Tracking Ransomware End-to-end

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Ransomware causes financial damages

ars TECHNICA SIGN IN

RISK ASSESSMENT —

Two more healthcare networks caught up in outbreak of hospital ransomware

New server-targeting malware hitting healthcare targets with unpatched websites.

SEAN GALLAGHER - 3/29/2016, 4:11 PM

Ransomware causes financial damages

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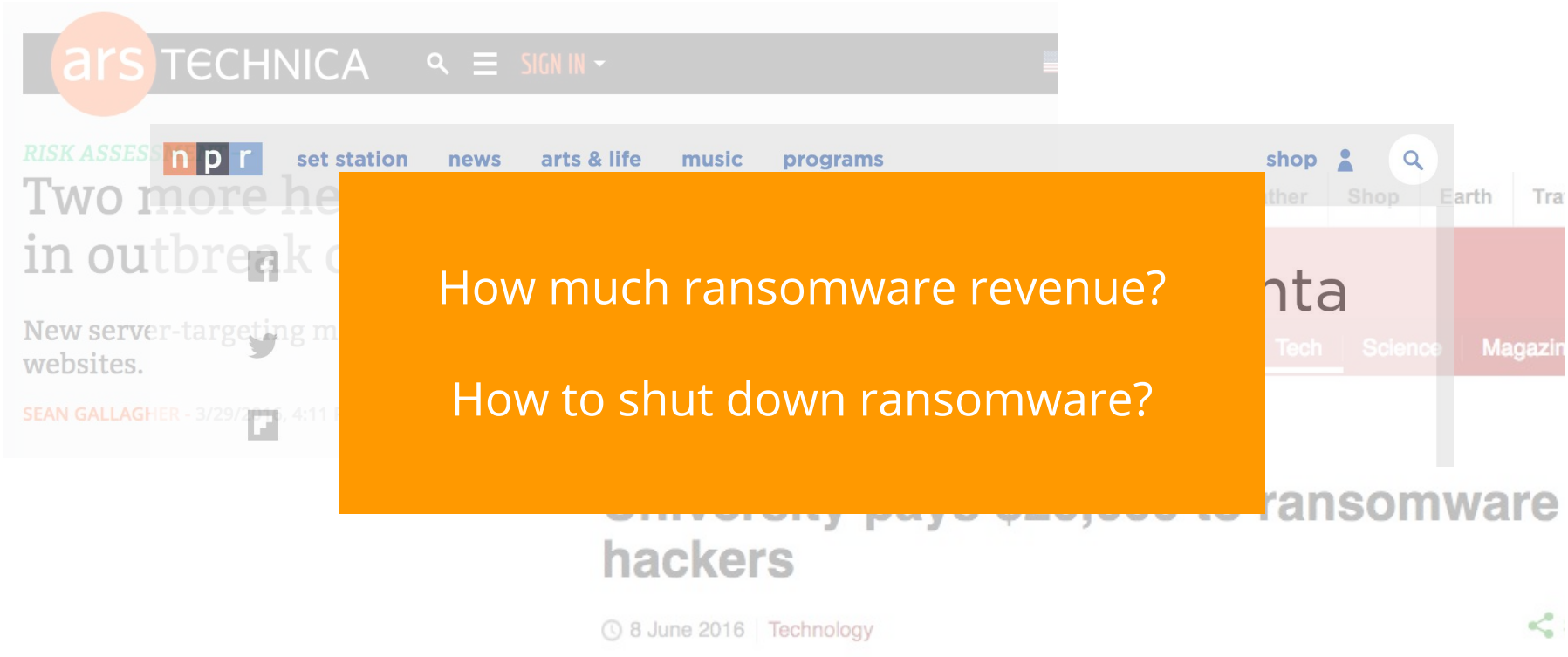

How much ransomware revenue?

How to shut down ransomware?

How typical ransomware works

1. Distribution

   Spam, compromised websites, etc

How typical ransomware works

1. Distribution
2. Infection

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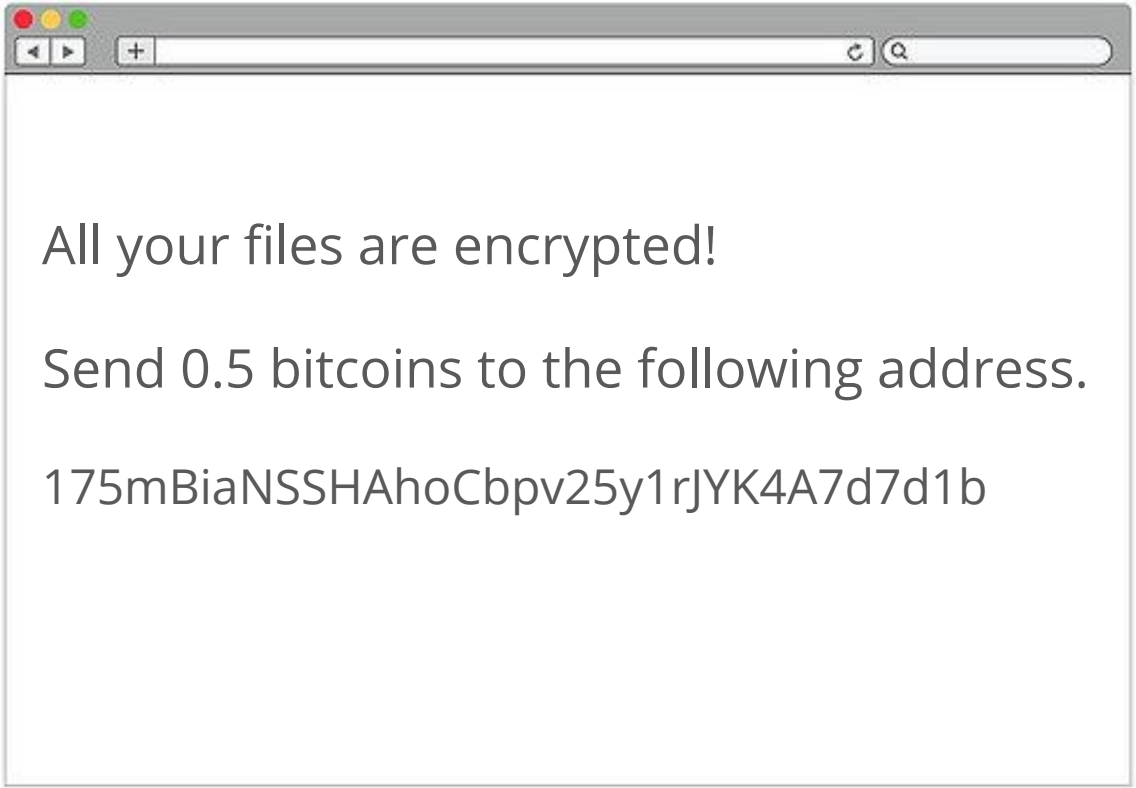
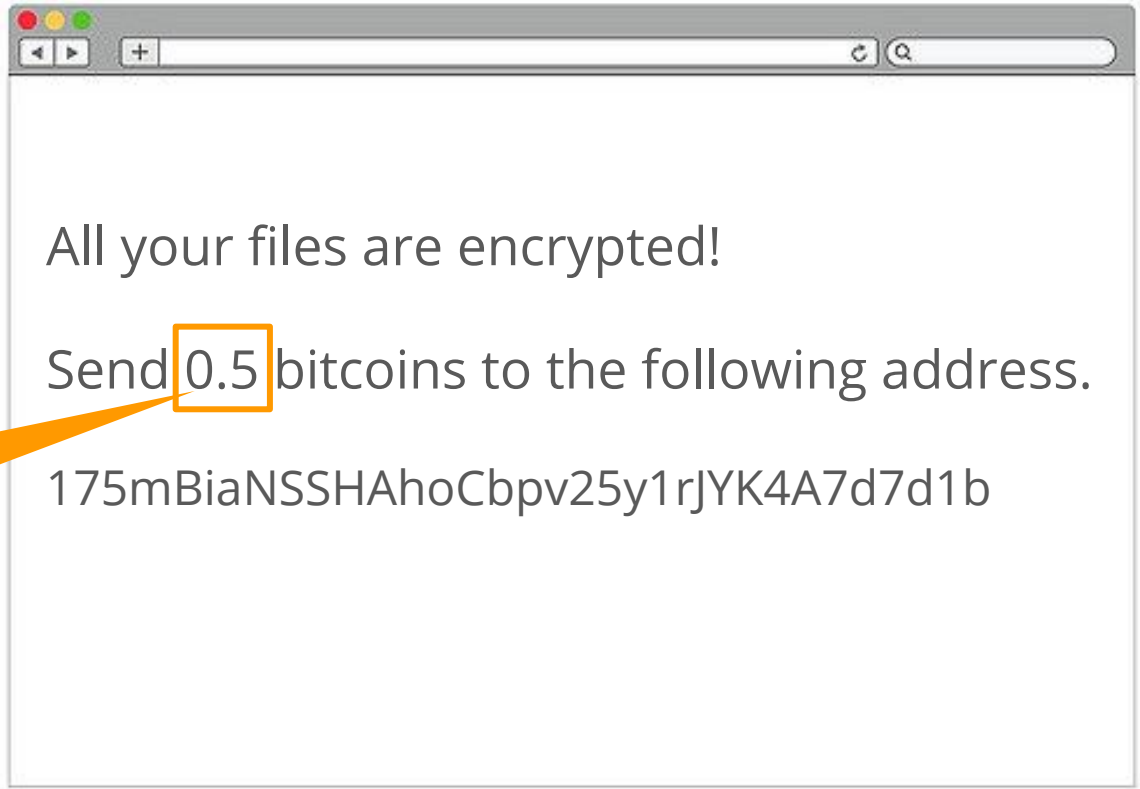


