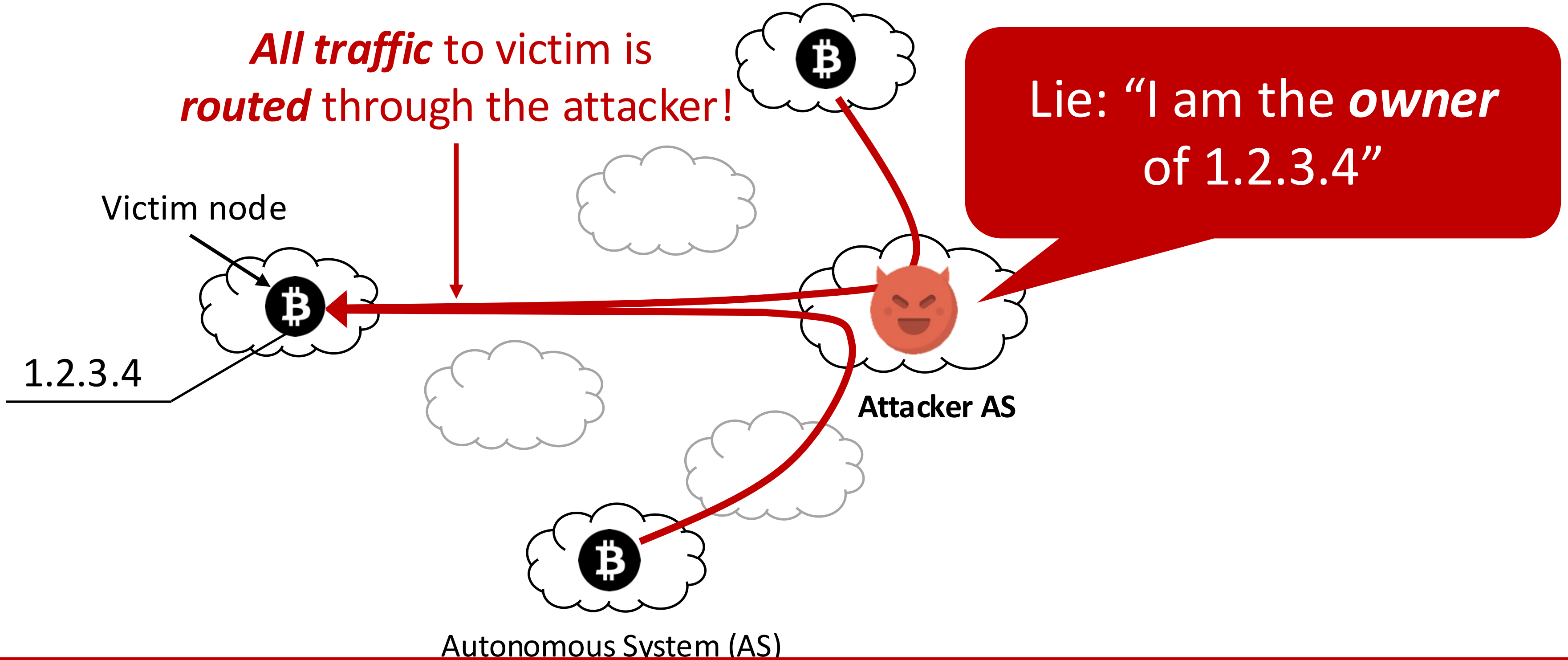

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✓ **Question: " *Do they really launch this attack in practice?*"**

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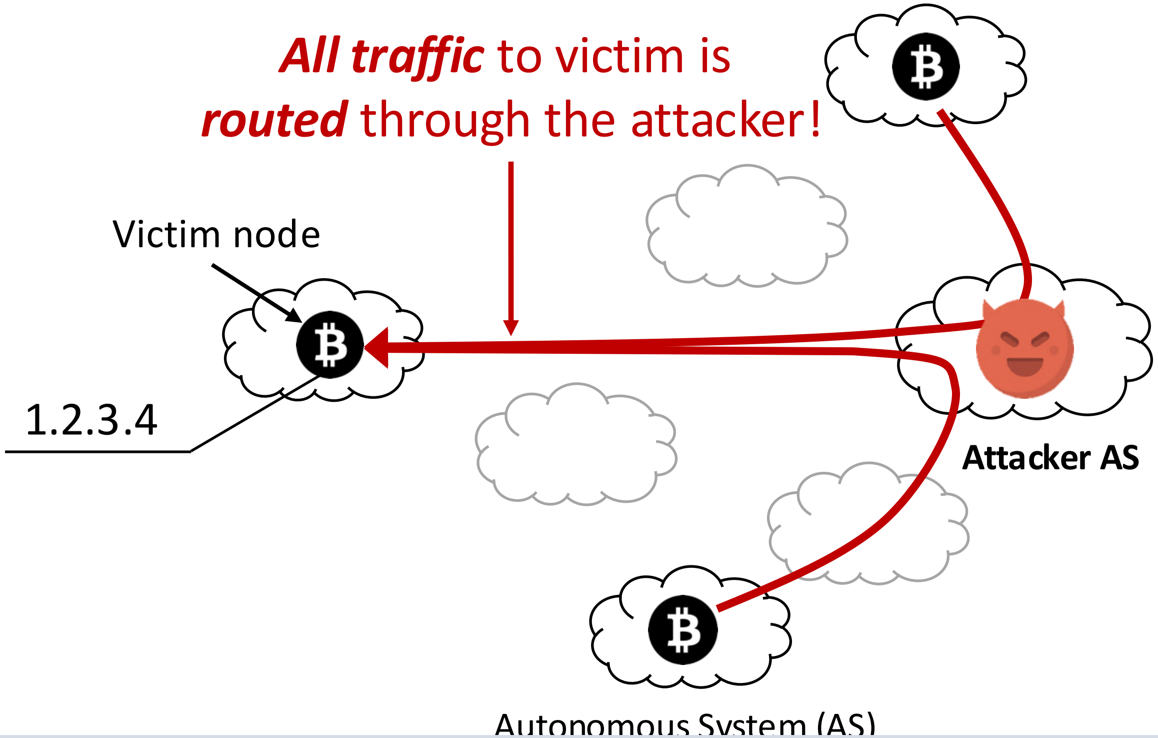

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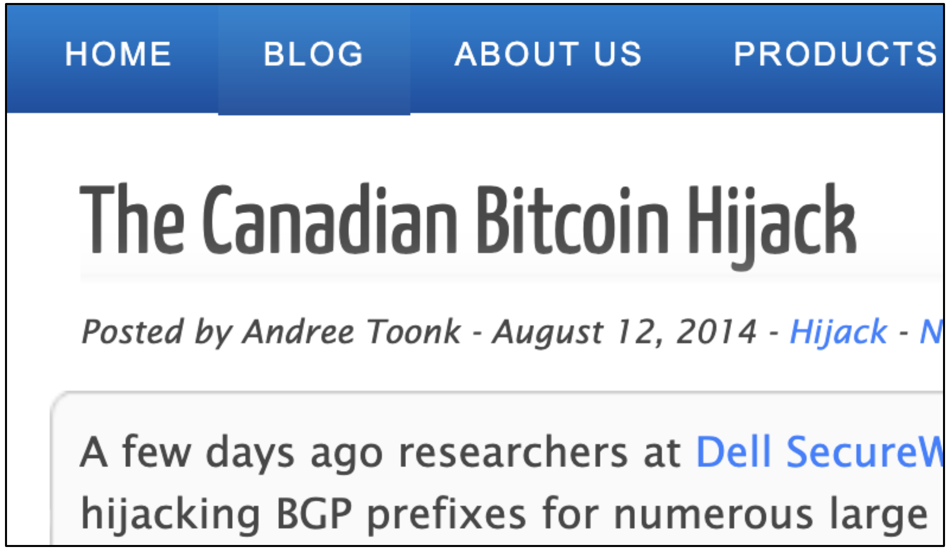

The Canadian Bitcoin Hijack

Posted by Andree Toonk - August 12, 2014 - Hijack - N

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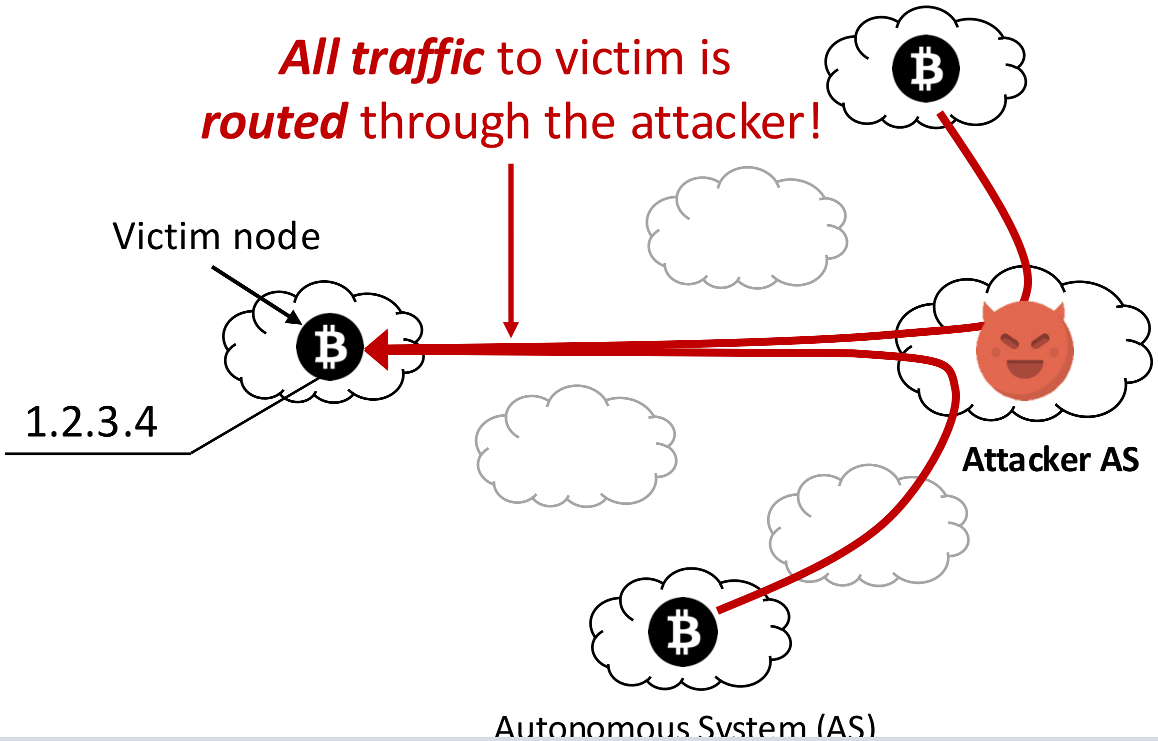

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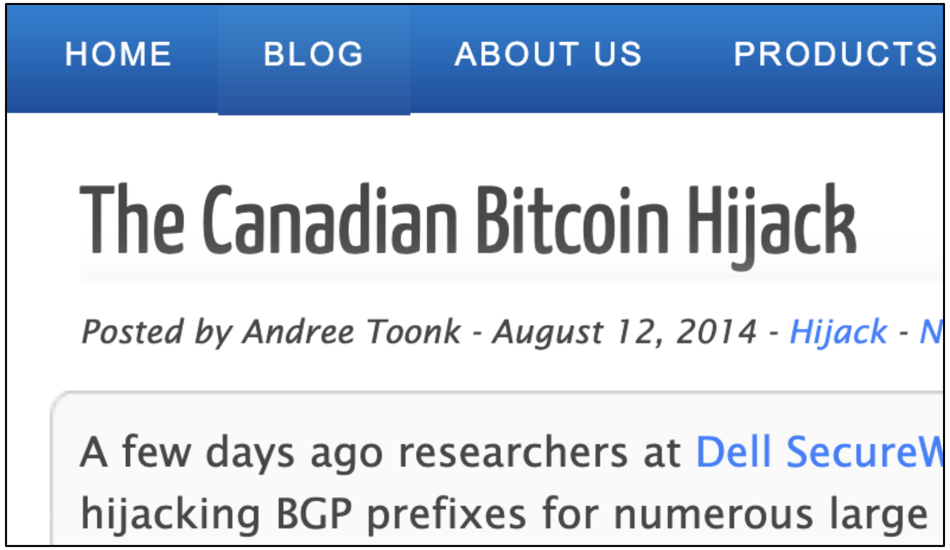

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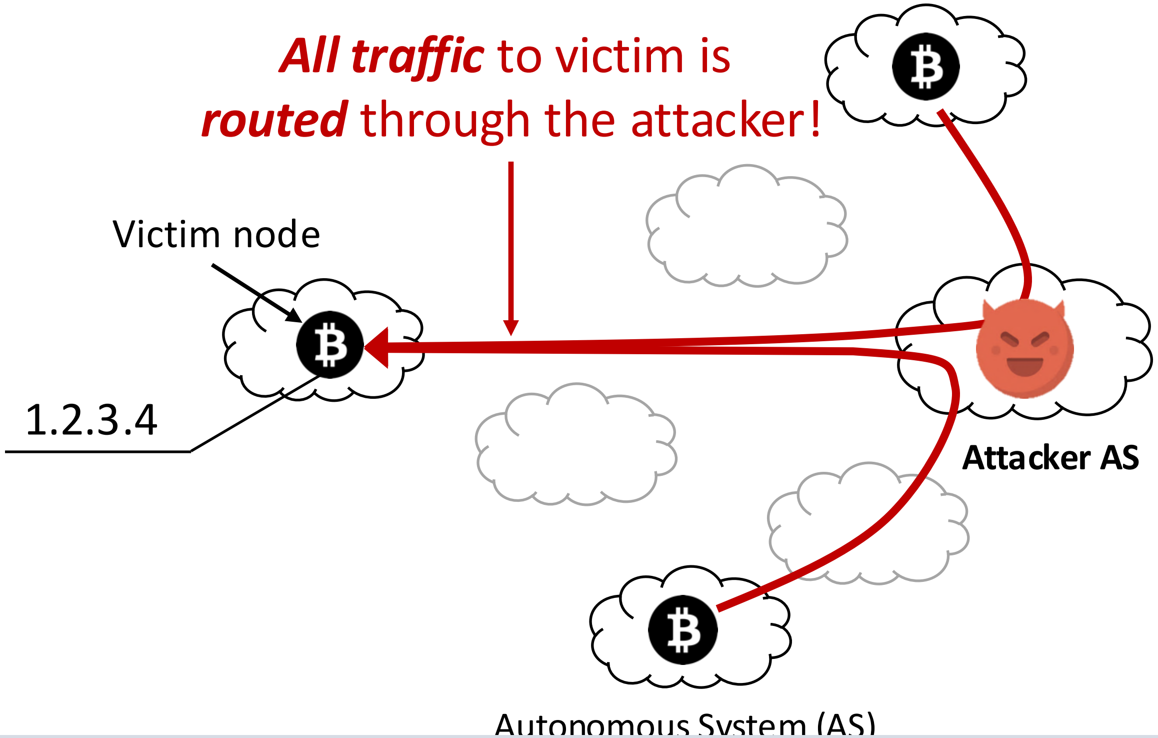
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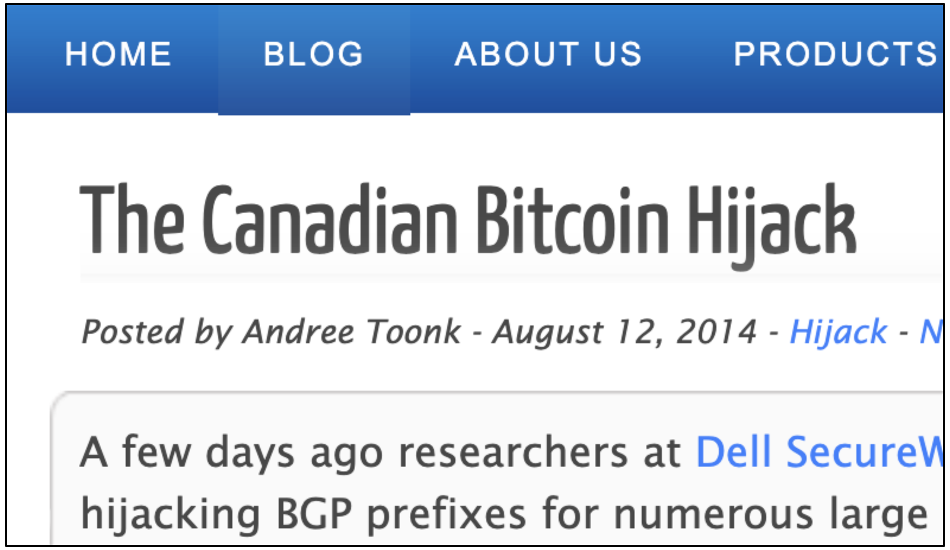

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- Attacker’s ***identity*** (AS number) is ***revealed***

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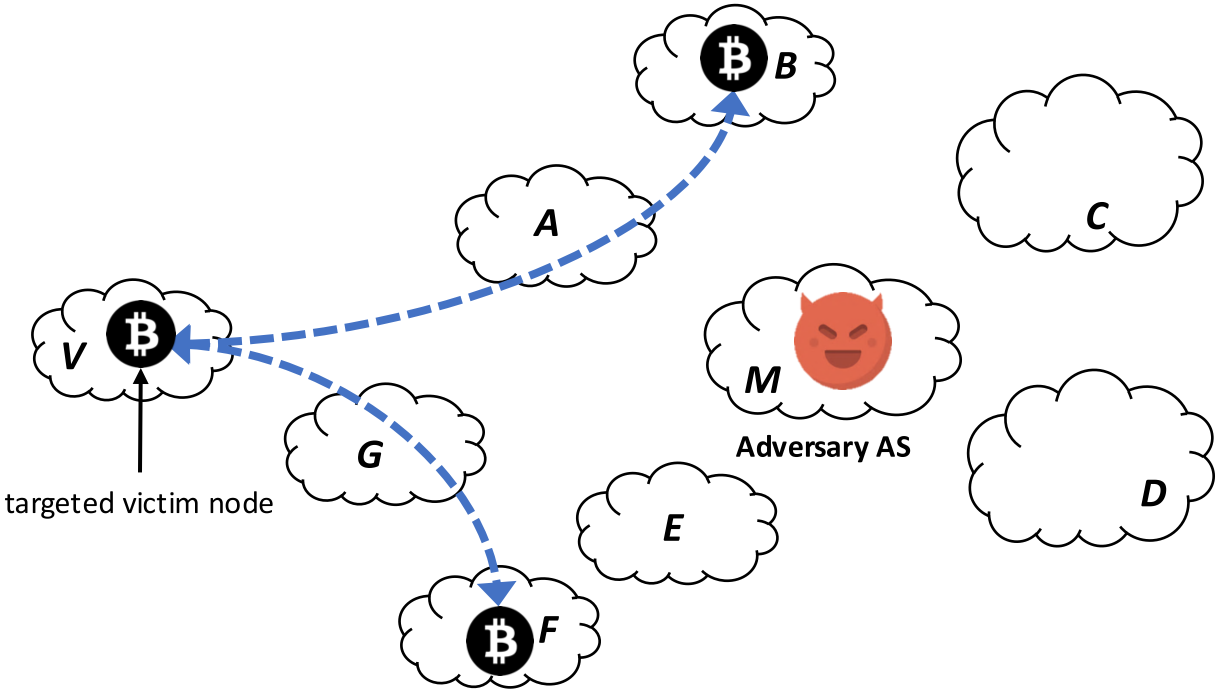

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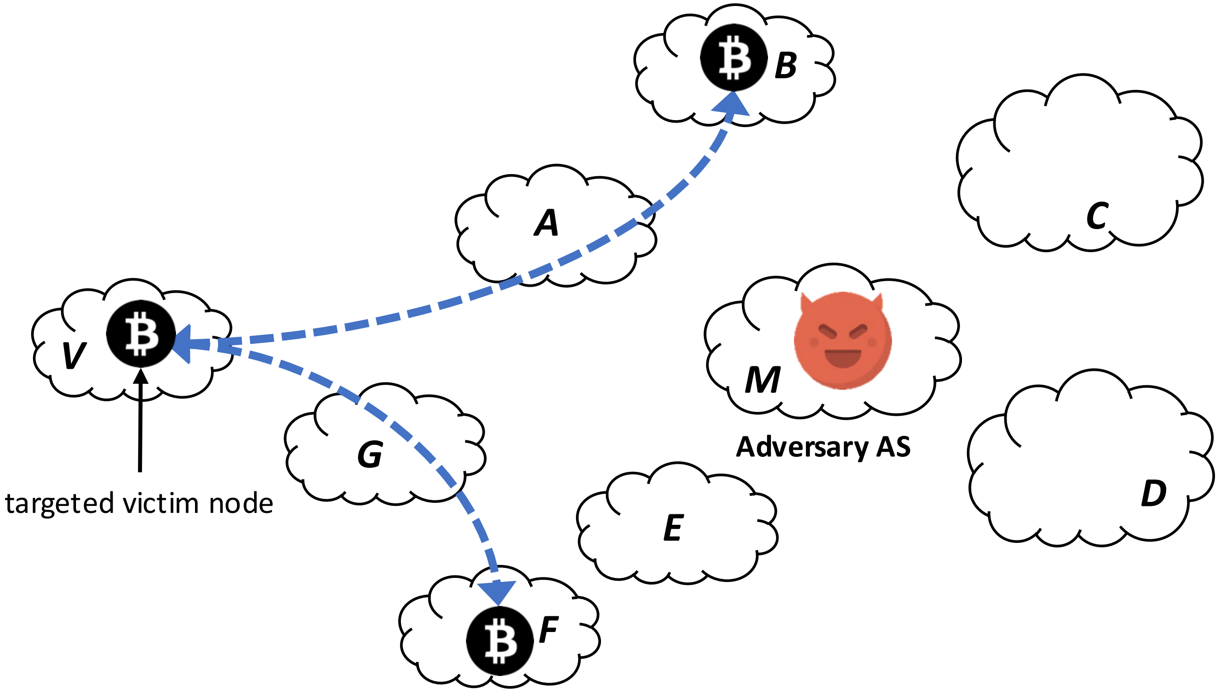