How typical ransomware works

1. Distribution
2. Infection

Cerber: median ~$1,000

Locky: median ~$1,800



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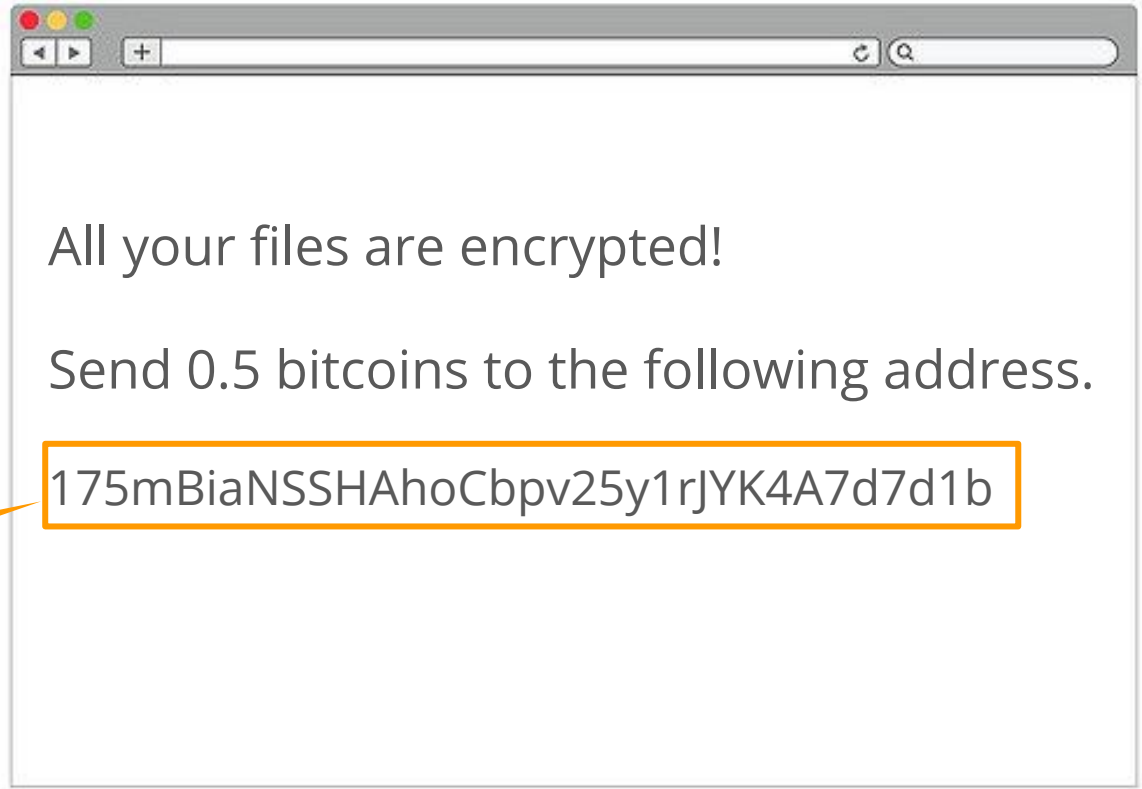

How typical ransomware works

Victim’s money

1. Distribution
2. Infection
3. Victim pays bitcoins

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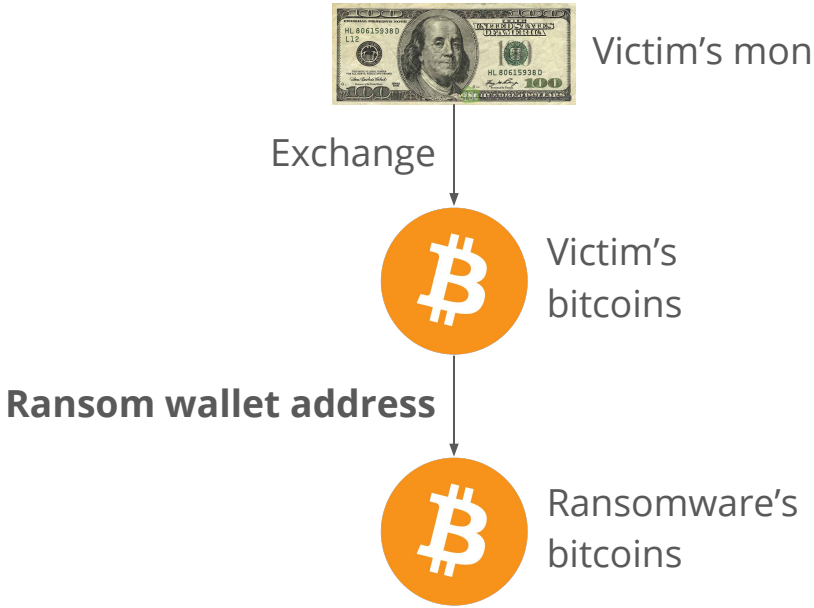
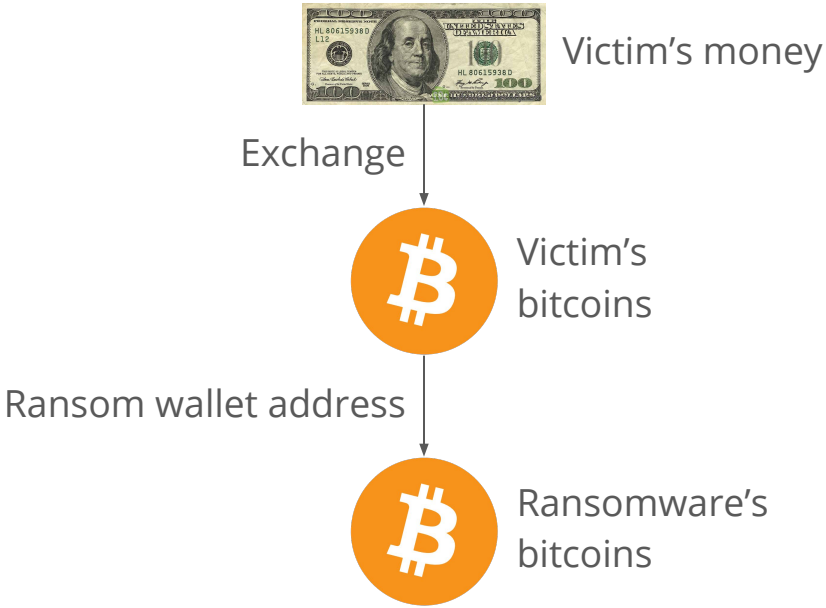


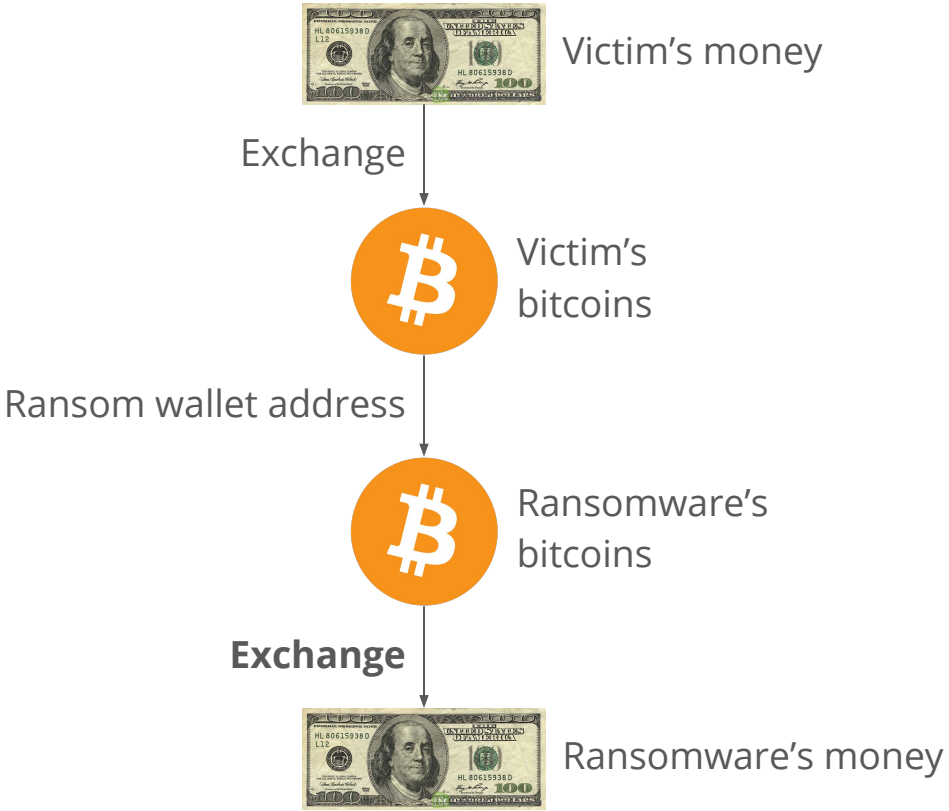
How typical ransomware works

1. Distribution
2. Infection
3. Victim pays bitcoins
4. Decryption



How typical ransomware works

1. Distribution
2. Infection
3. Victim pays bitcoins
4. Decryption
5. Criminal liquidates bitcoins



Research questions

How to estimate the total ransom paid (or revenue)?

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How to identify chokepoints?

Overview of results

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1 Blockchain Analysis

Methodology: Follow the money

1. Identify known victims

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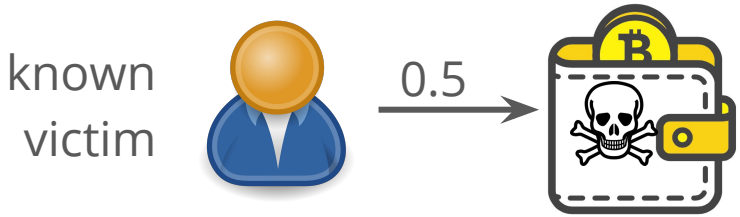

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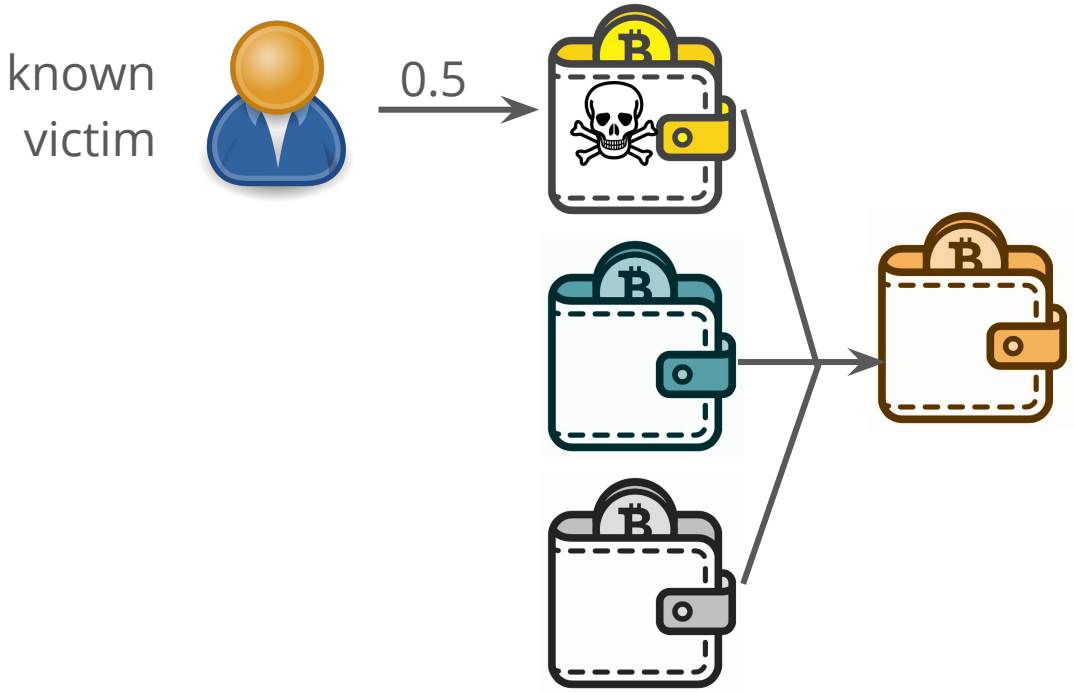

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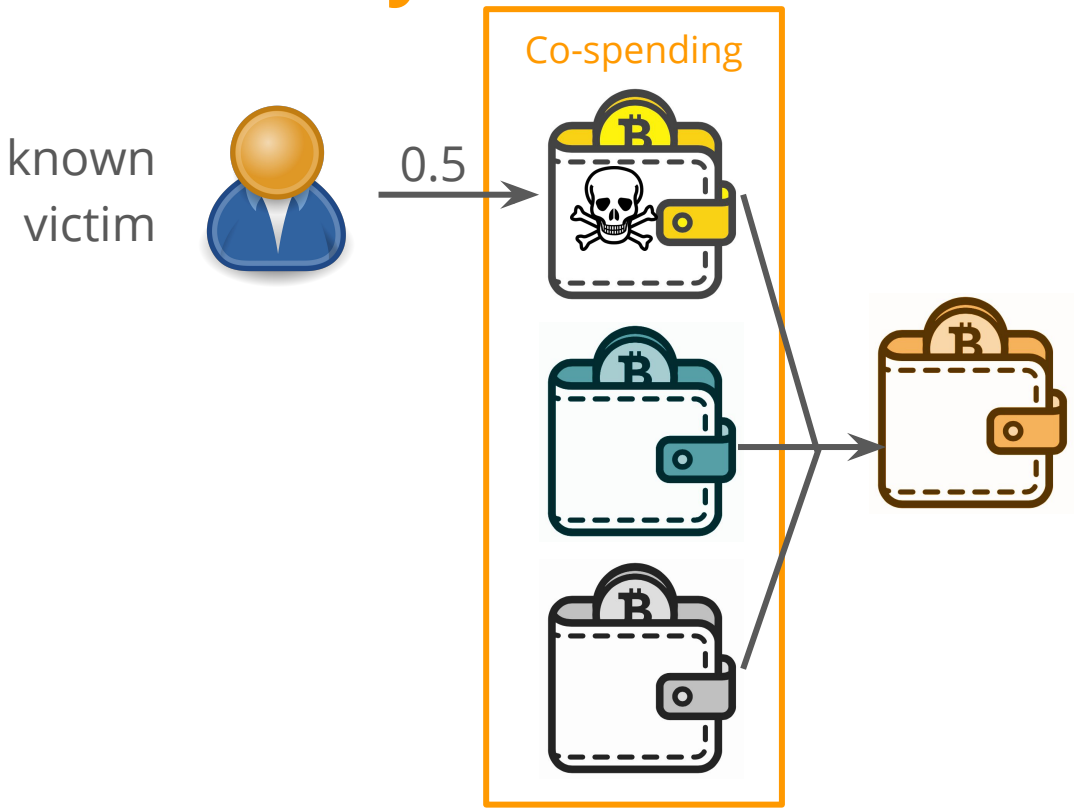