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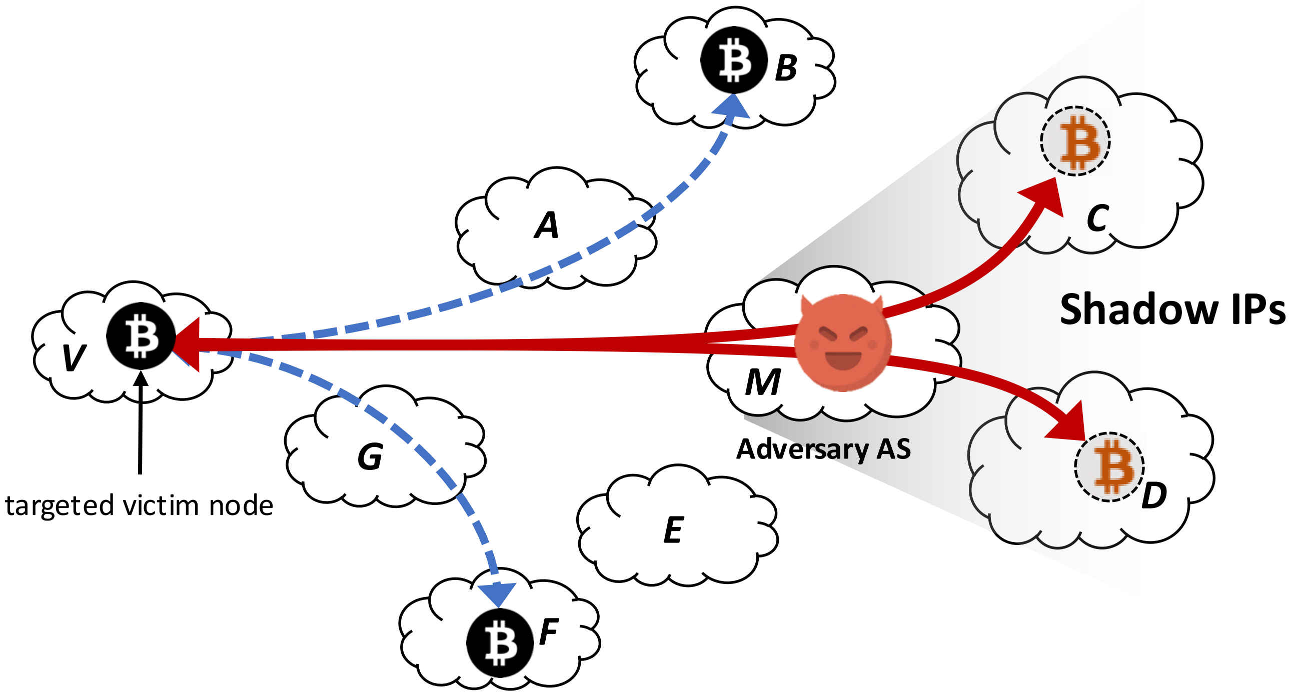

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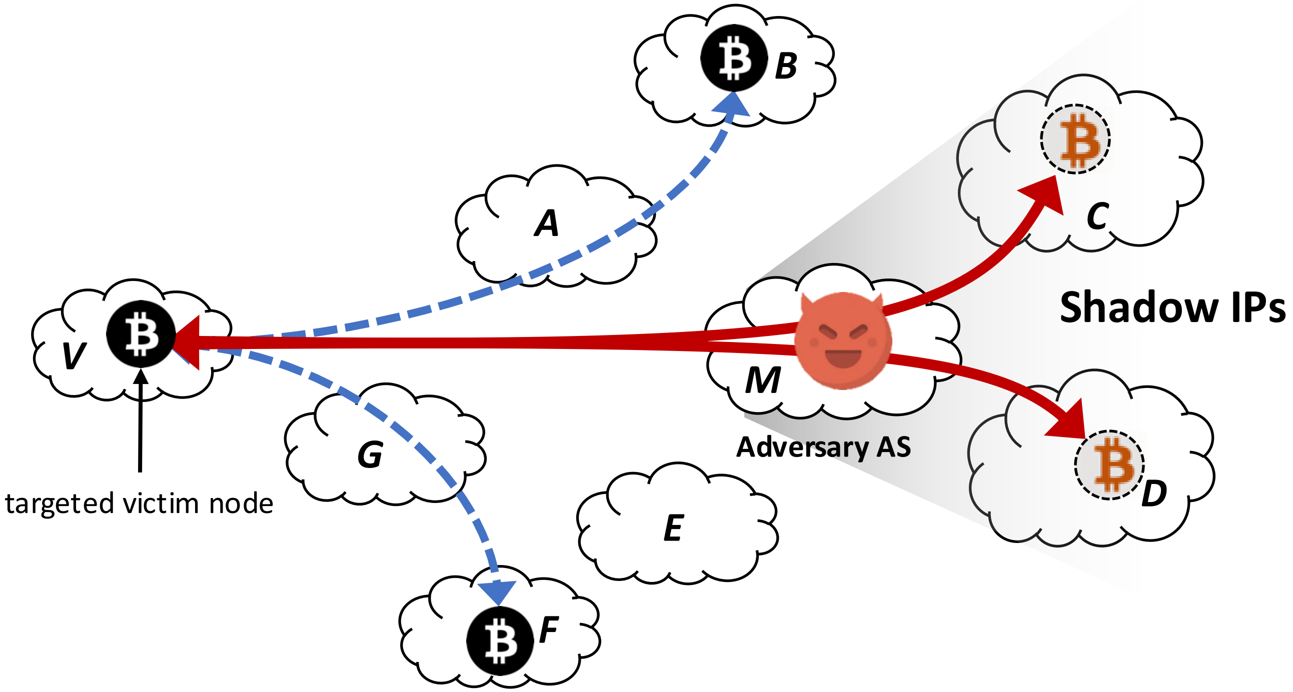

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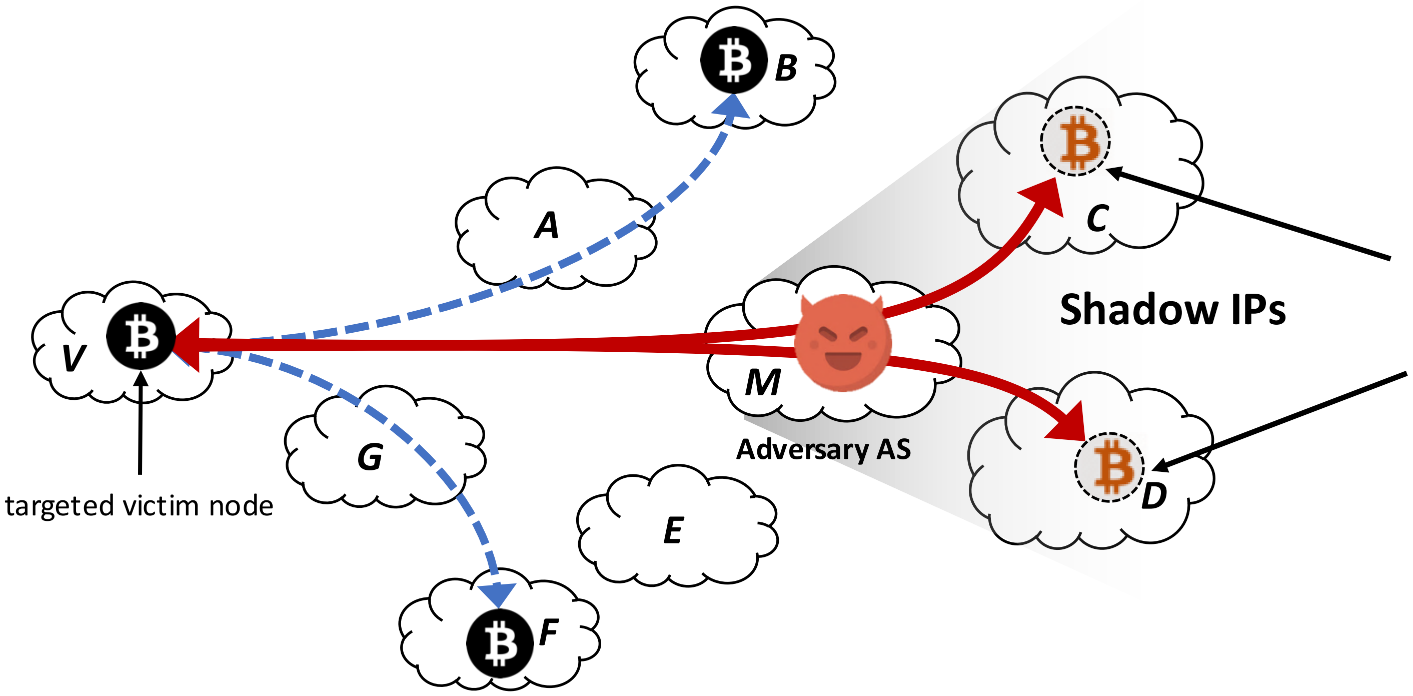

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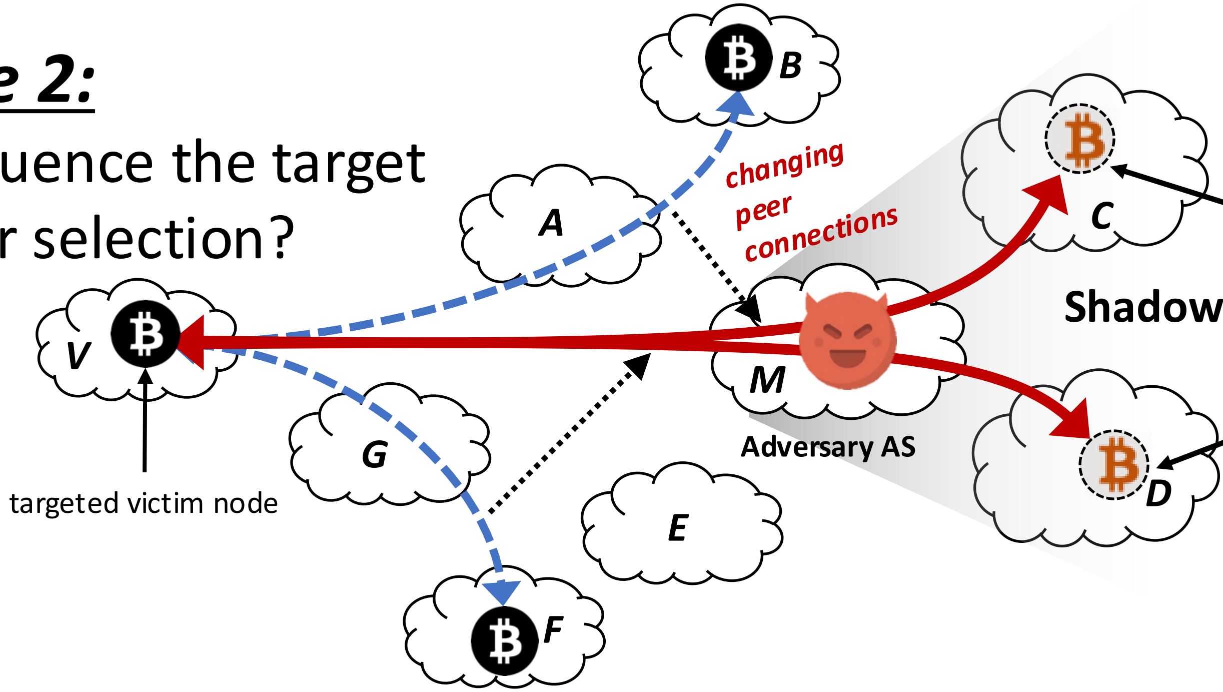
Challenge 2:

How to influence the target node's peer selection?



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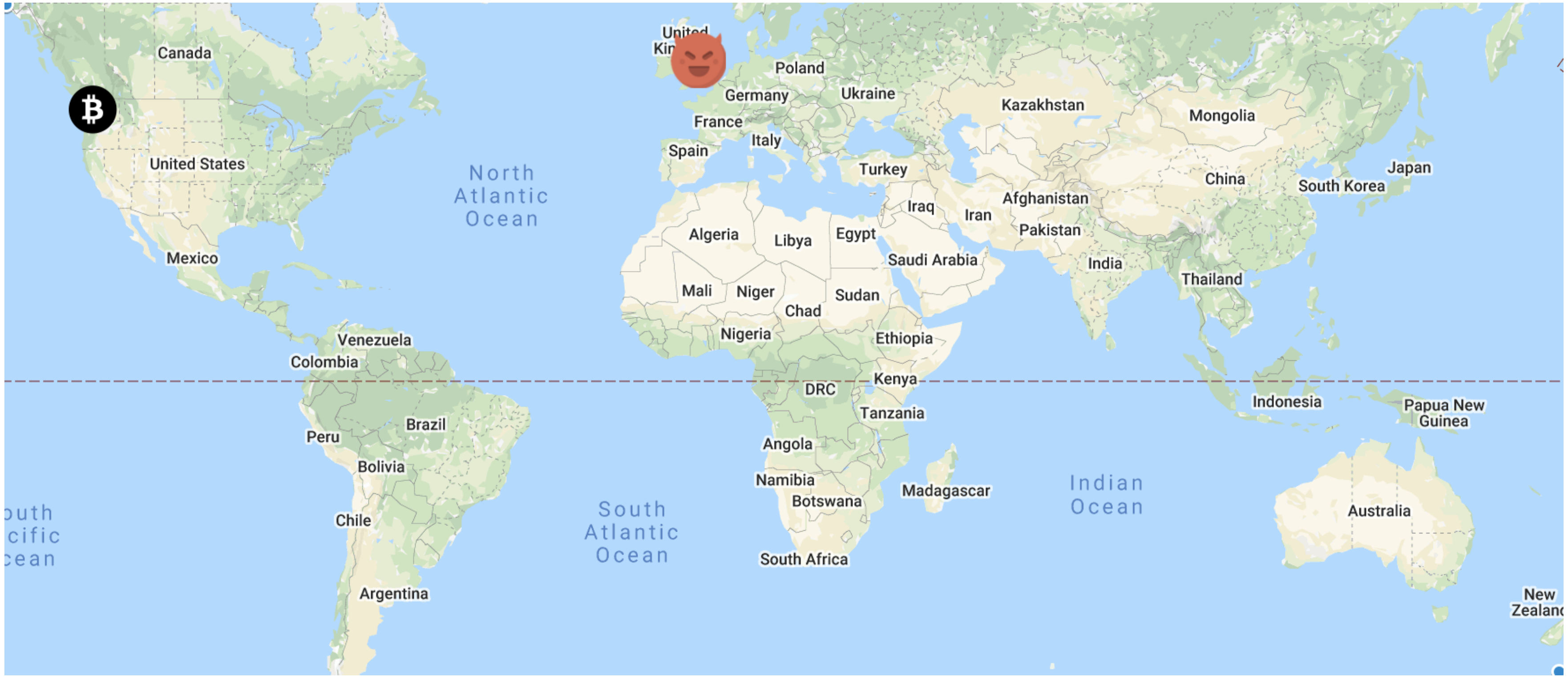

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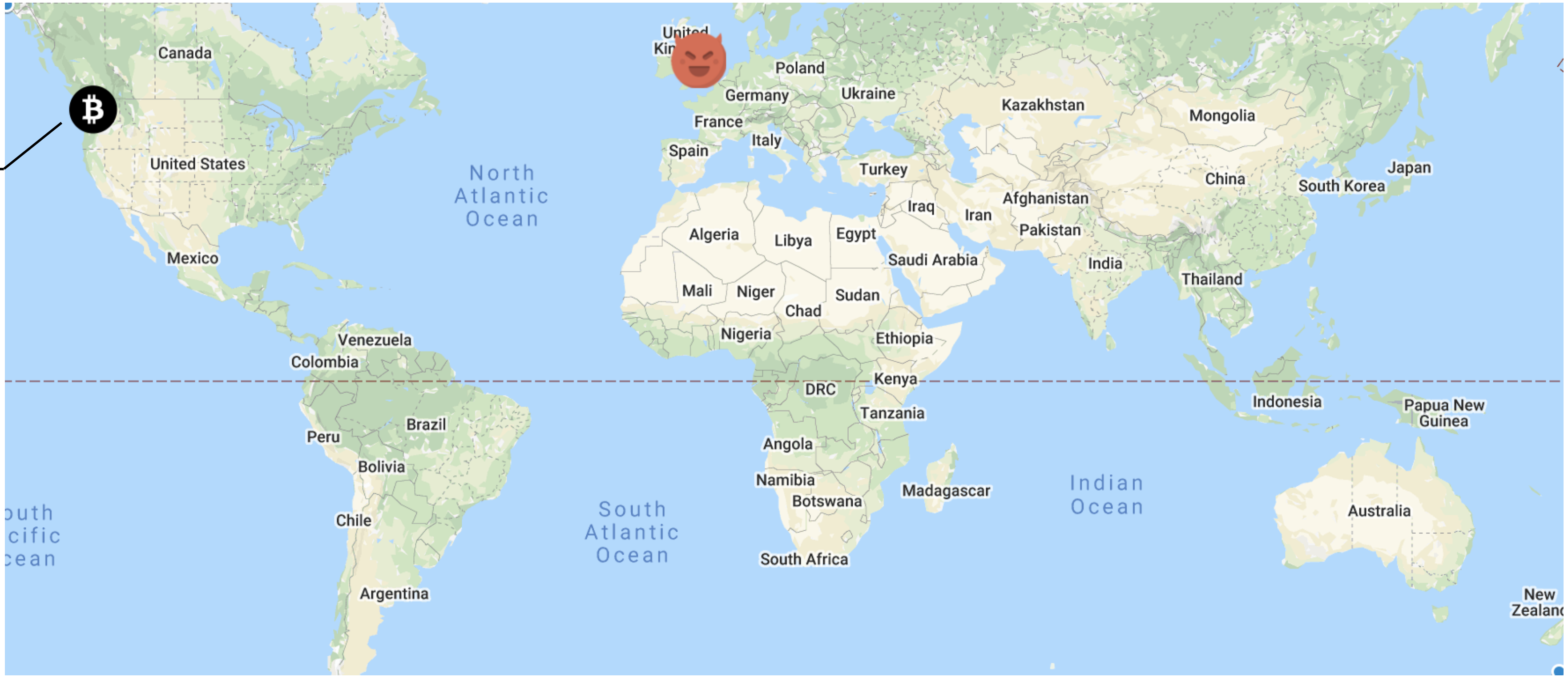

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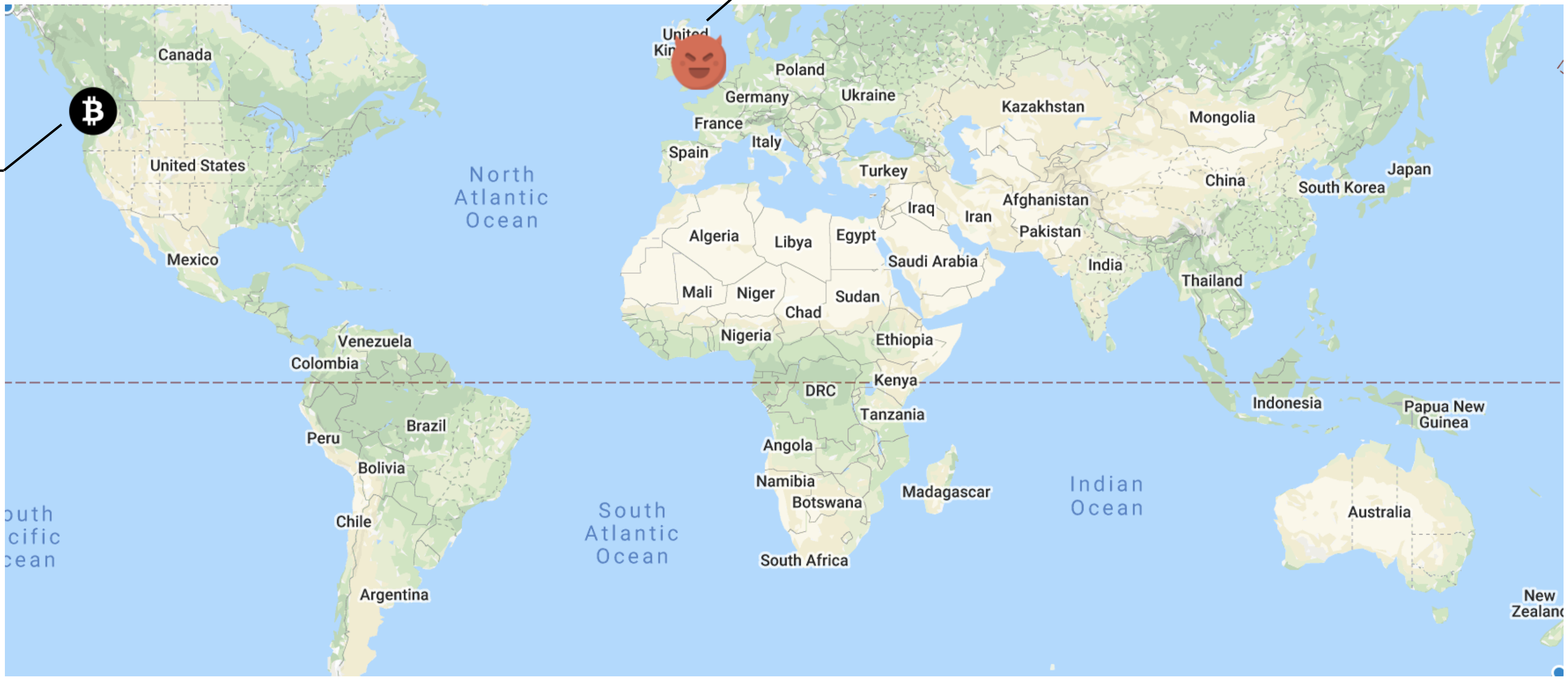