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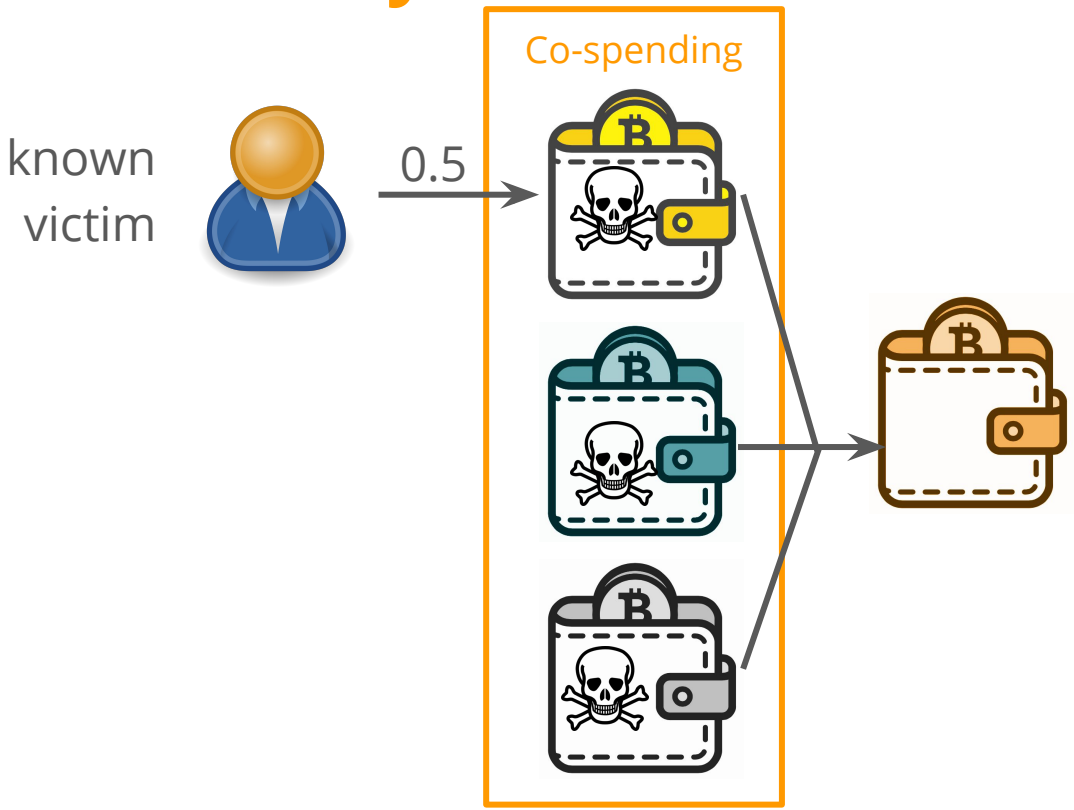

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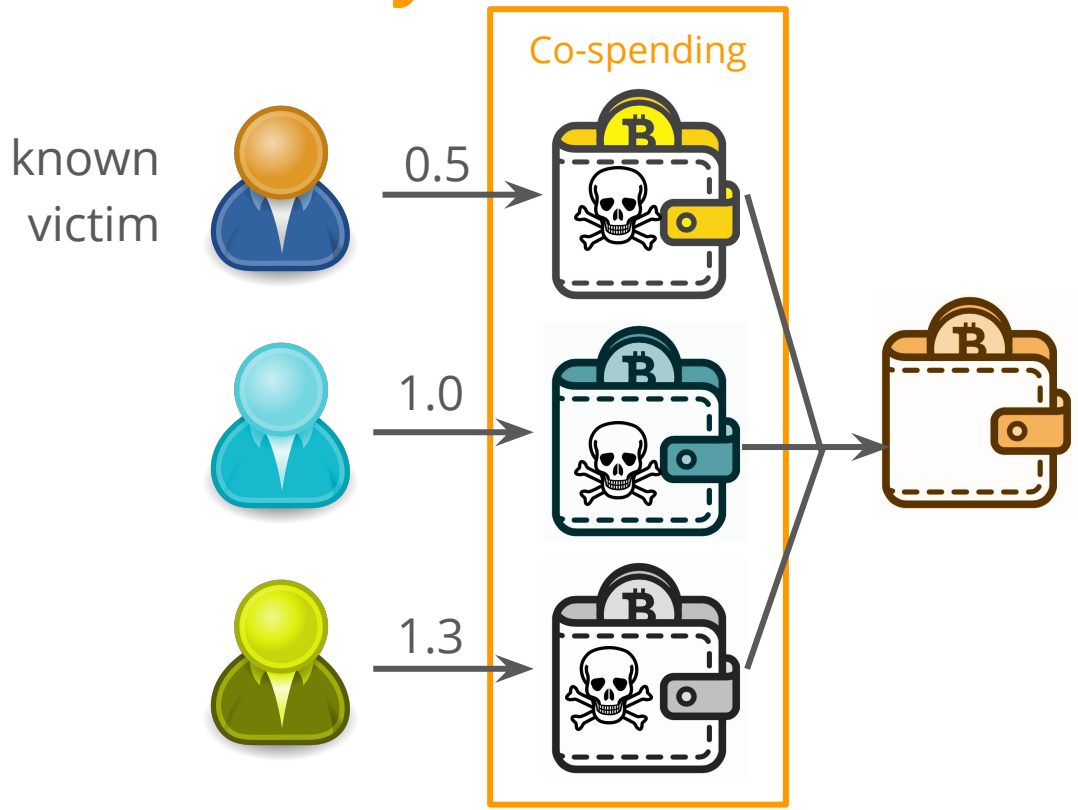

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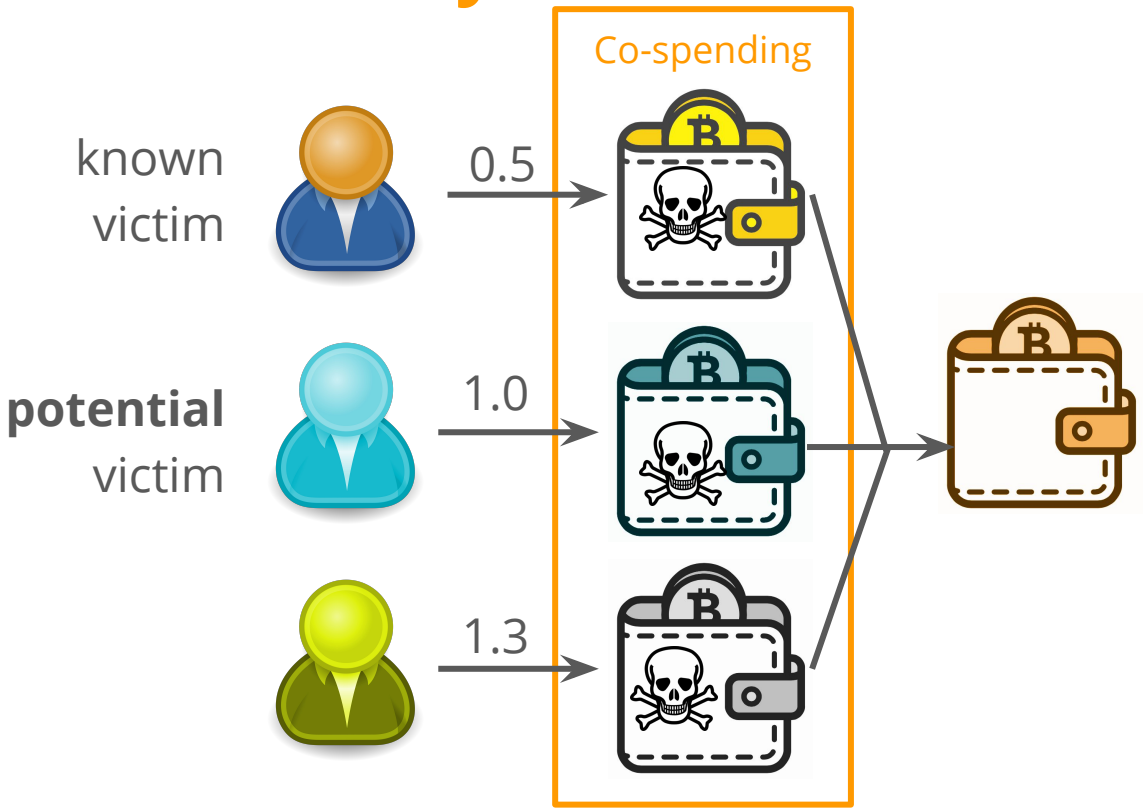

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artificial "victim"

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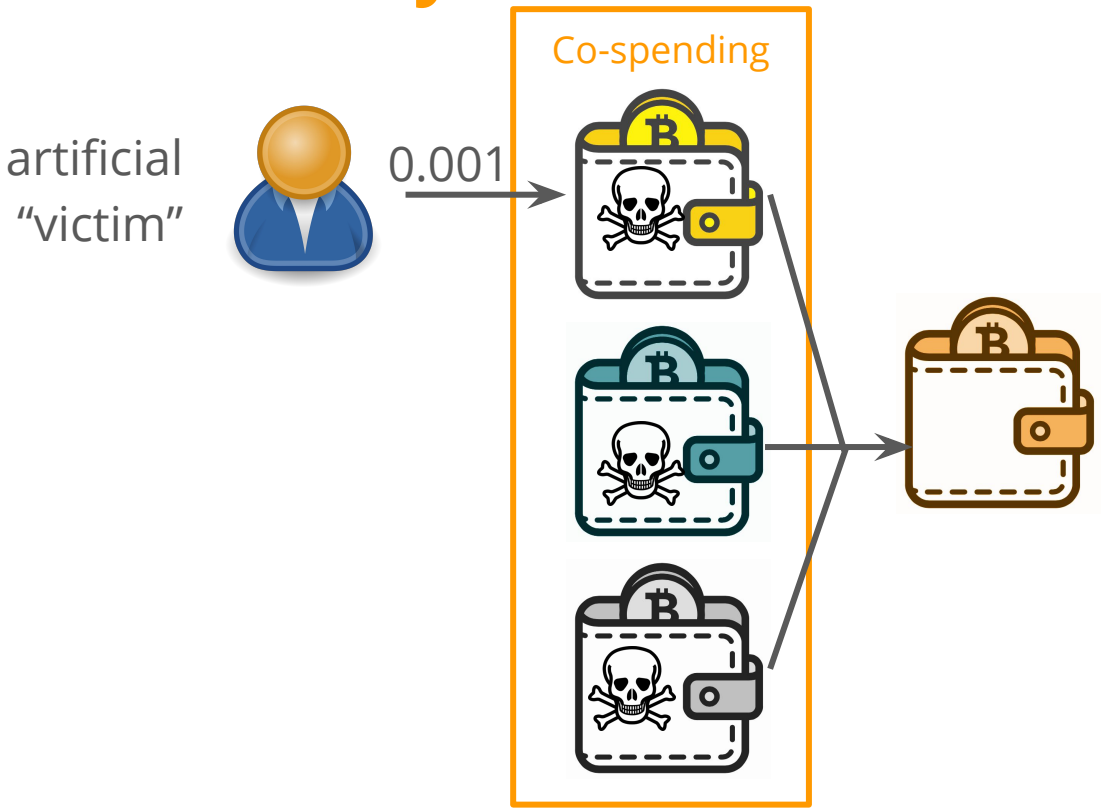

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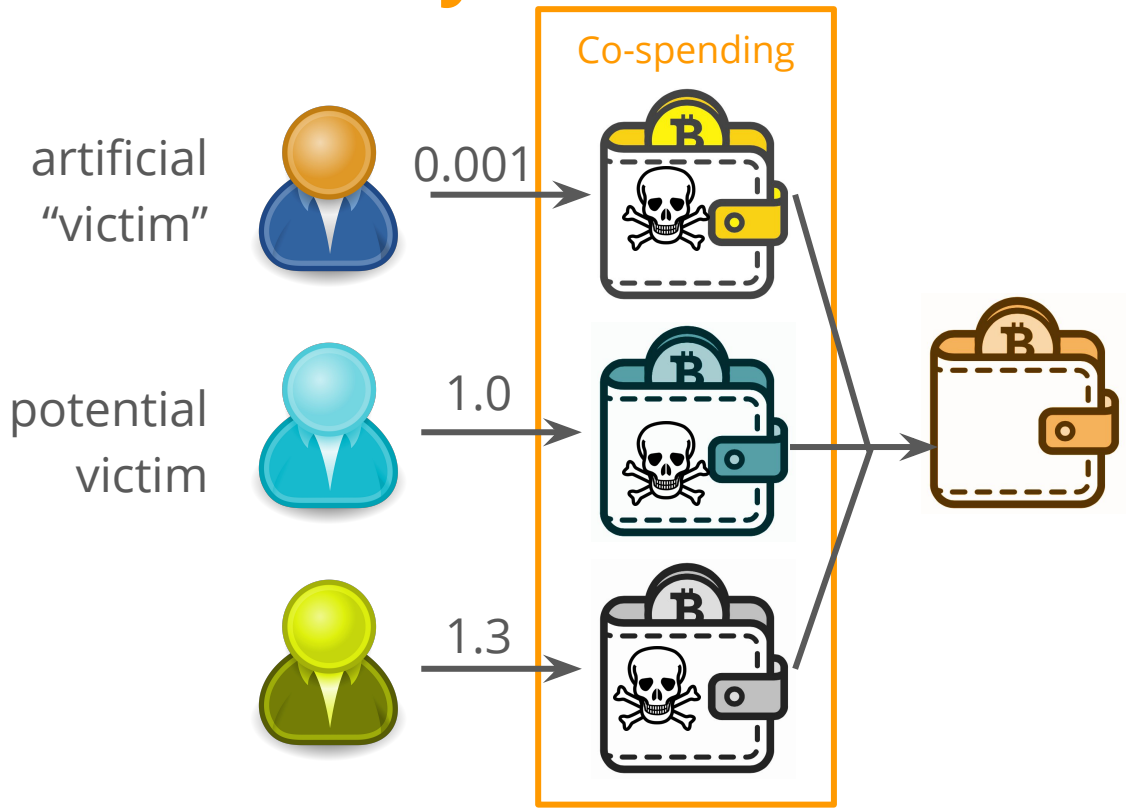
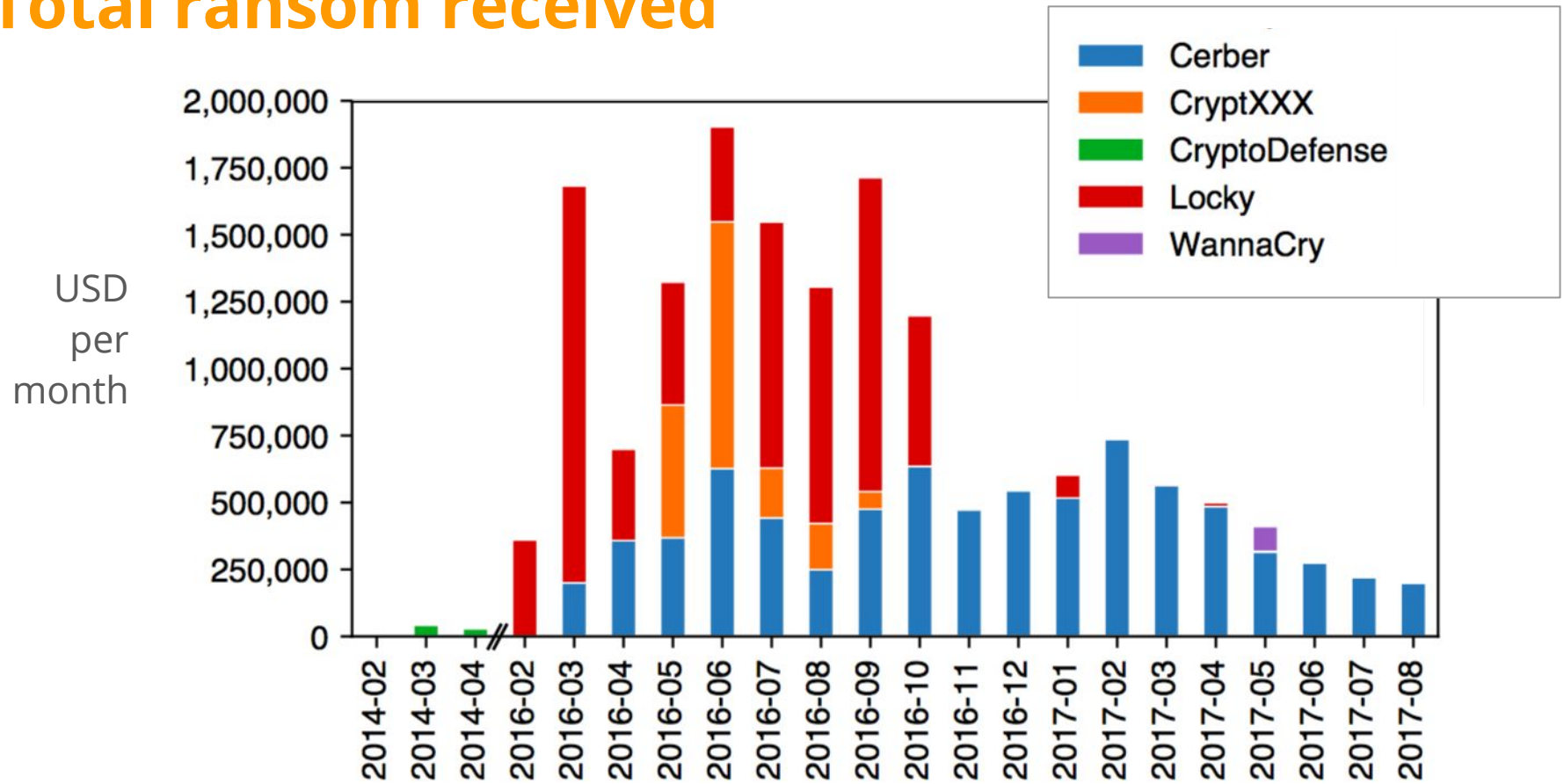