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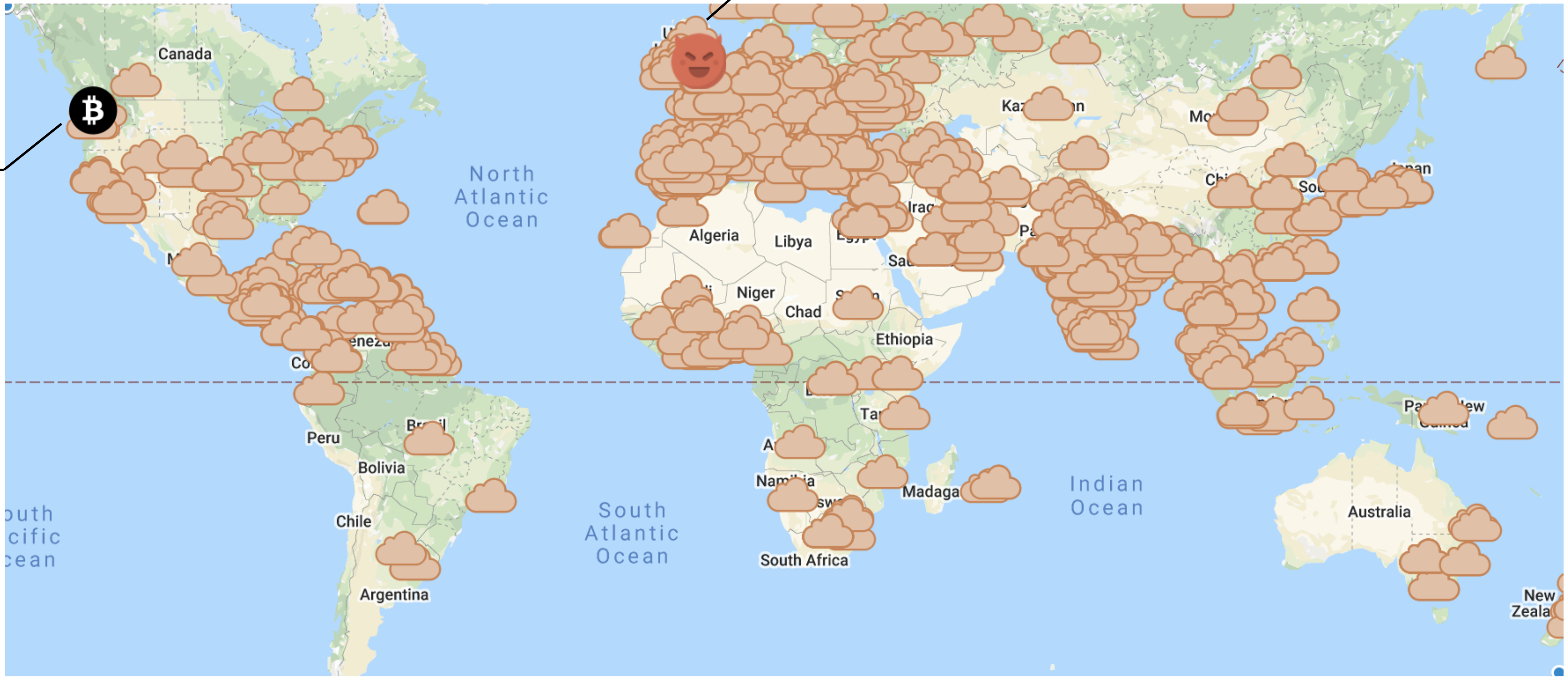

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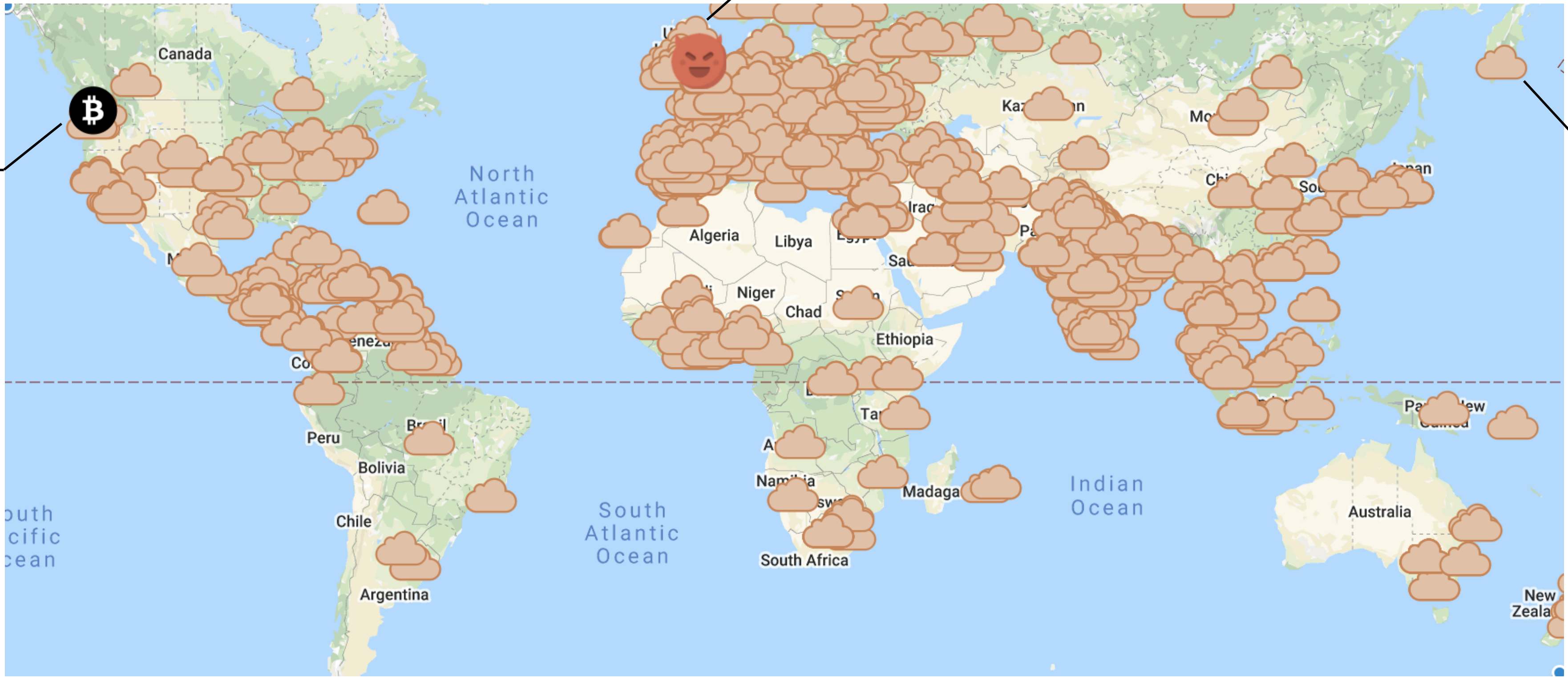

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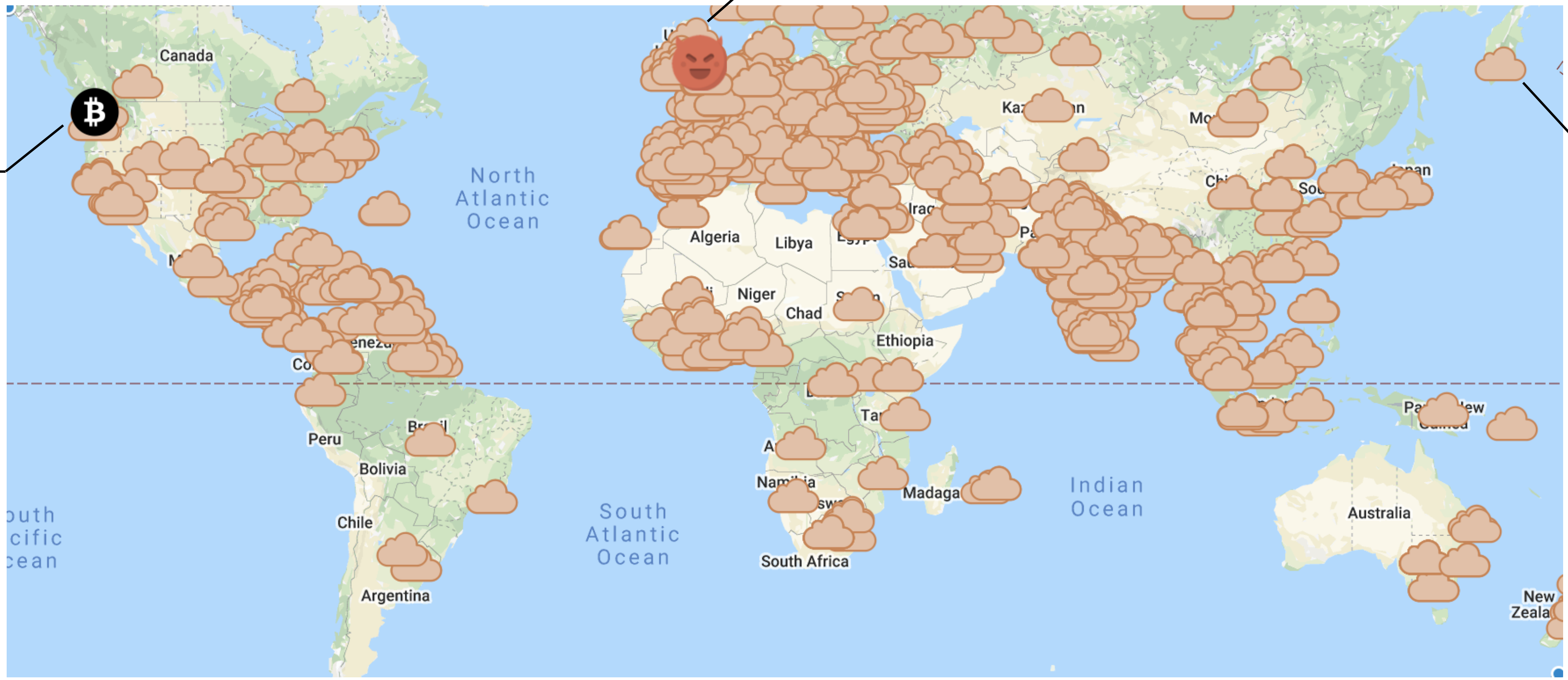

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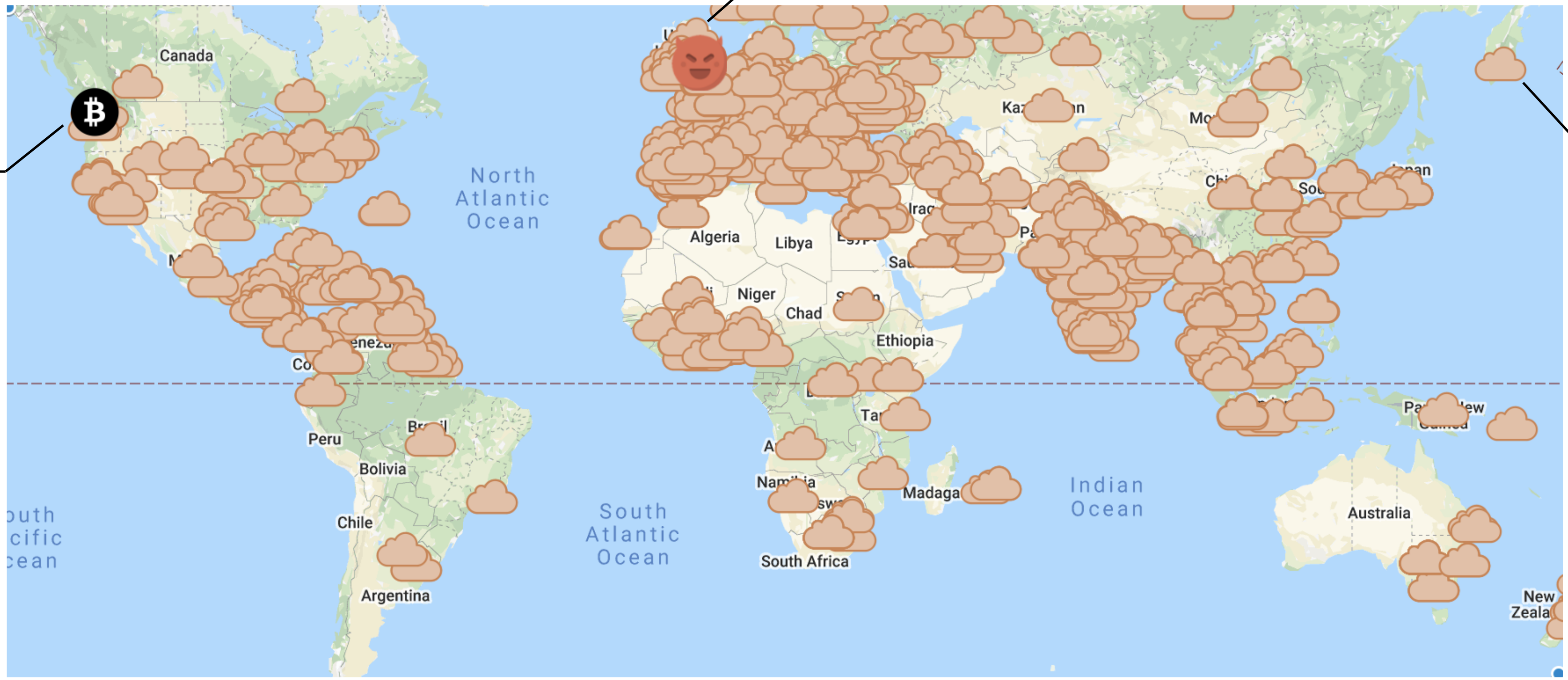

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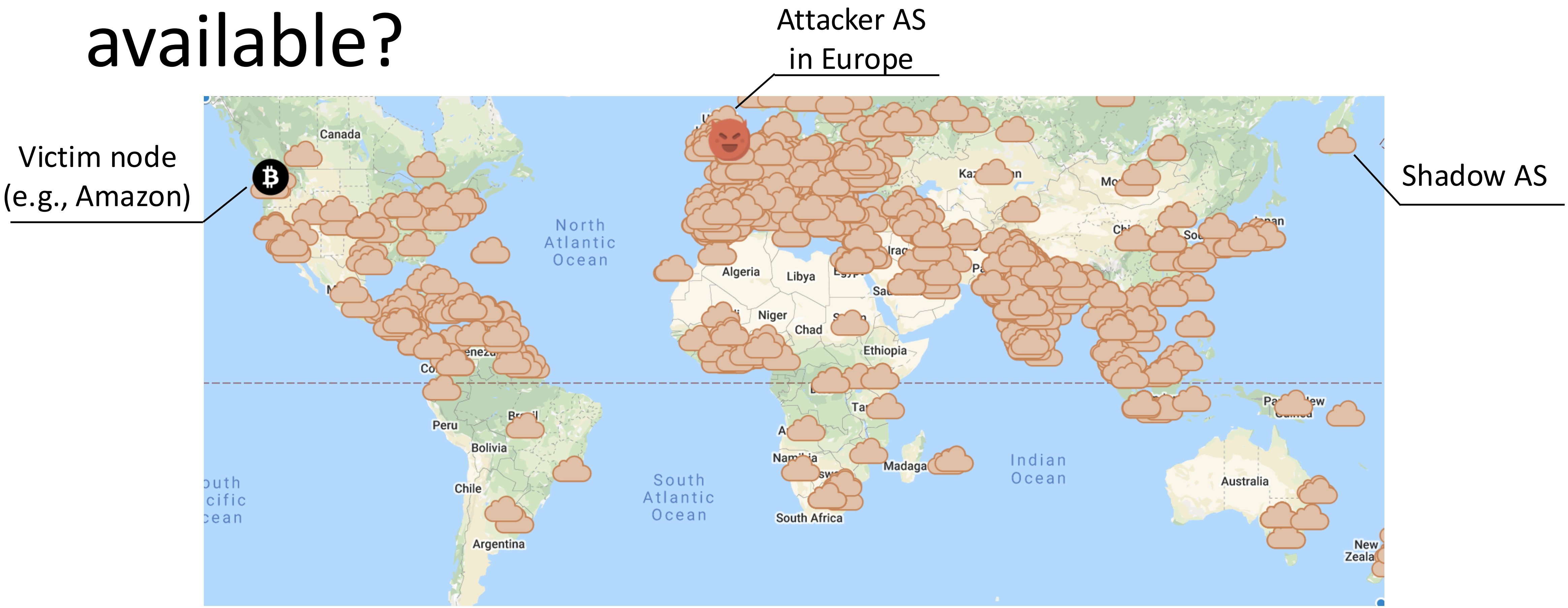

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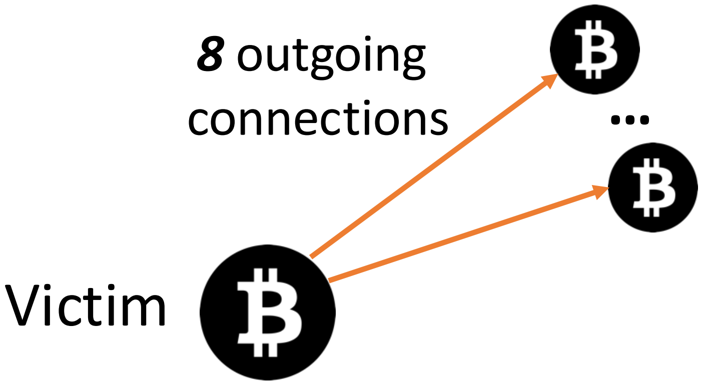

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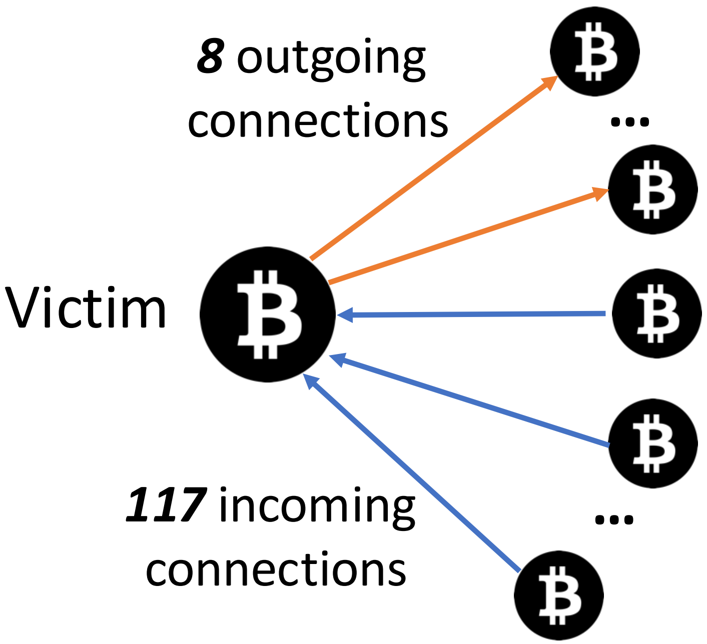

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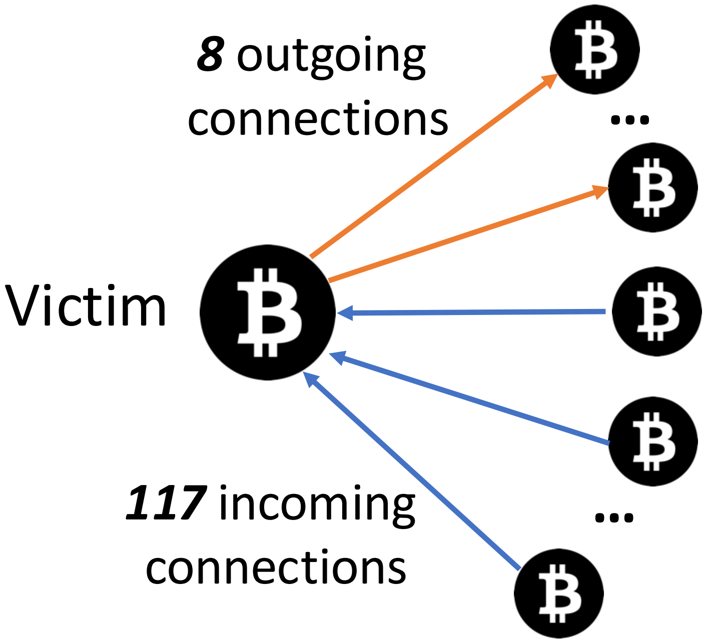