Total ransom received



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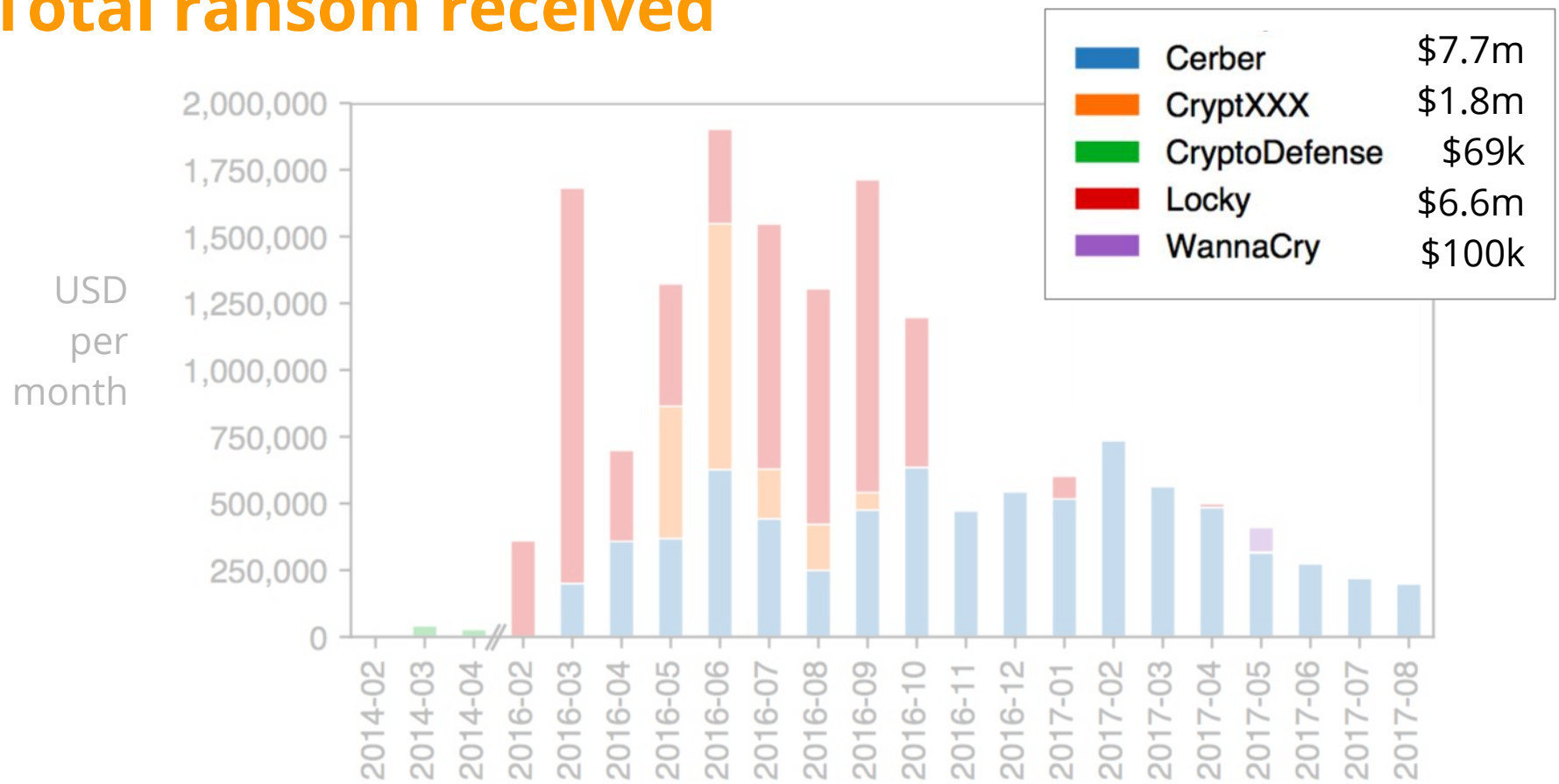
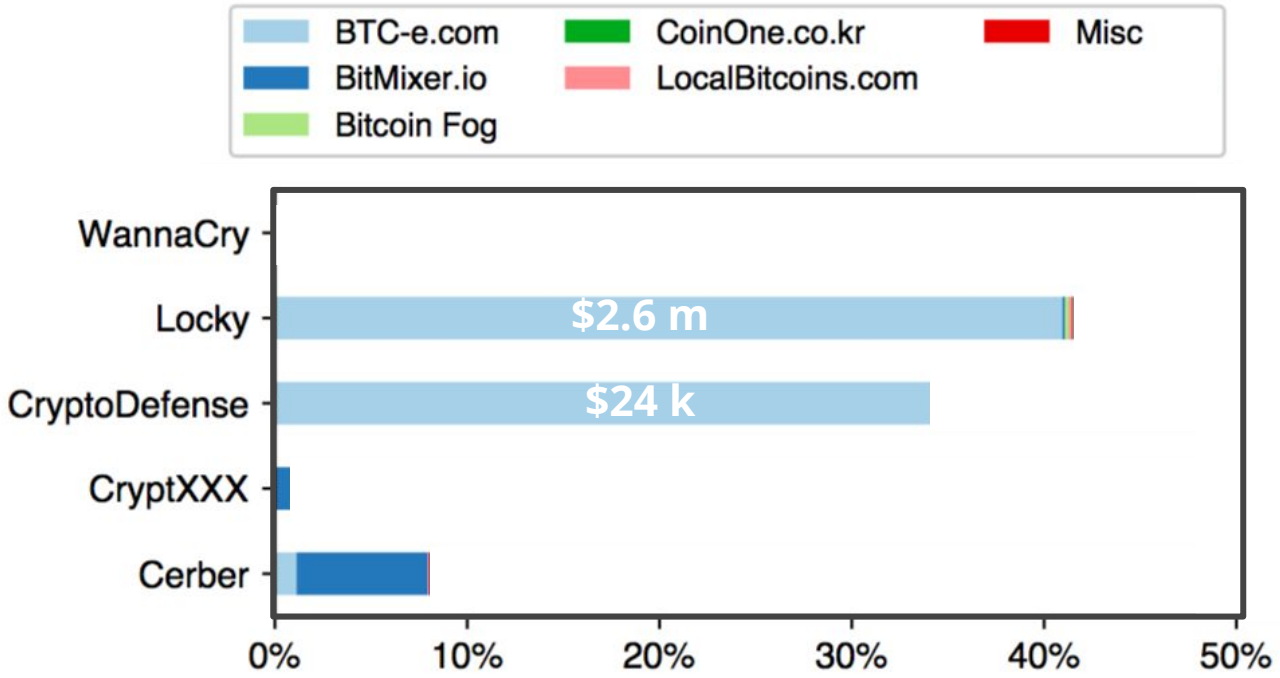


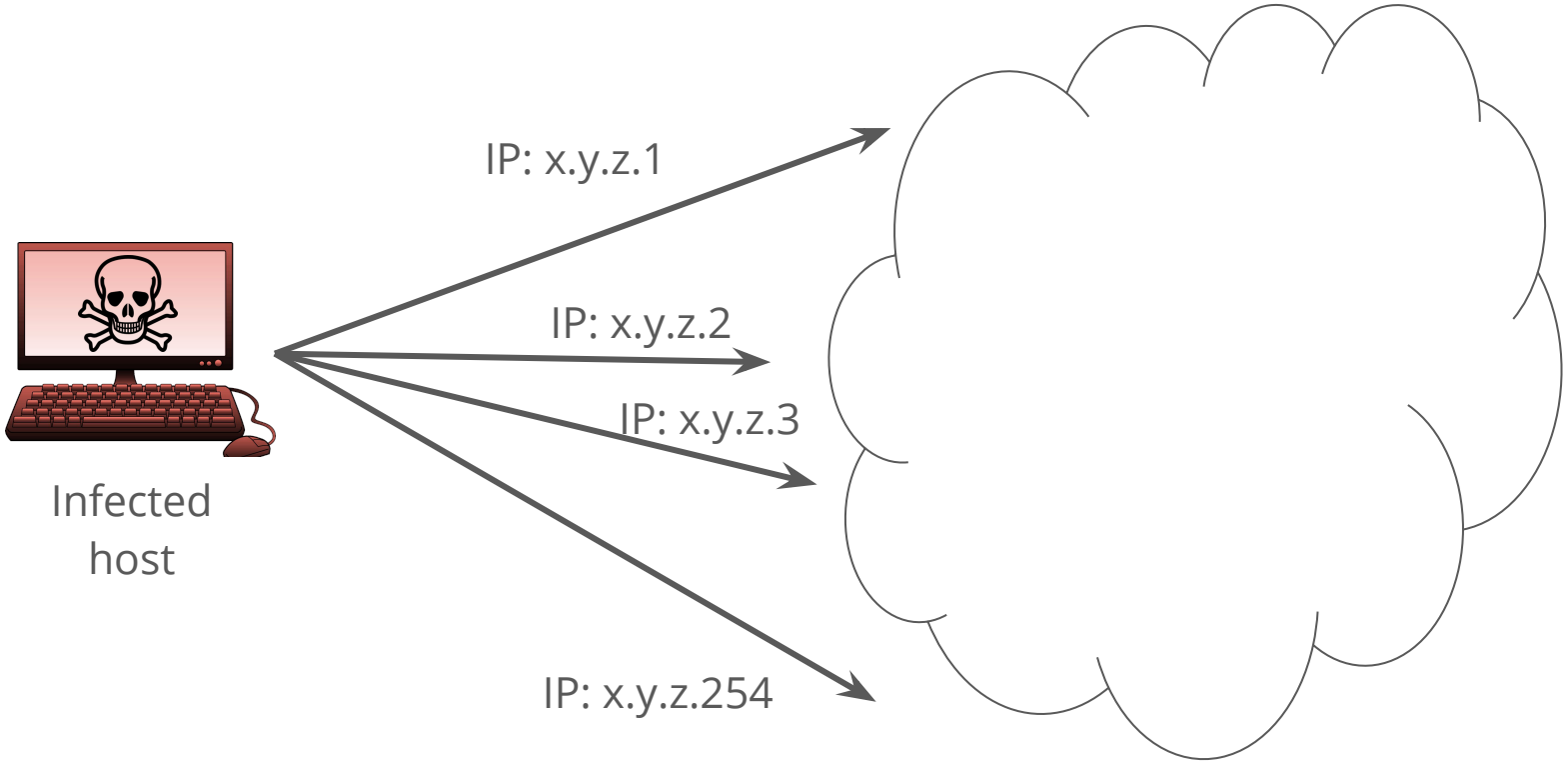
Potential liquidation at exchanges



Fraction of revenue sent to exchanges

2 Reverse Engineering Cerber's C&C

Cerber’s outbound UDP traffic



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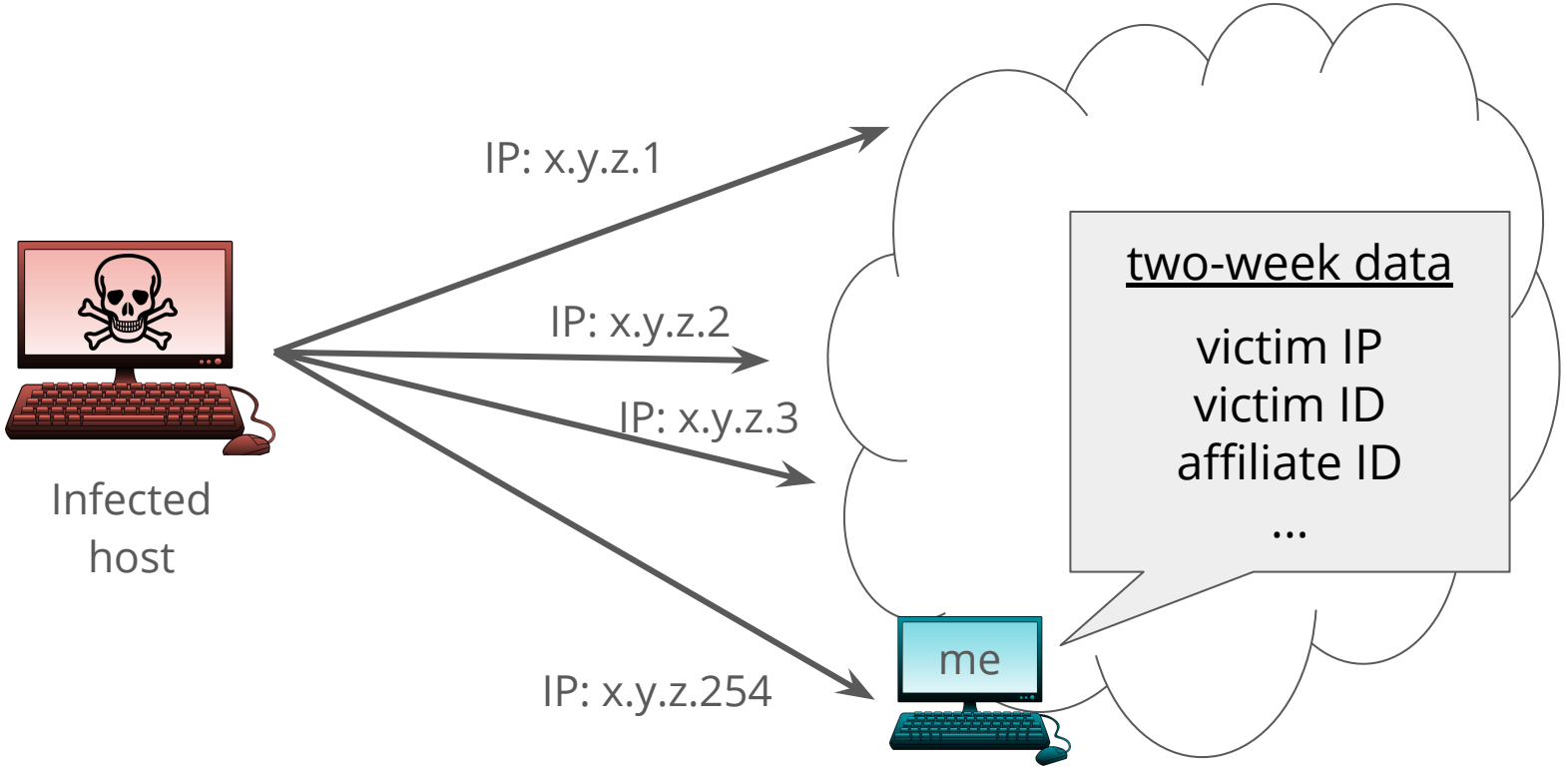
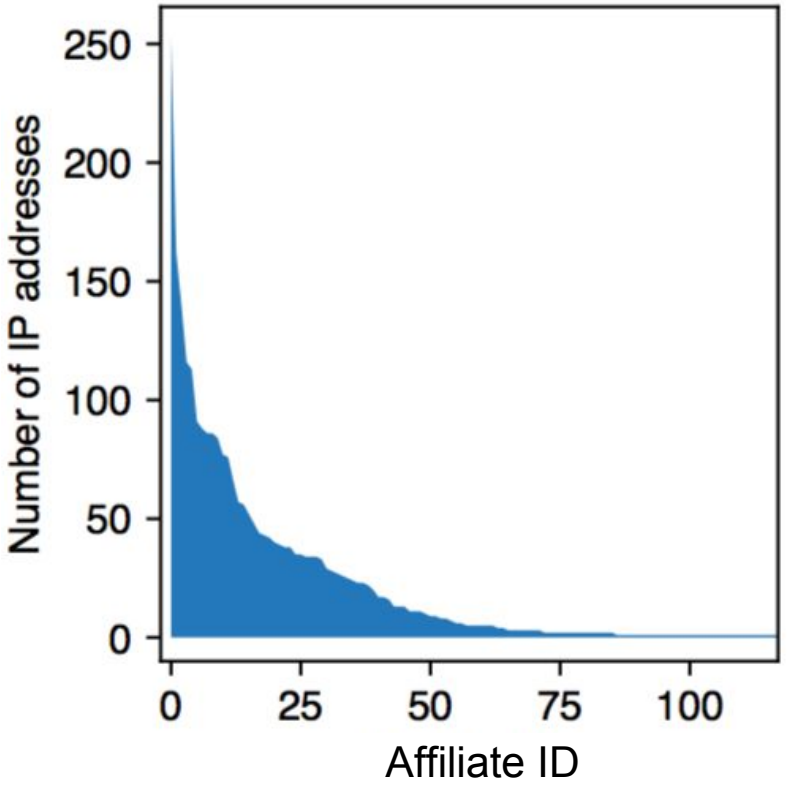
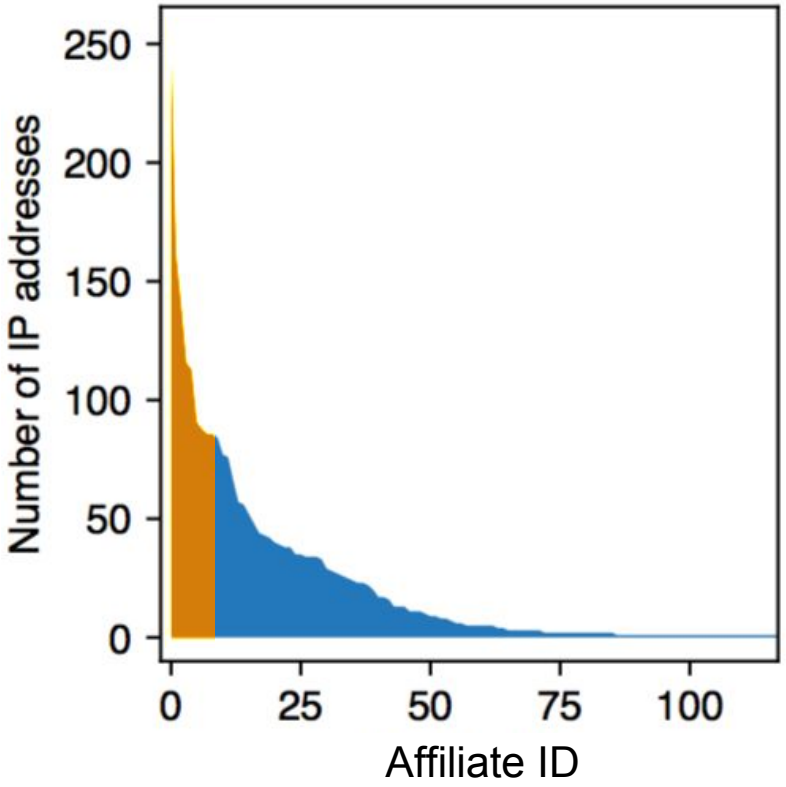


Number of infected IP addr per affiliate



3% of affiliates caused 50% of infected IPs



3 Summary