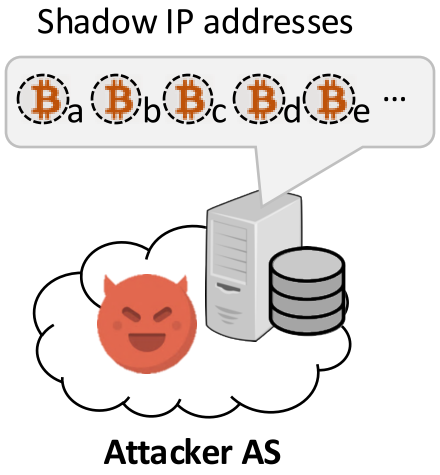

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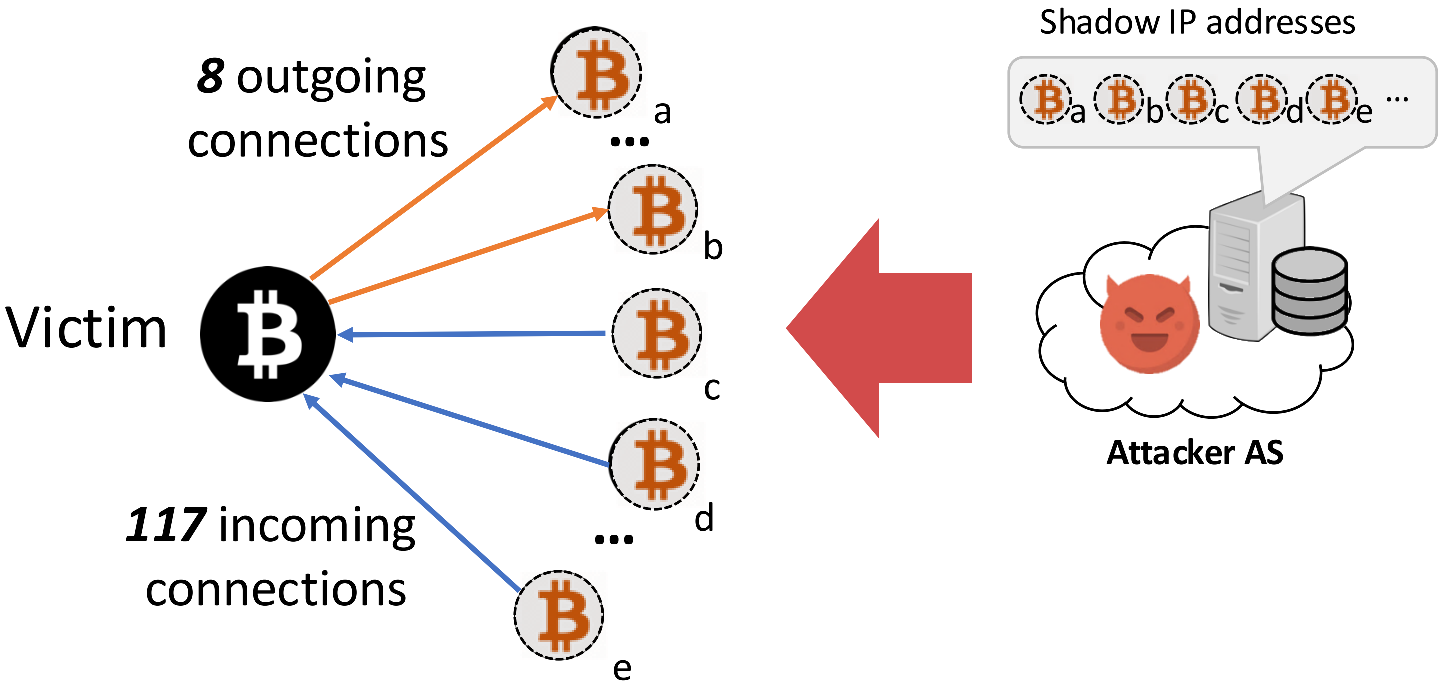

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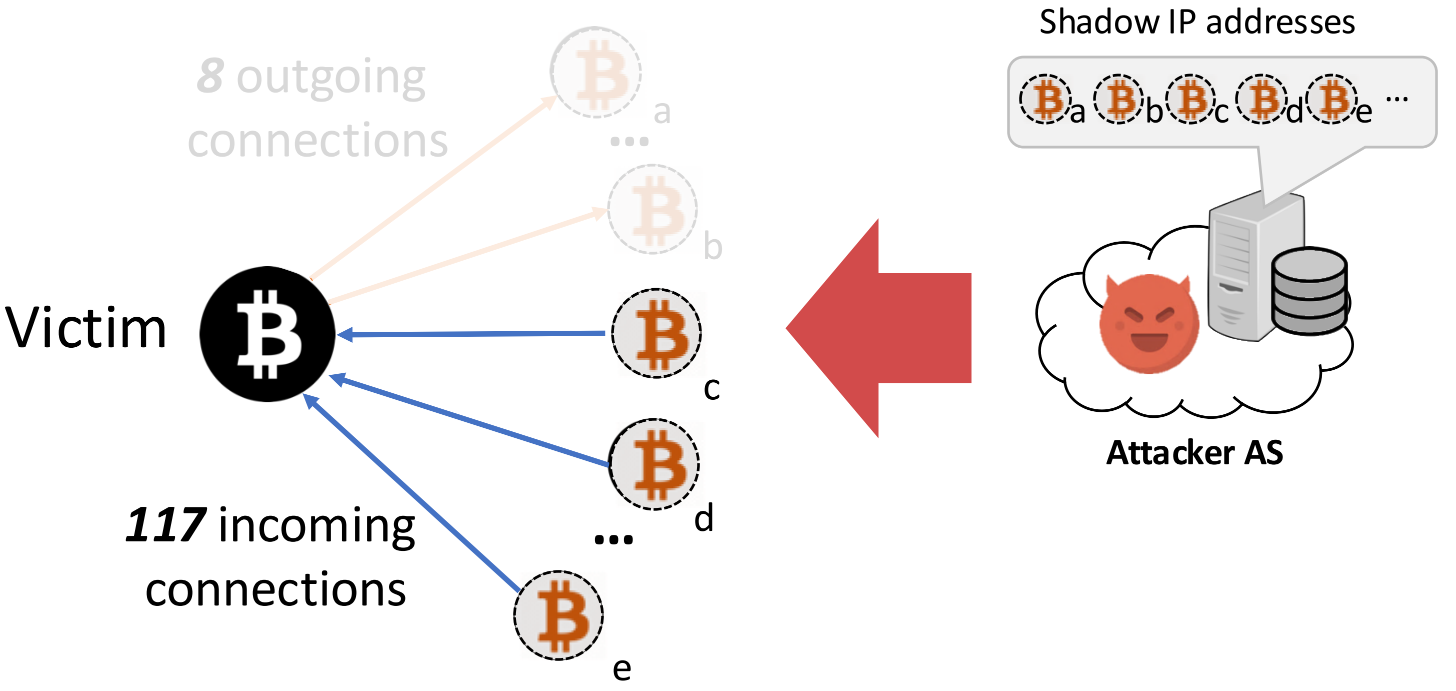

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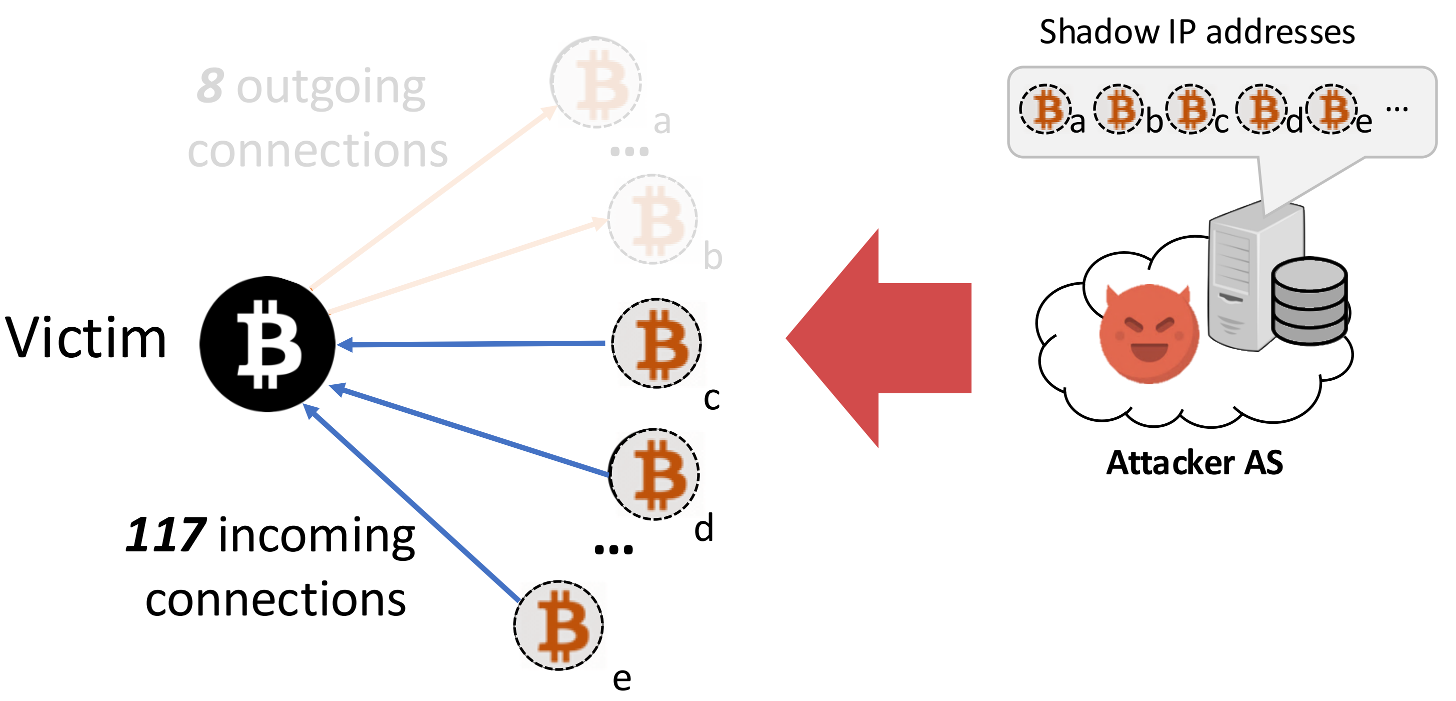

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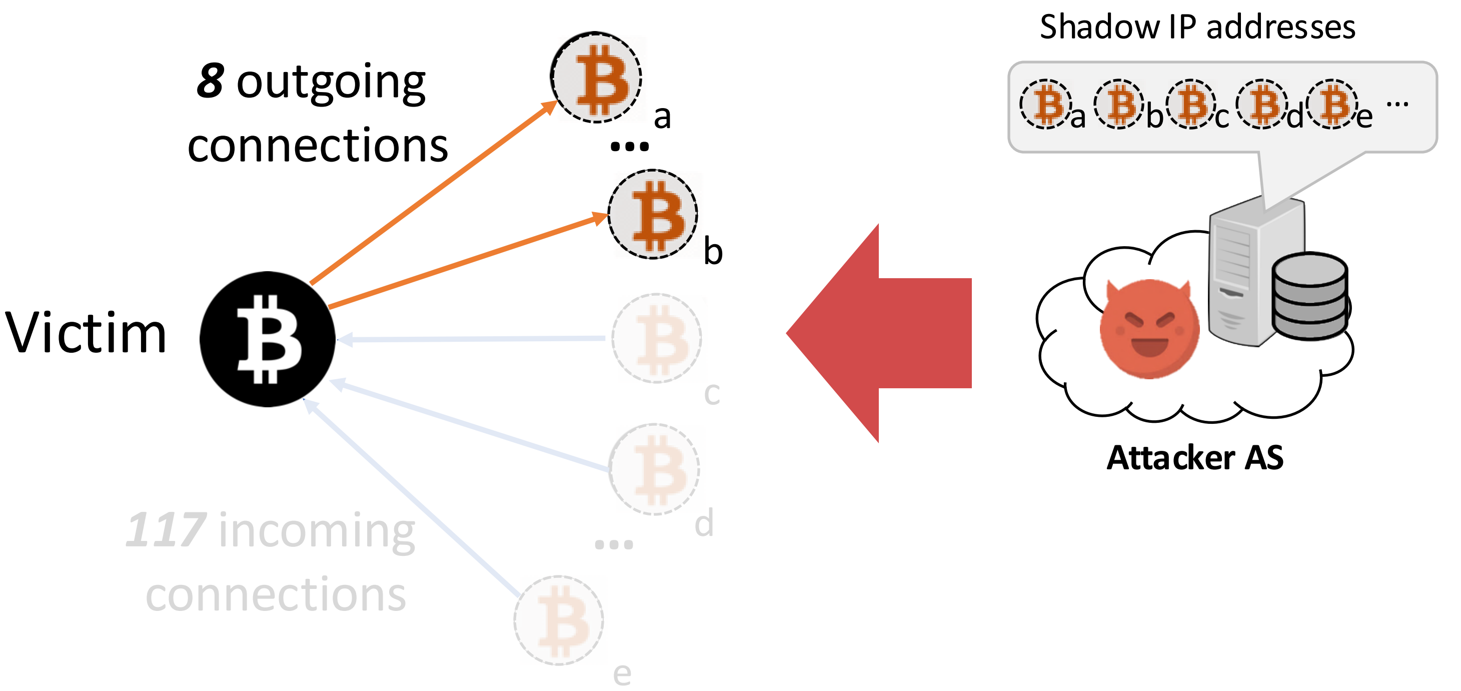

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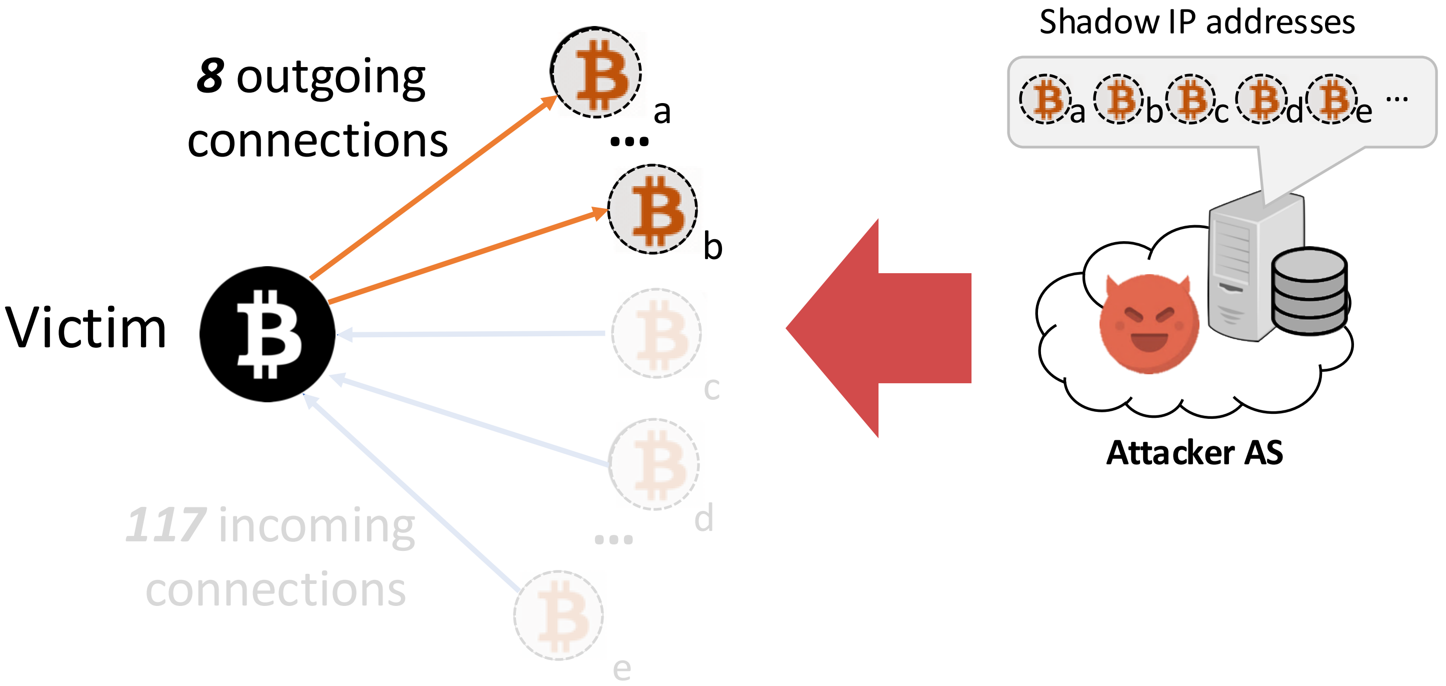

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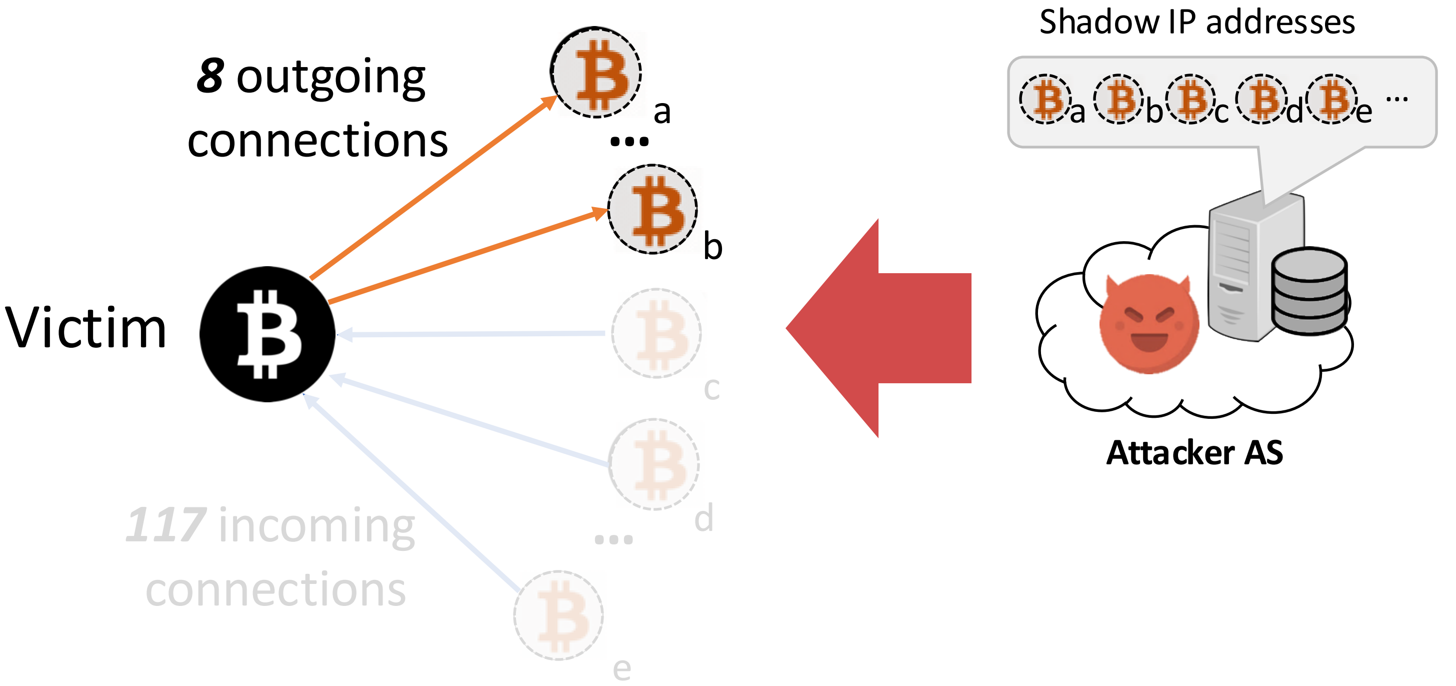

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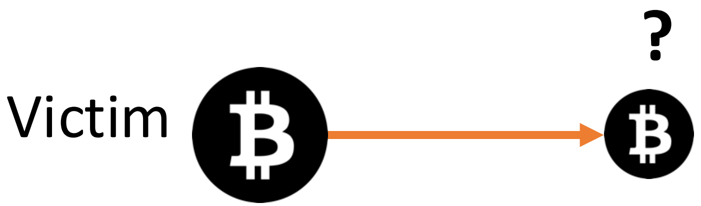

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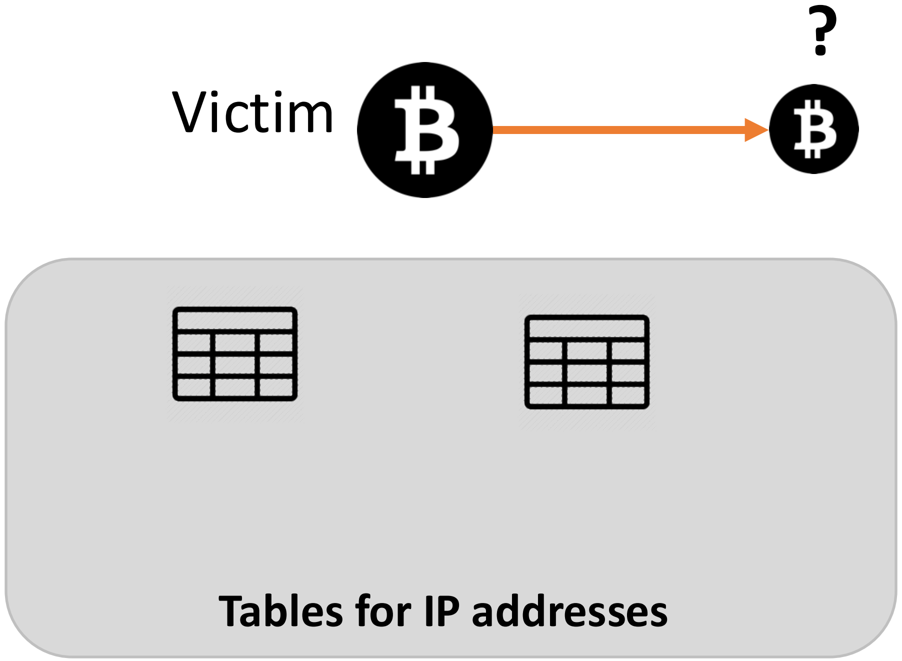