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Key Methods

Tracked ransom payments for 10 ransomware families using co-spending wallet addr

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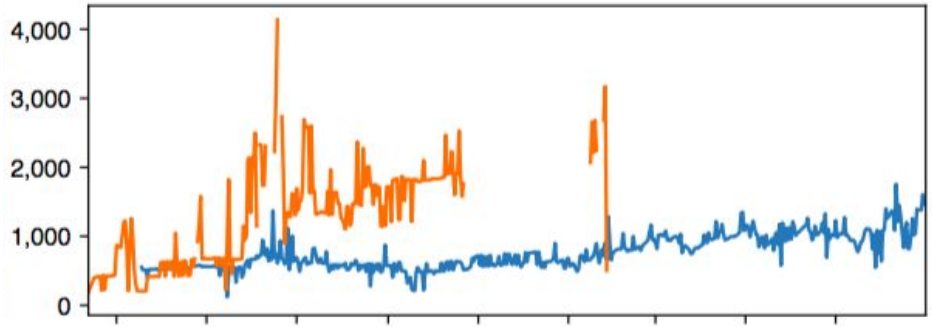
Possible chokepoints:
exchanges and affiliates

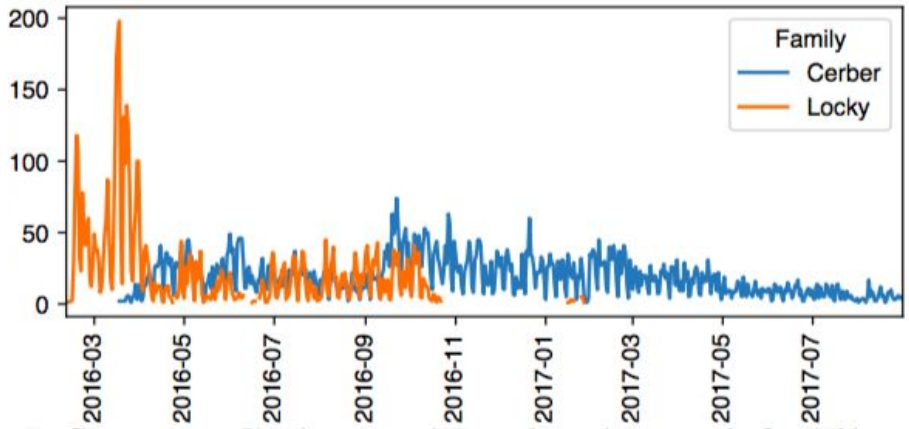
4 Appendix

Ransom payments over time

Median ransom amount per day (USD)



Number of payments per day



Potentially missing Locky's ransom payments

Google results
binaries found
bitcoin payment