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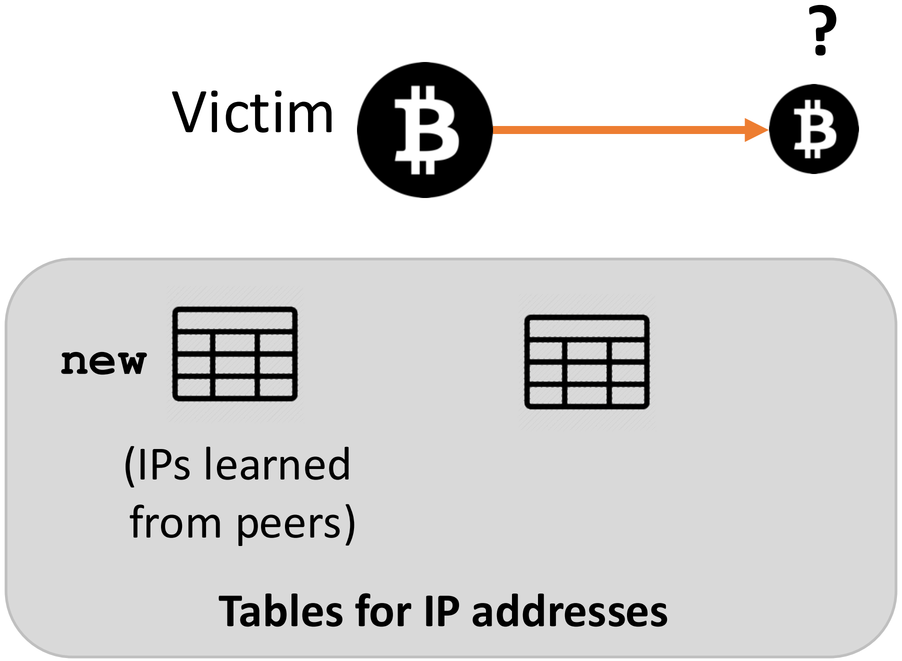

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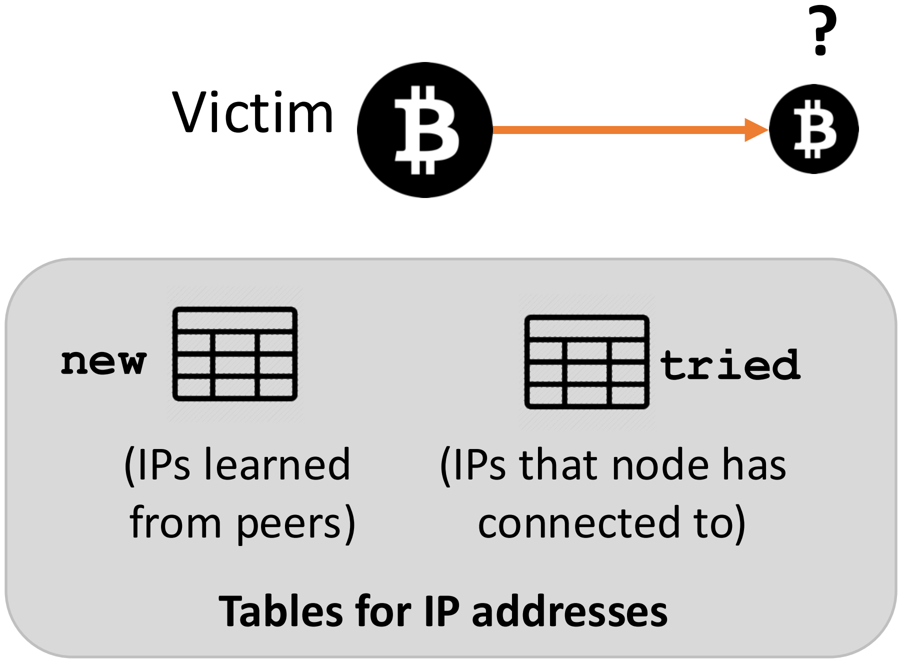

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tried

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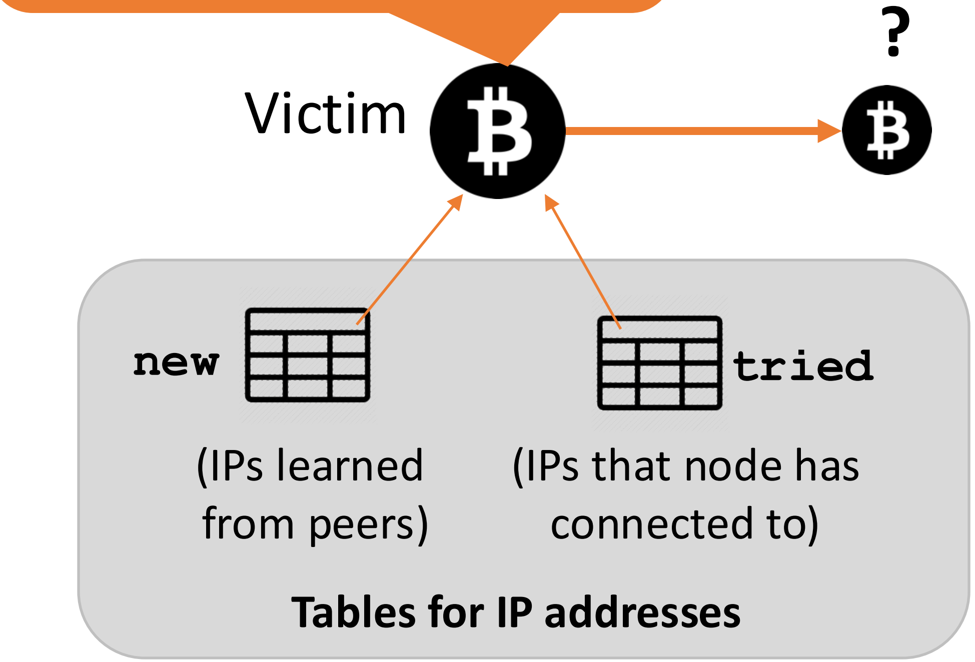

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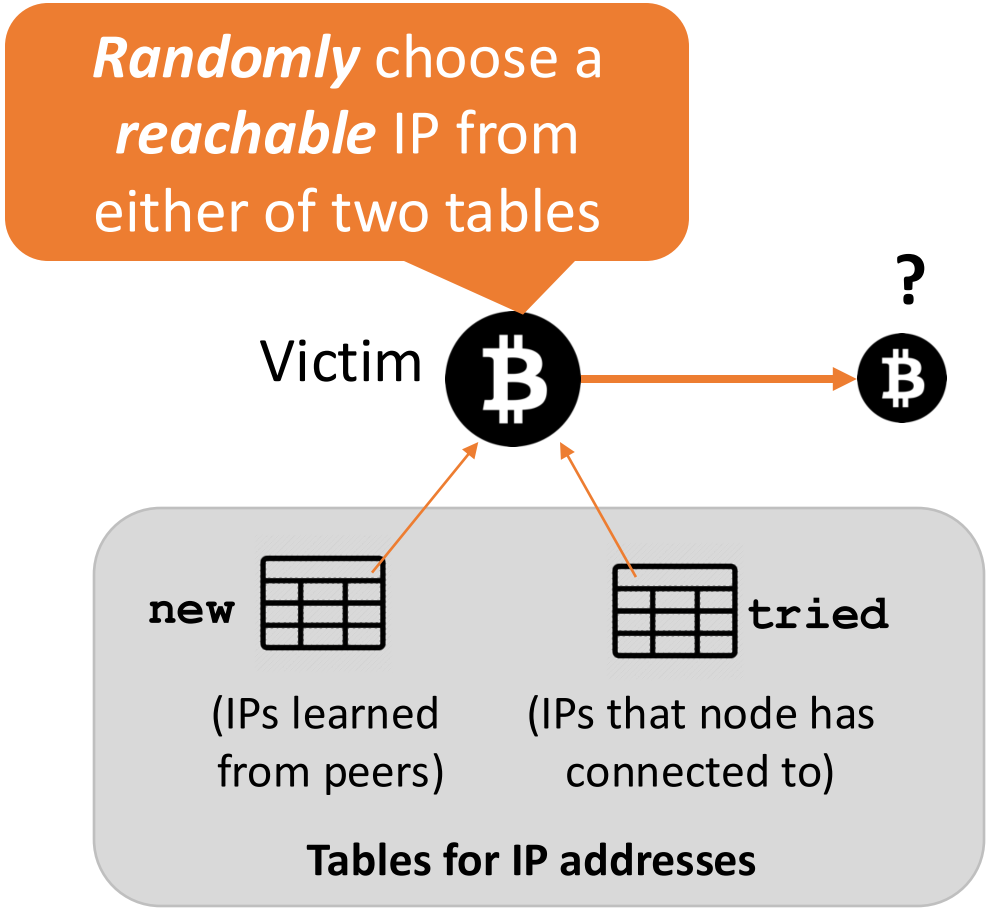
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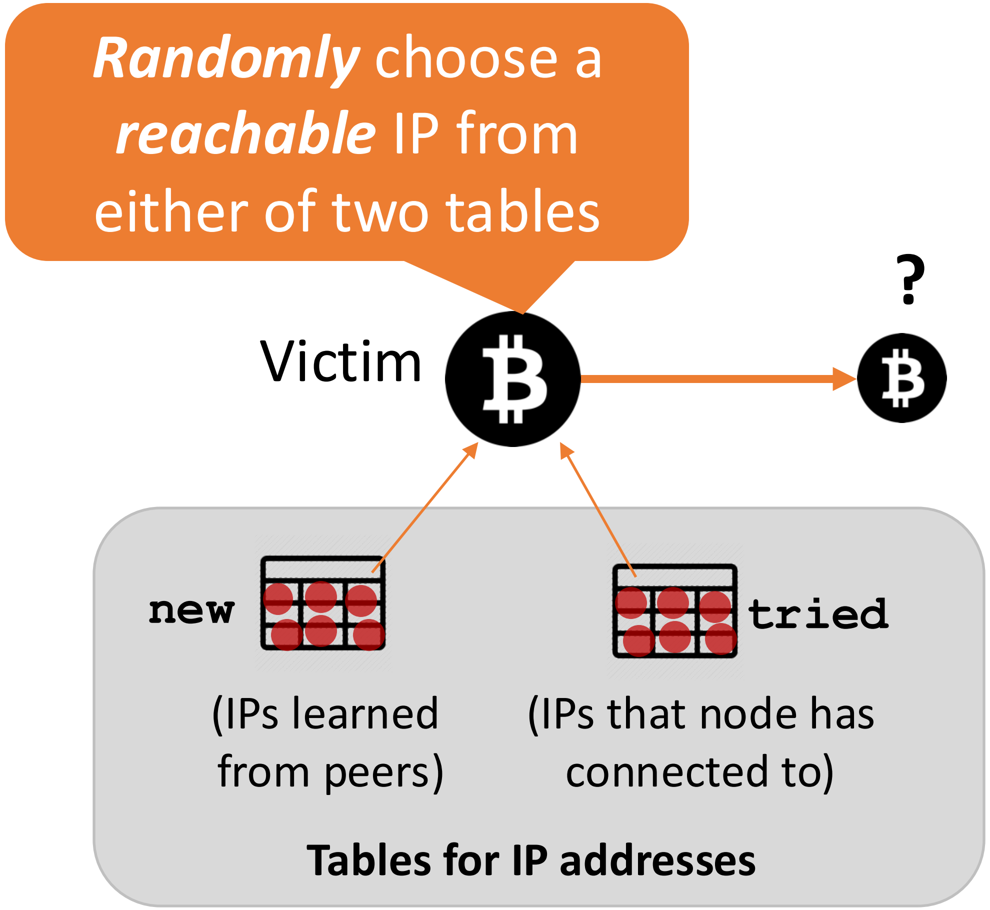

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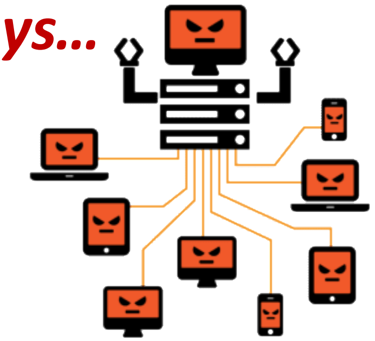

~ 3K bots

Eclipse attack

(Heilman et al., *USENIX Sec'15*)

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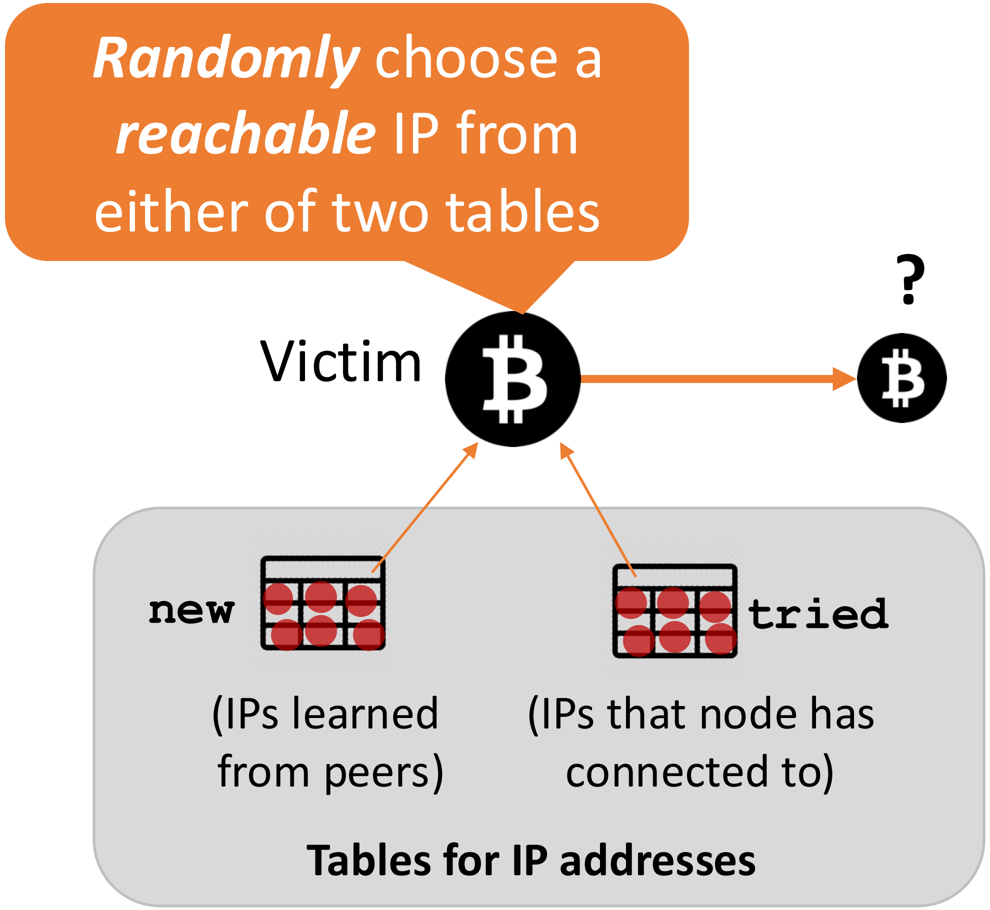

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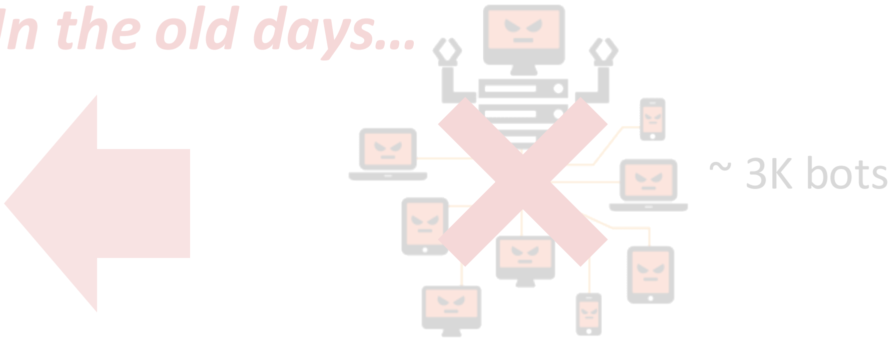

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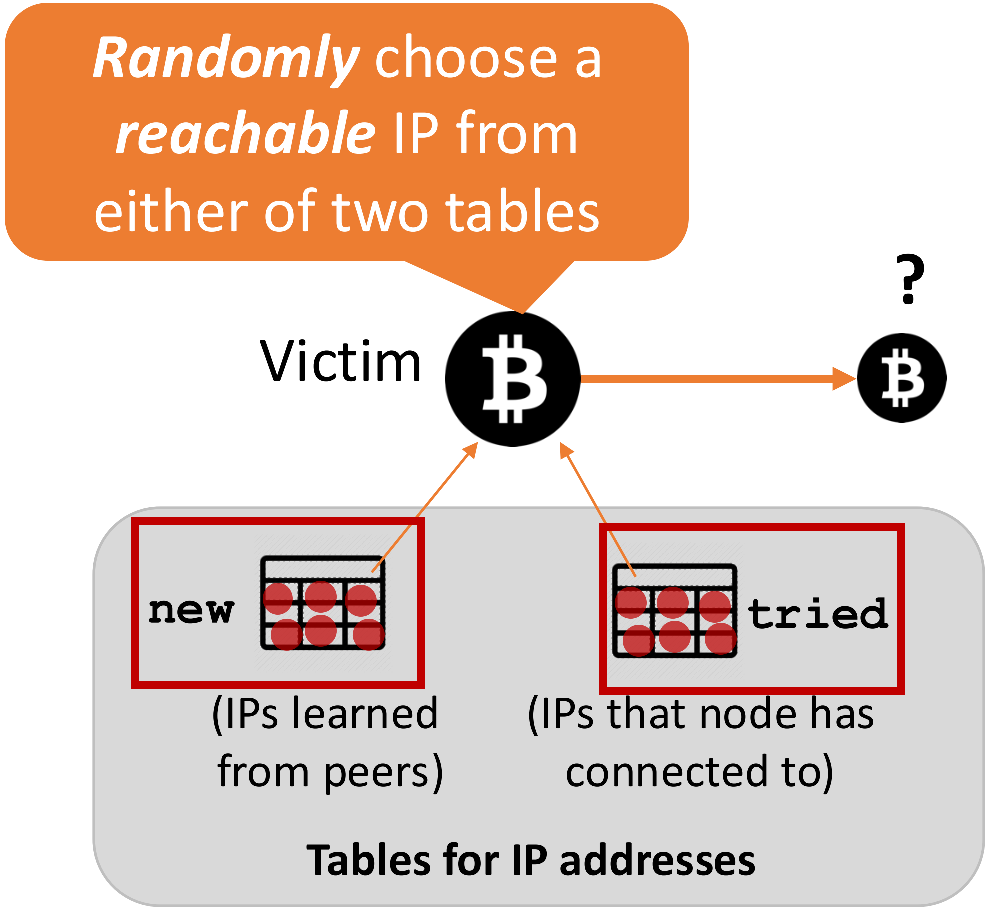

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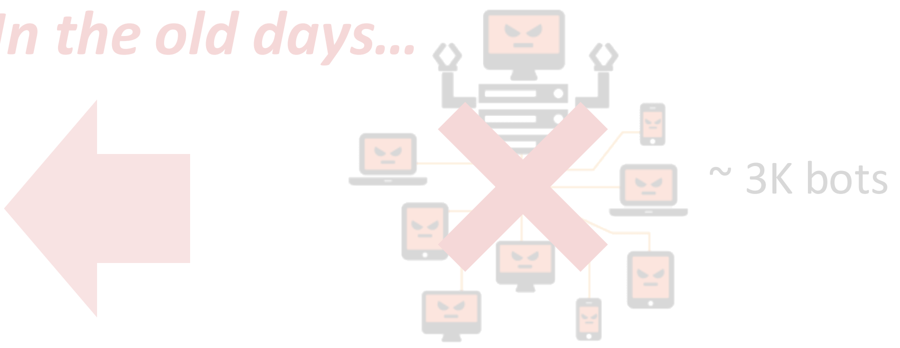

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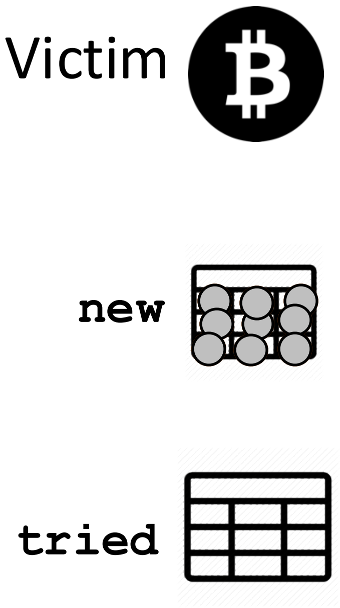

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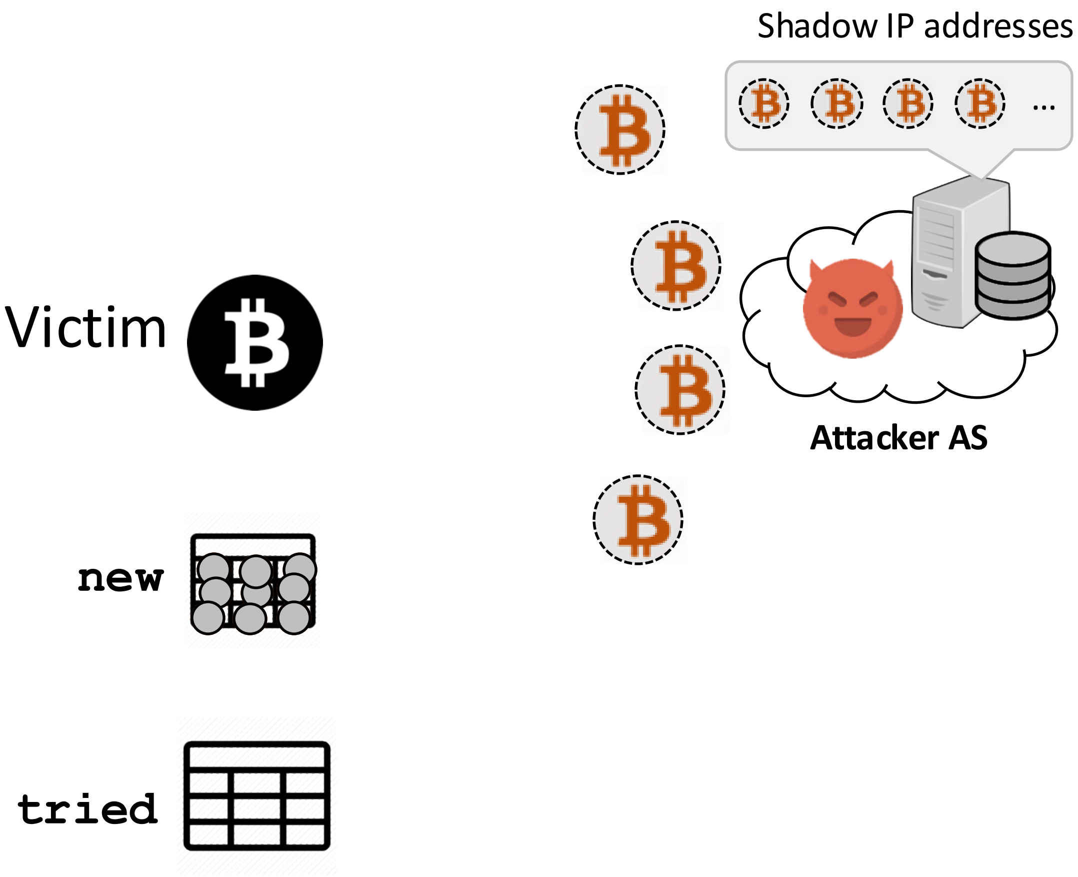

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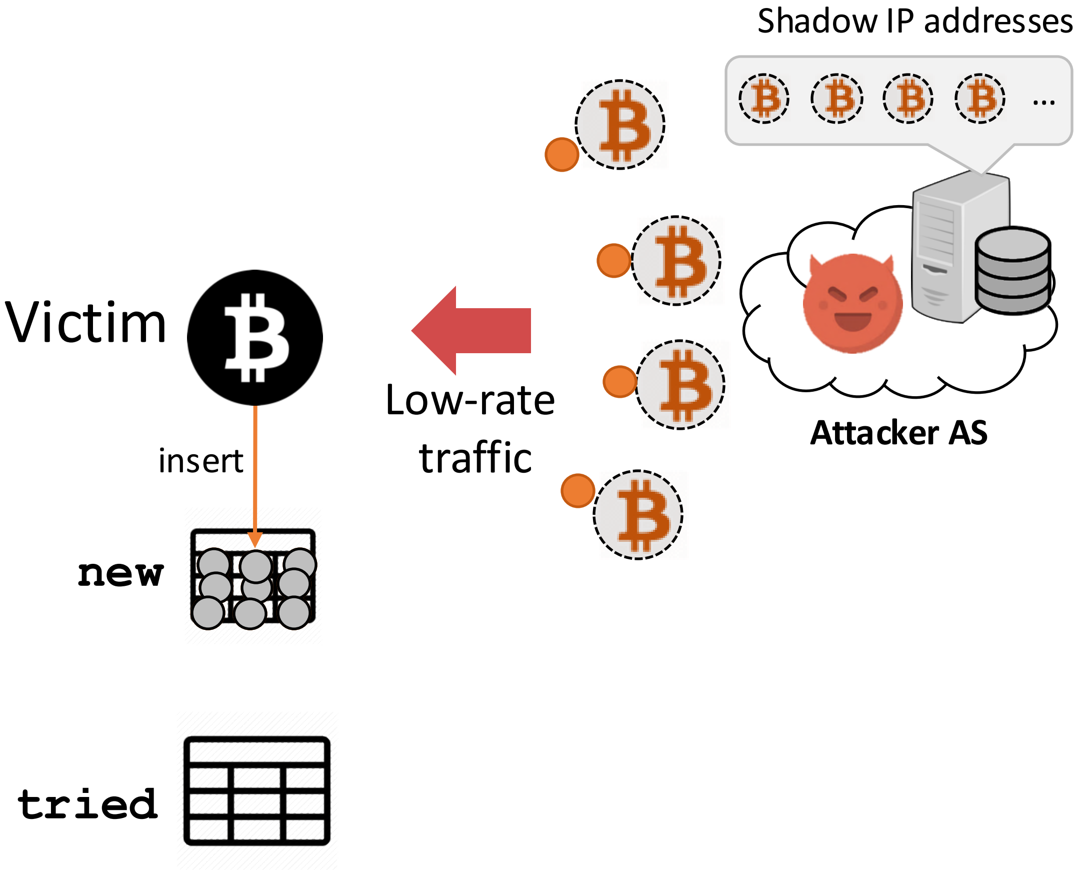

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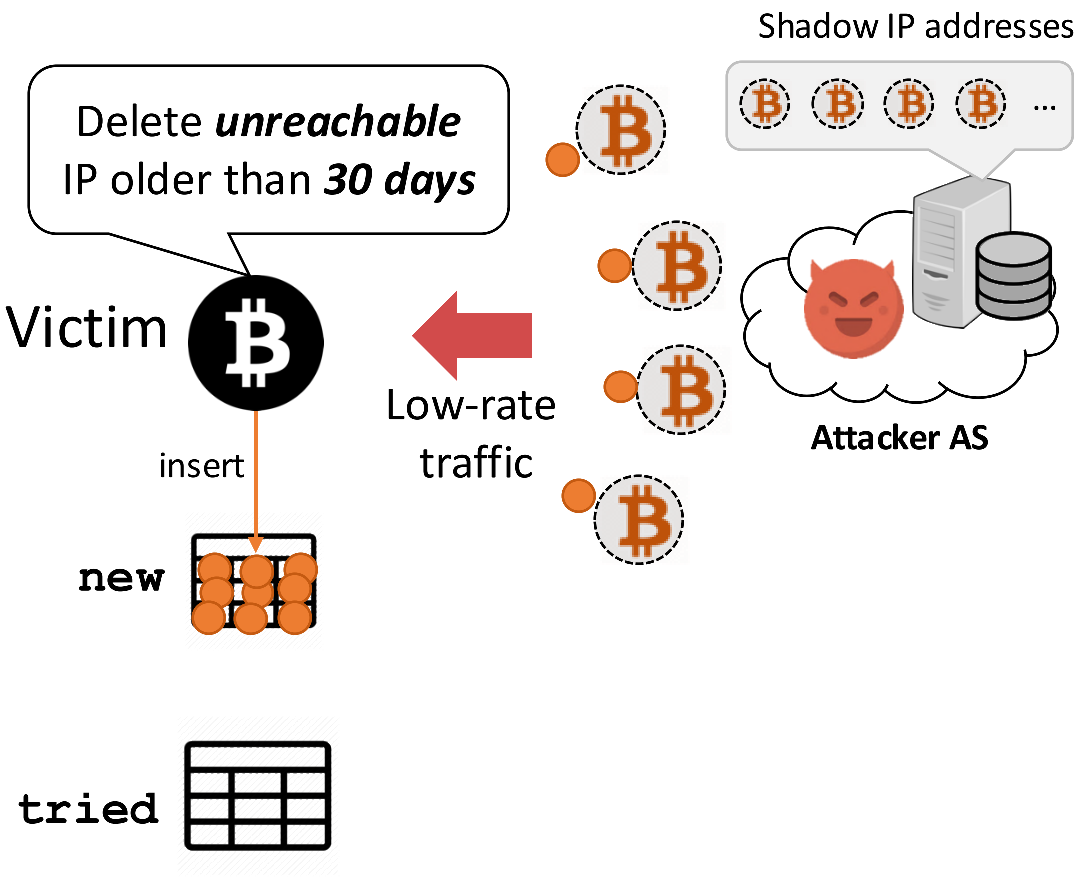

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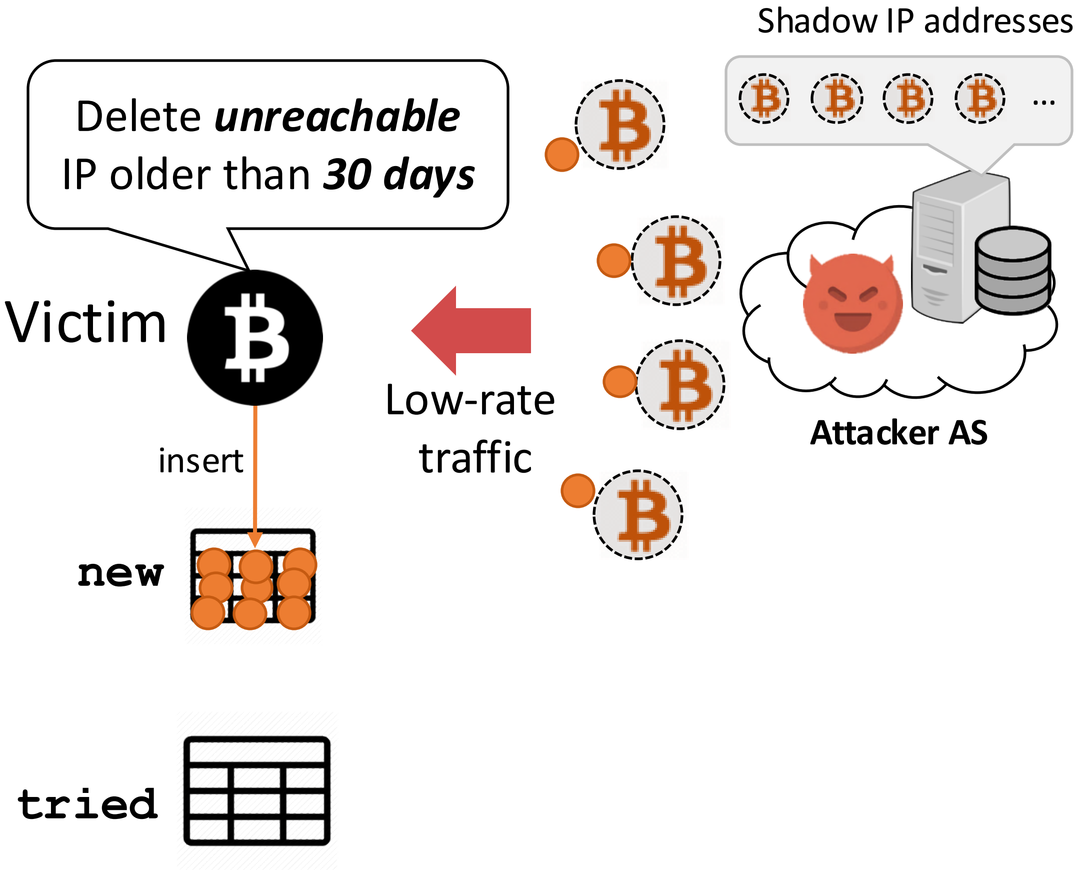

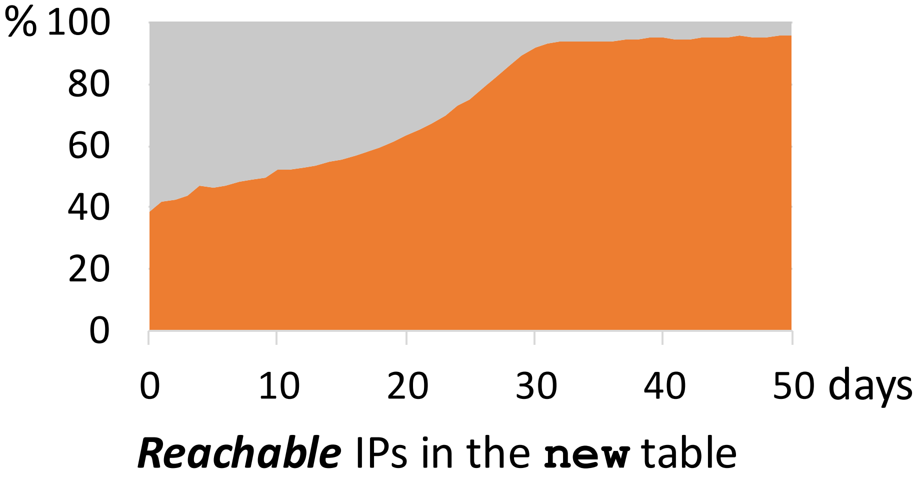

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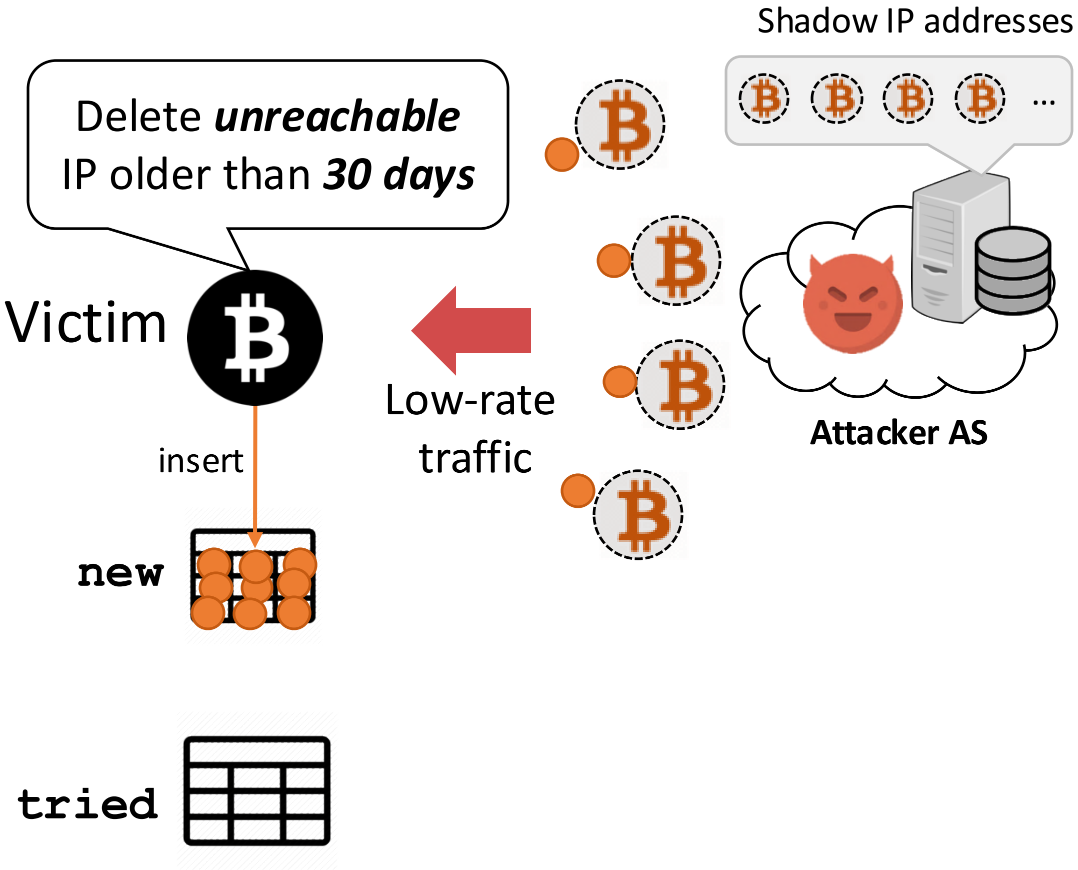

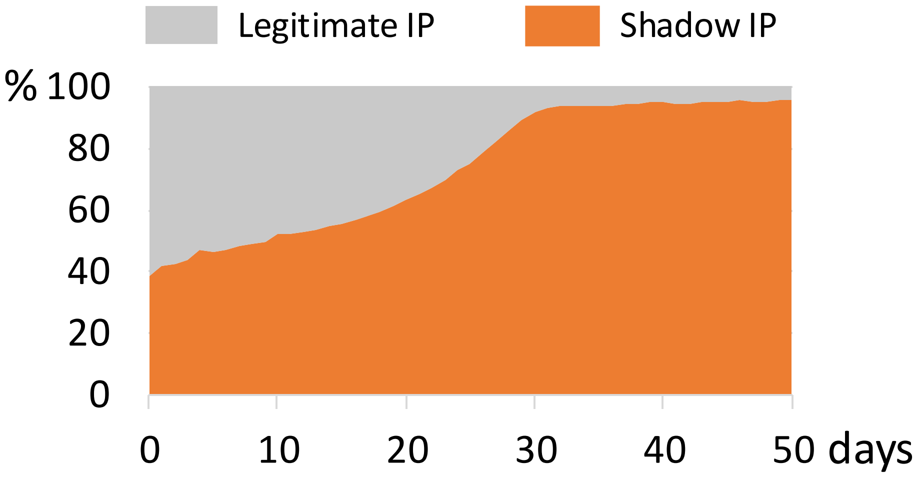

Reachable IPs in the **`new`** table

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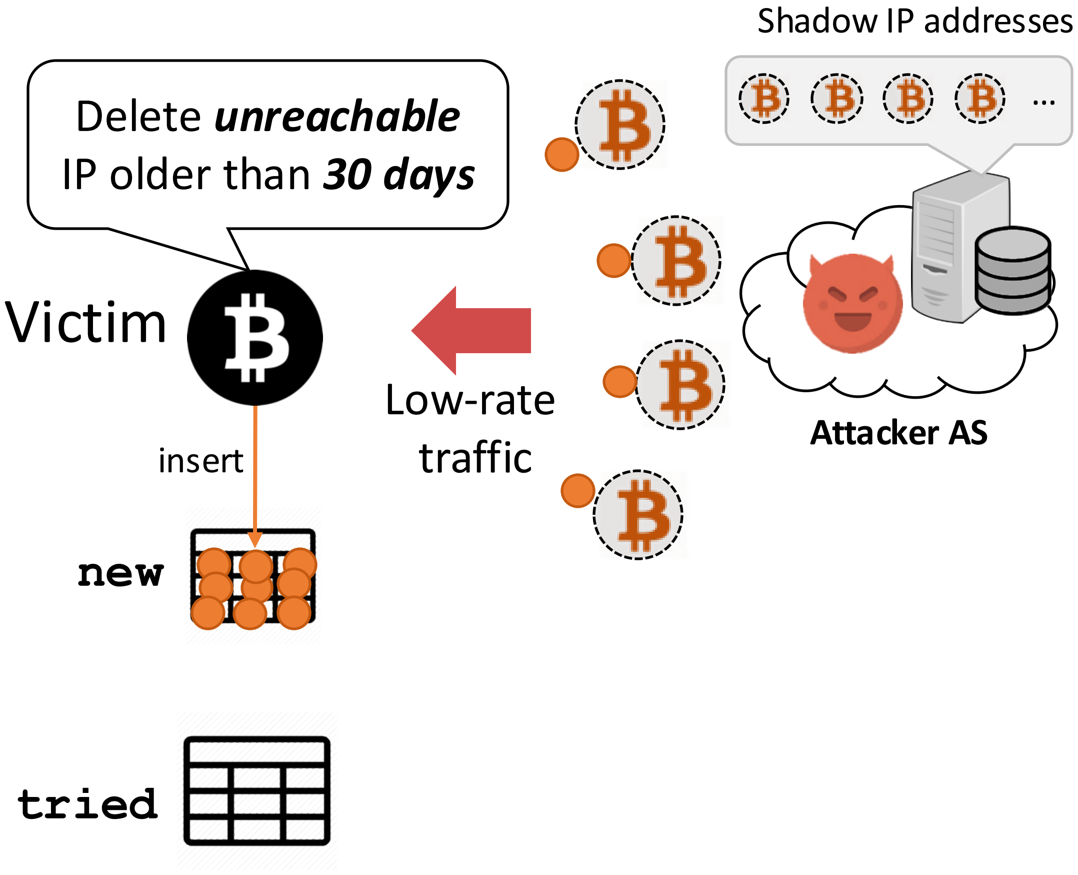
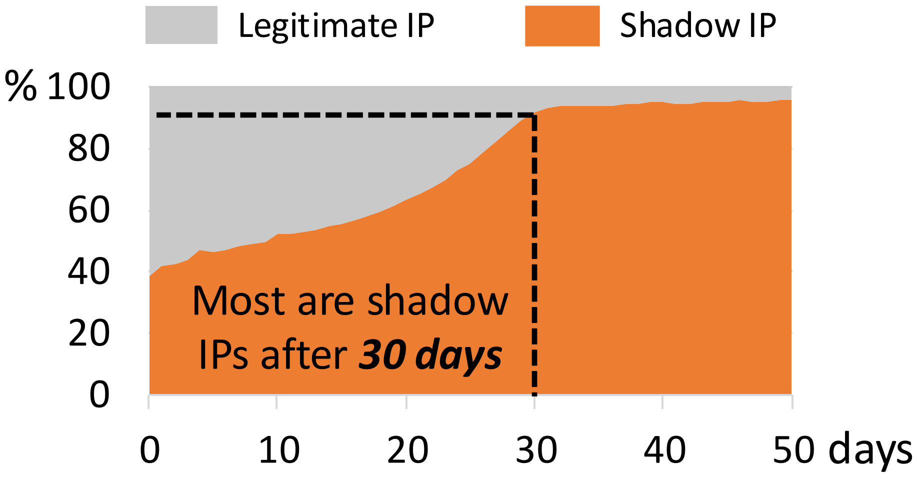

Delete ***unreachable*** IP older than ***30 days***



Most are shadow IPs after ***30 days***

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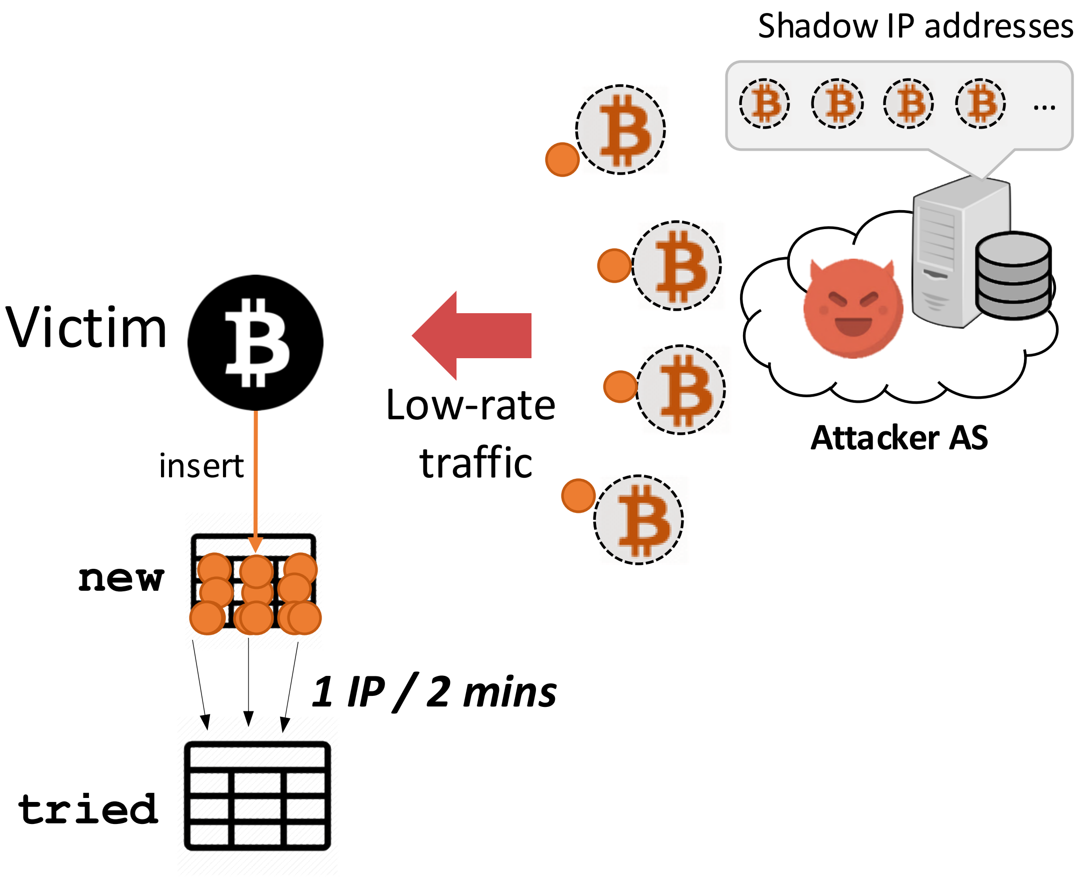

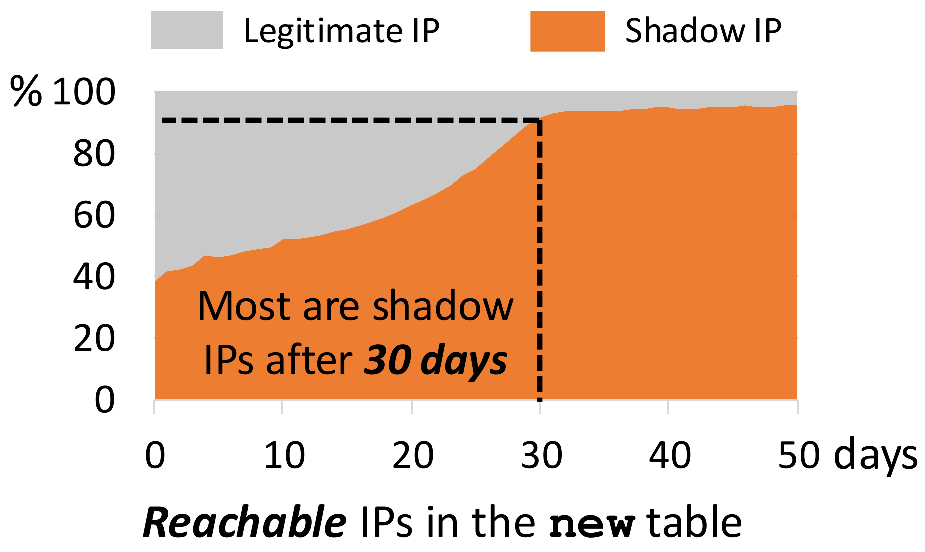

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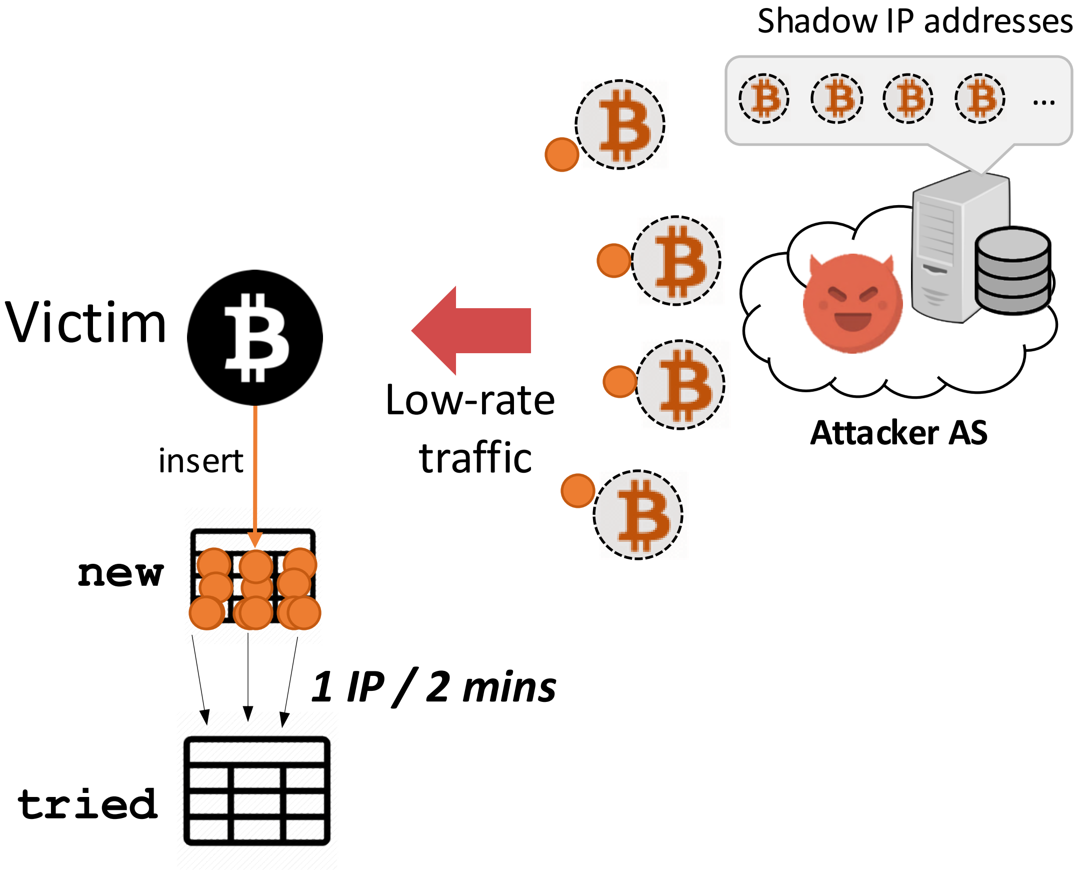

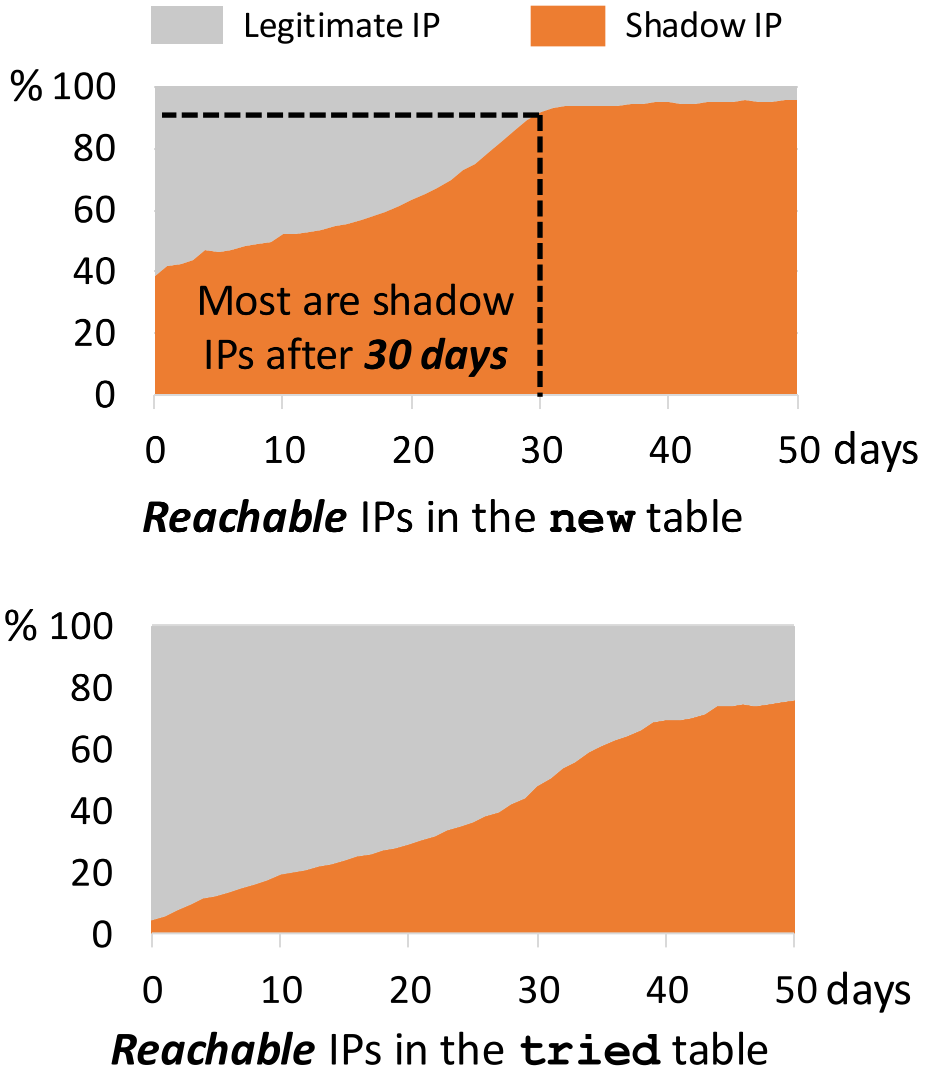

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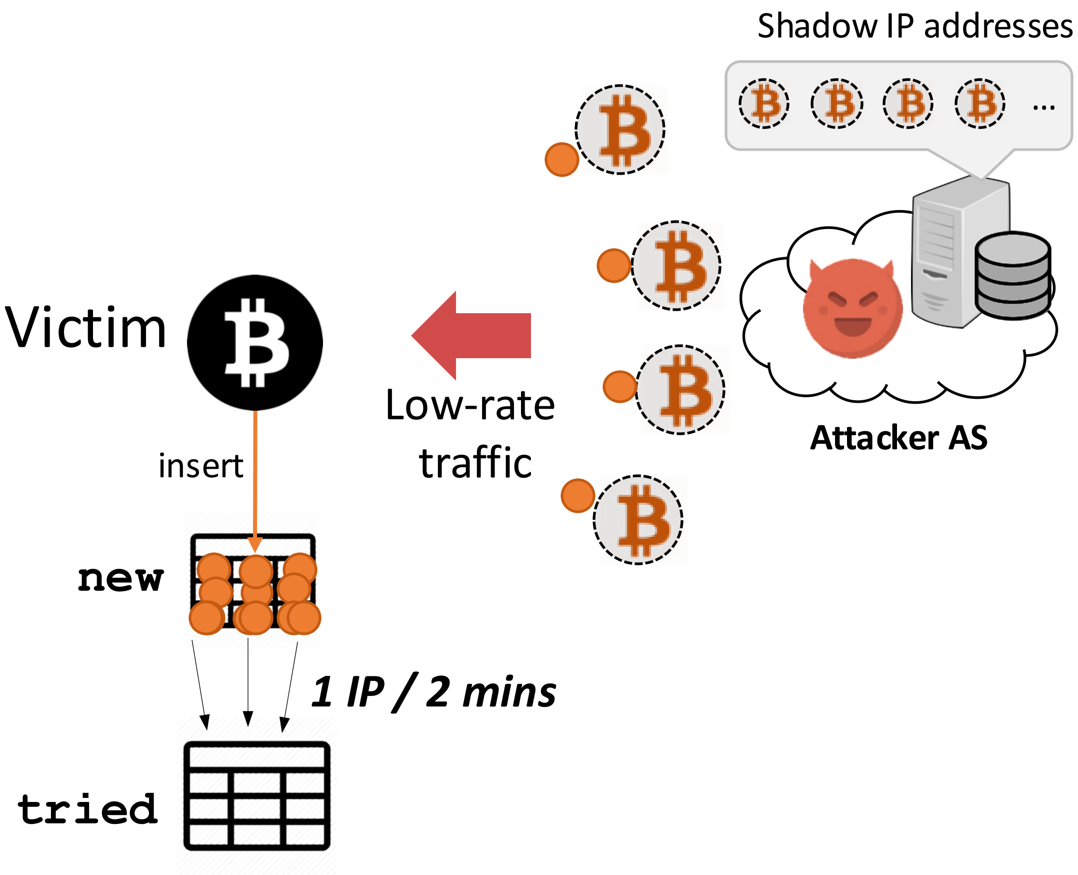

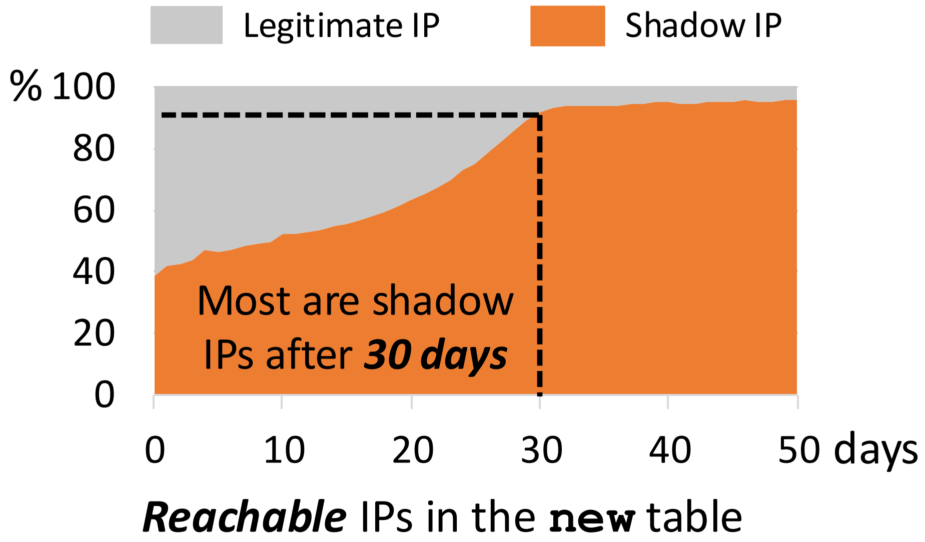

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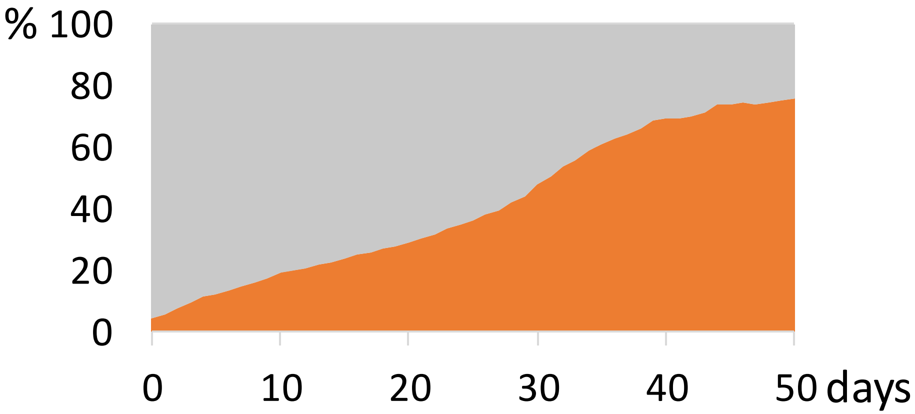

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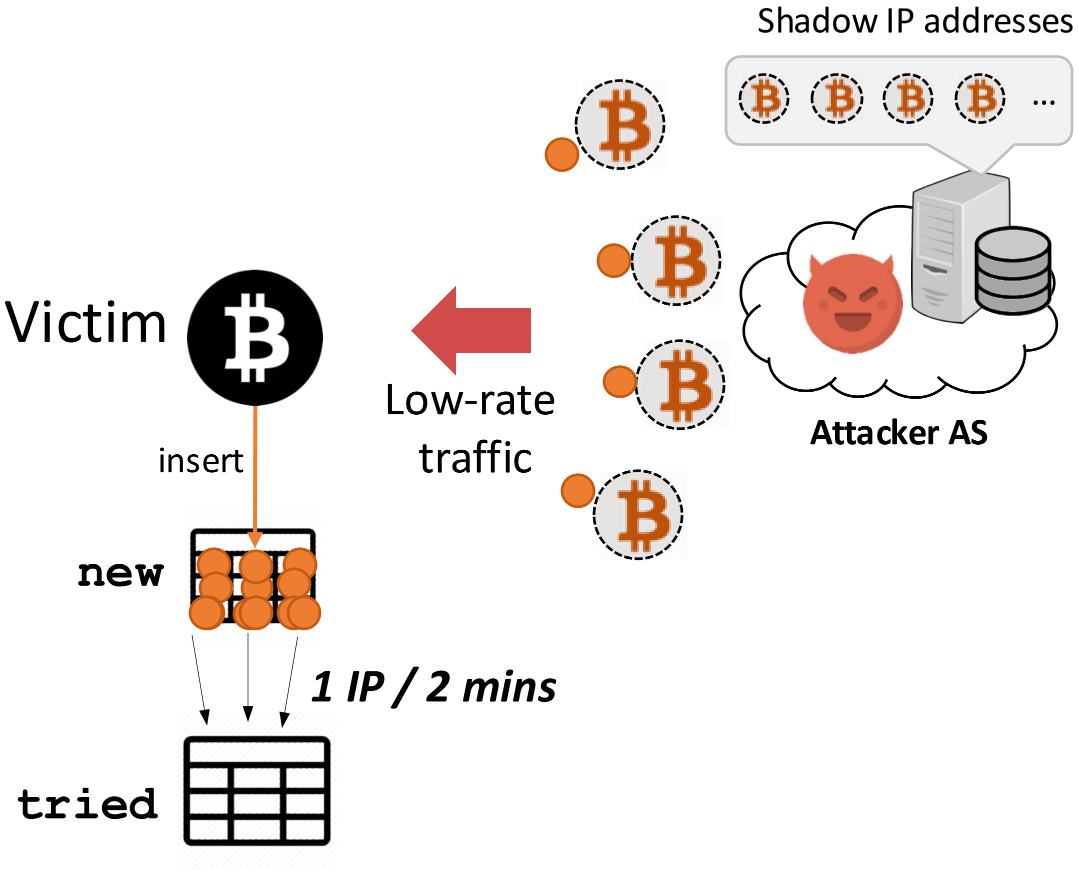

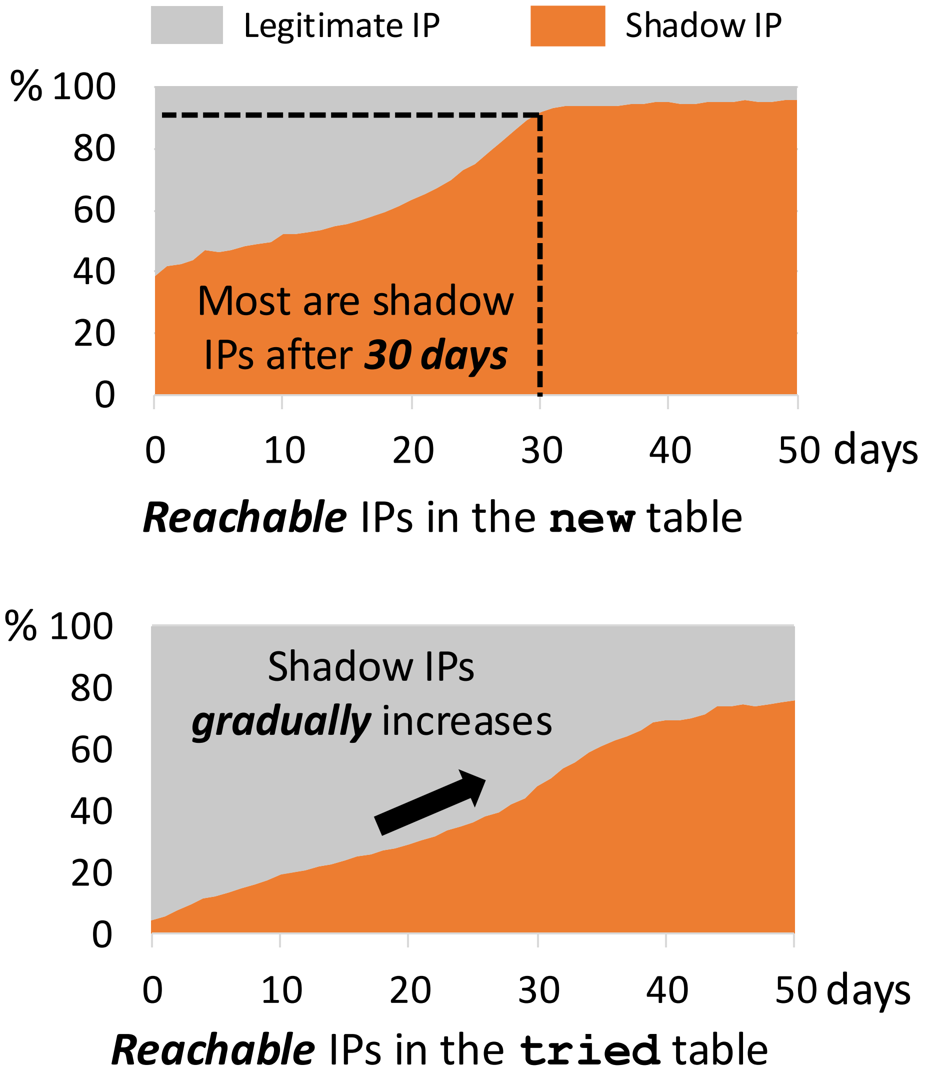

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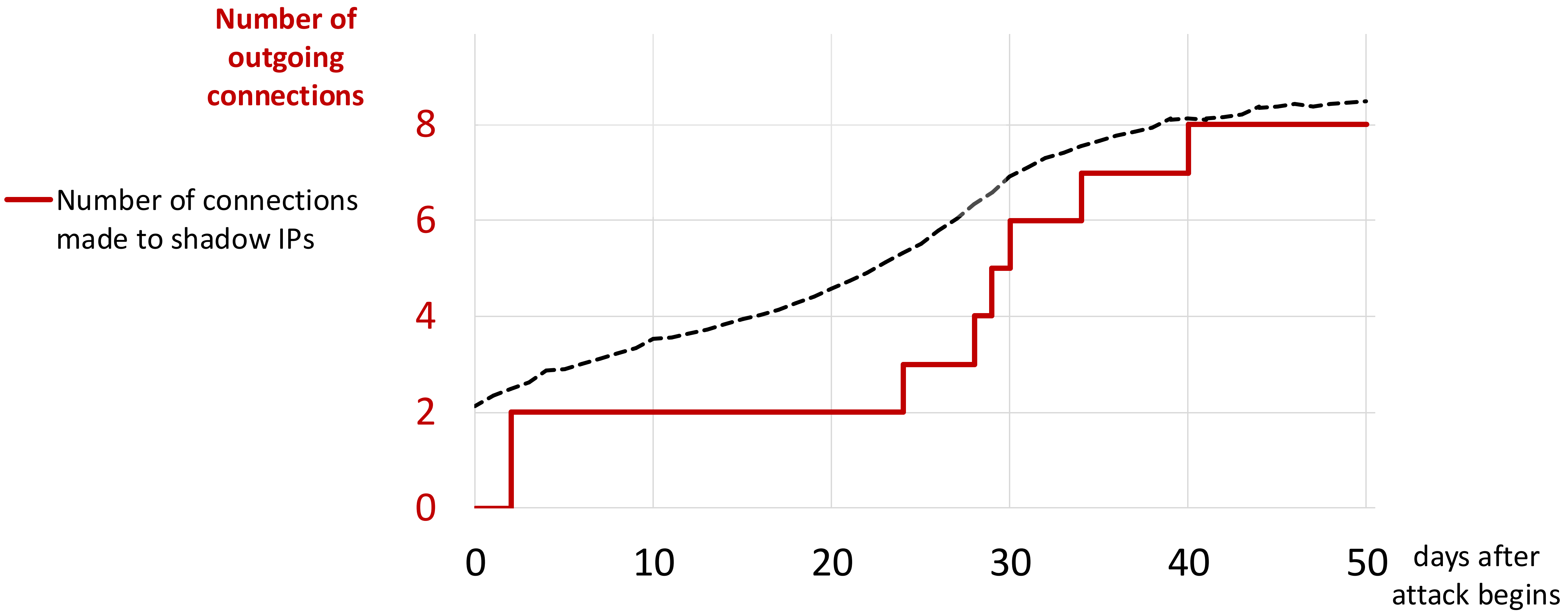

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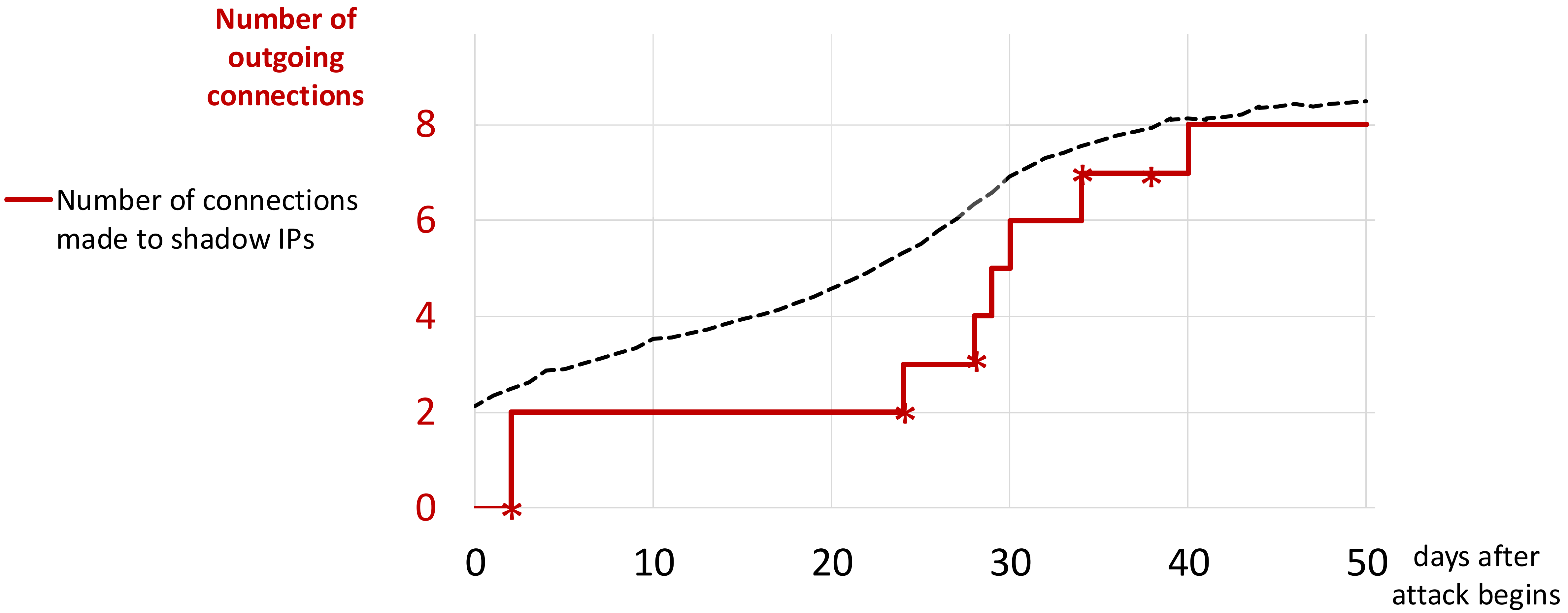

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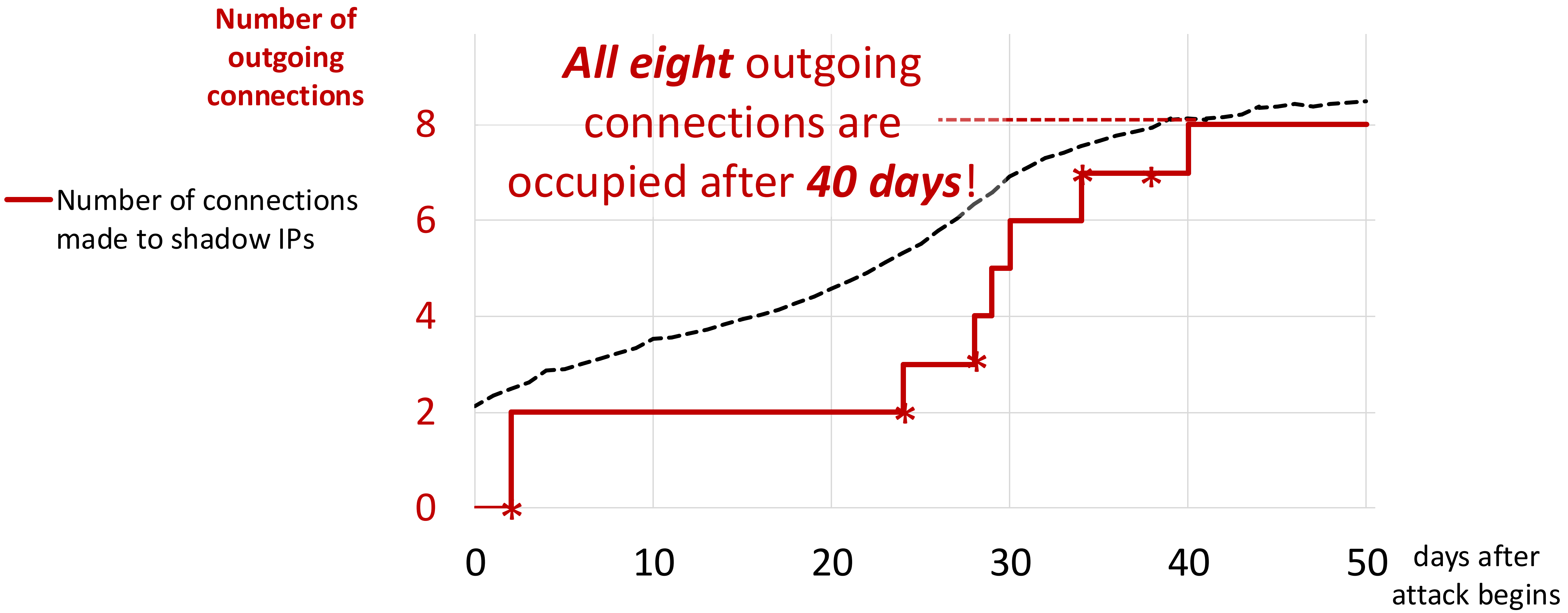

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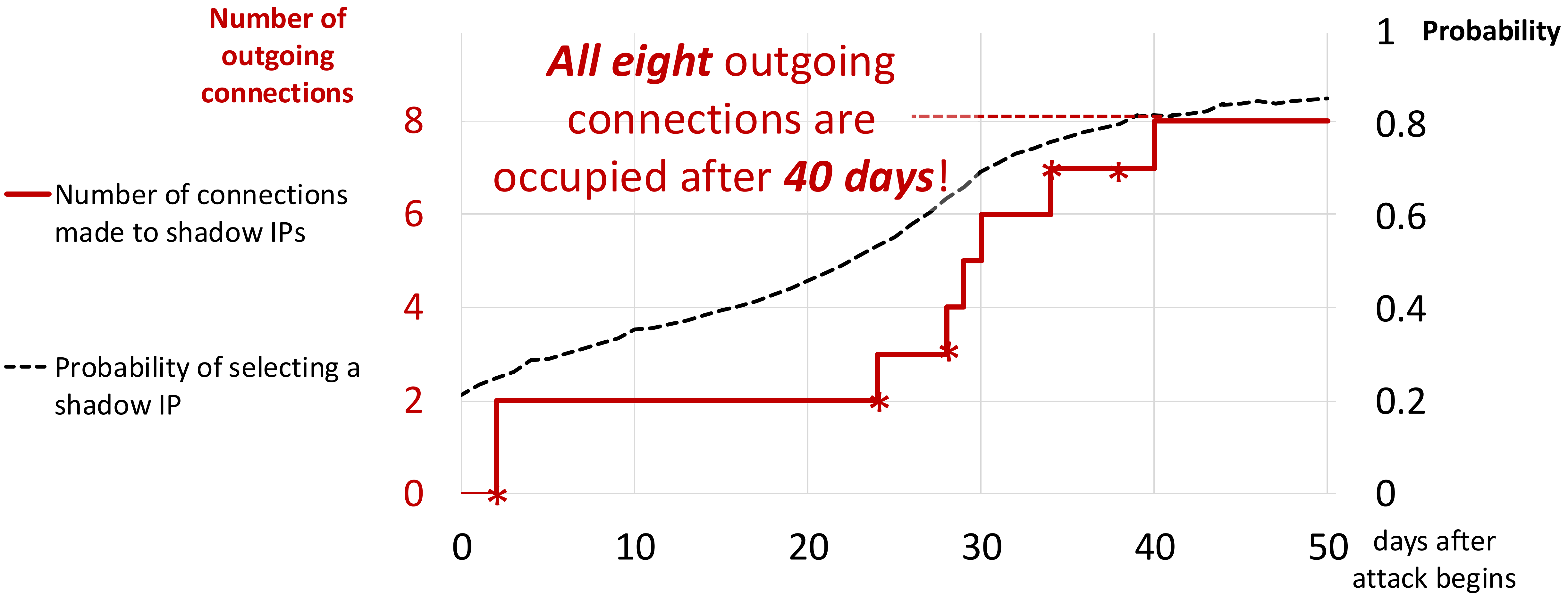

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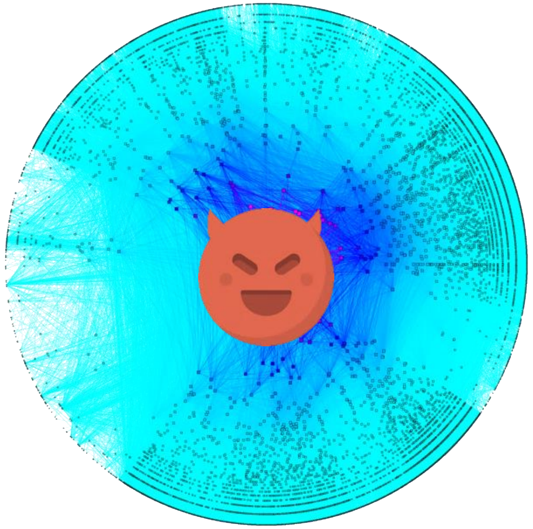

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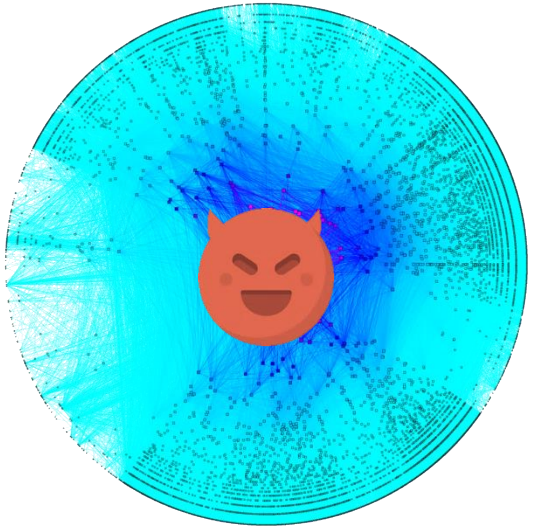

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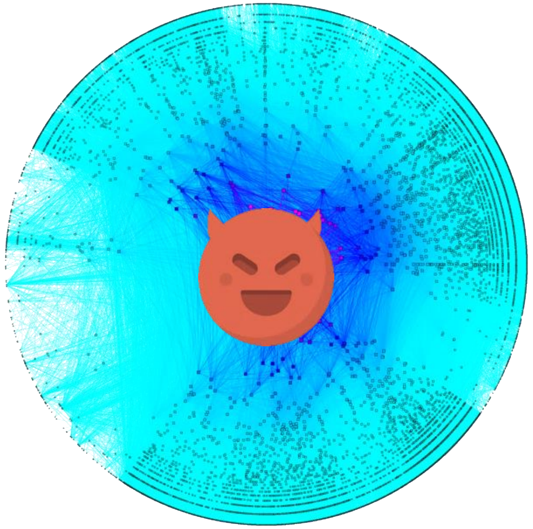

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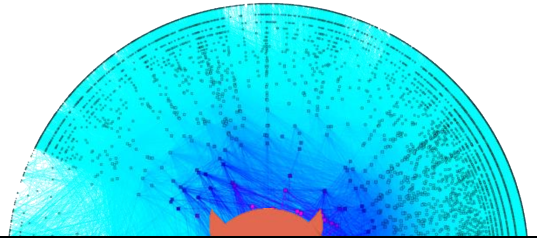

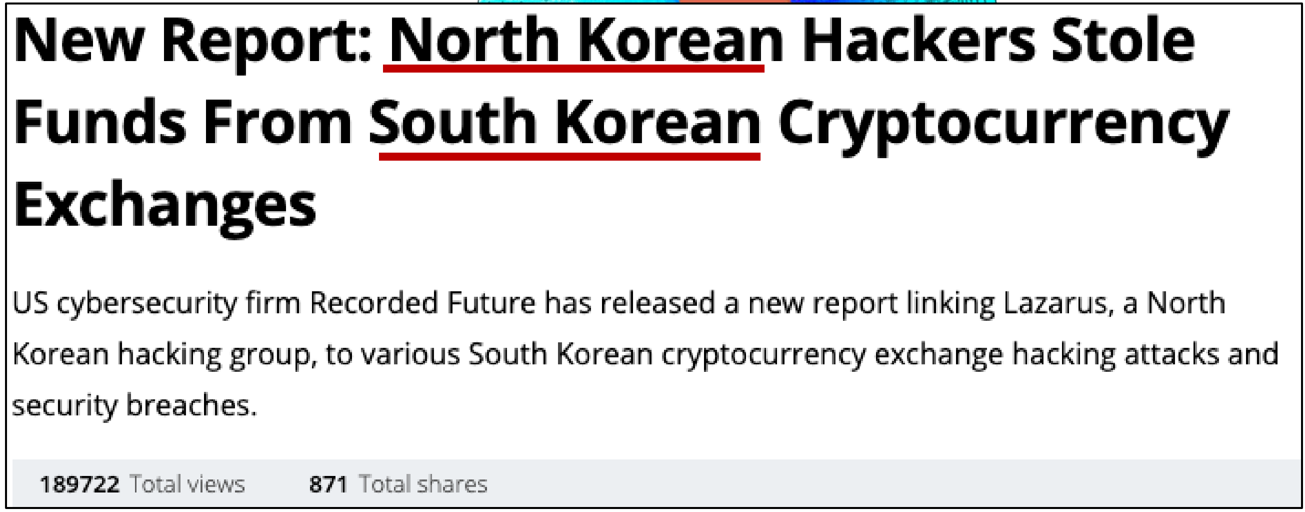

New Report: North Korean Hackers Stole Funds From South Korean Cryptocurrency Exchanges

US cybersecurity firm Recorded Future has released a new report linking Lazarus, a North Korean hacking group, to various South Korean cryptocurrency exchange hacking attacks and security breaches.

189722 Total views **871** Total shares

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bitcoin

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Conclusions

EREBUS

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- Updates on countermeasures: https://erebus-attack.comp.nus.edu.sg/

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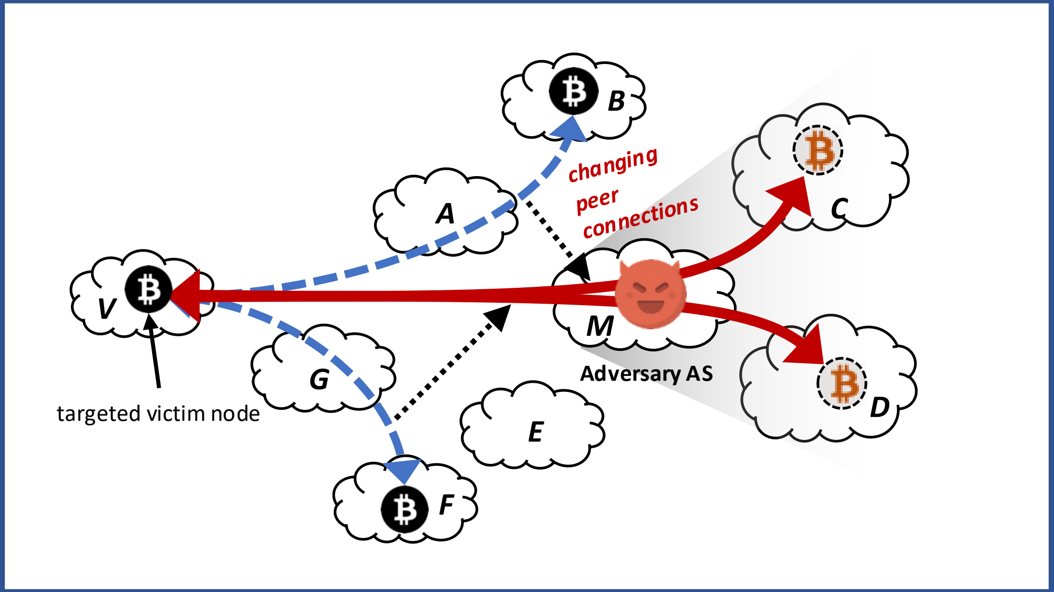

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