Drops for Stuff
An Analysis of Reshipping Mule Scams

Shuang Hao[1] Kevin Borgolte[1] Nick Nikiforakis[2]
Gianluca Stringhini[3] Manuel Egele[4] Michael Eubanks[5]
Brian Krebs[6] Giovanni Vigna[1,7]

[1]UC Santa Barbara [2]Stony Brook University [3]University College London
[4]Boston University [5]Federal Bureau of Investigation
[6]KrebsOnSecurity.com [7]Lastline Inc.

Prevalence of Data Breaches and Theft

- Home Depot breach (2014)
  - 56 million cards
- Target breach (2013)
  - 40 million cards
  - 70 million user info
- Phishing (2013)
  - 37 million users
- Zeus Gameover (2014)
  - 1 million PCs
- Torpig botnet (2008)
  - 0.5 million cards

How to Monetize?

- Limitation of previous monetization methods
  - Direct withdrawal
    - Risk of identity/location exposure
  - Money laundry (money mule)
    - Difficult to wire from credit cards to bank accounts
  - Direct purchase of high-value products for reselling
    - Usually no direct shipping to foreign countries

Reshipping Scam

- Recruit mules to receive and reship packages to cybercriminals overseas
- A major monetization scheme
  - Bypass embargo policies, and hide traces


INTERNET CRIME COMPLAINT CENTER'S (IC3)
SCAM ALERTS
MAY 10, 2011

JOB SCAM USED TO RESHIP MERCHANDISE TO RUSSIA

- Goal: Characterize key aspects of the underground economy behind reshipping scams

Our Work

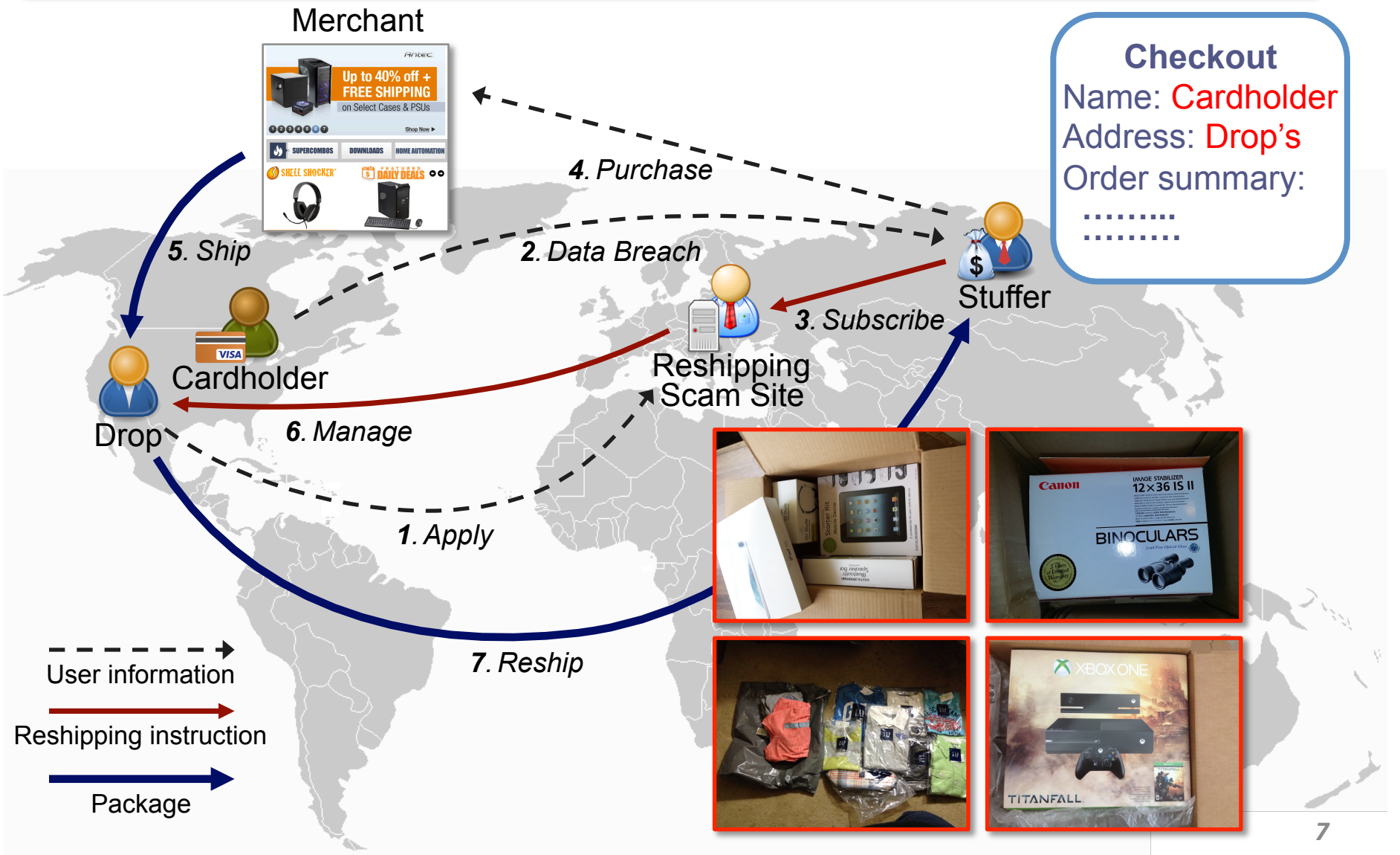
- Analysis of log data from reshipping scams
- Characterization and measurement
  - Operation: business model, targeted products, label purchase
  - Negative effect: scam victims, financial loss
  - Mule: life cycle, geographical locations
- Intervention against reshipping scam services

Roles in Reshipping Scam Ecosystem

- Crime organization
  - Site operator: Manage reshipping scam website
  - Stuffer: Purchase products with stolen cards, and rent mules for reshipping ("*Drops for stuff*")

- Abused parties
  - Drop: Reshipping mule
  - Cardholder: Owner of the stolen card
  - Merchant: Online retail company

Reshipping Scam Operation



Data Summary

- Dataset of 7 reshipping scam sites (site A-G)
  (*Shared by concerned citizens anonymously*)
  - Reshipping logs, prepaid labels, drop records, messages, rules and disclaimers
- Address information (city-level) of drops in U.S.
  (*Shared by the law enforcement*)

Site	*Time Period*	*Reshipping Logs*	*Prepaid Labels*	*Drop Records*
Site-A	11 months (2015)	1,960	846	88
Site-B	9 months (2014)	1,493	-----	43
Site-C	9 months (2015)	5,996	-----	106
Site-D	4 months (2014)	-----	613	-----
Site-E	12 months (2011)	-----	835	-----
Site-F	2 months (2011)	991	-----	-----
Site-G	1 month (2013)	-----	-----	54

Operation Policies

- How to split the illicit profit?
- What are the main targeted products?
- How to acquire prepaid shipping labels?

Agreement and Profit Split

- Reshipping as a service
  - Percentage cut: up to 50% value (high-value products)
  - Flat rate: $50-$70 per package (lower-priced products)

- "Customer service" and compensation
  - Drop status ("active" or "problematic")
  - 15% compensation for lost packages, or free shipping

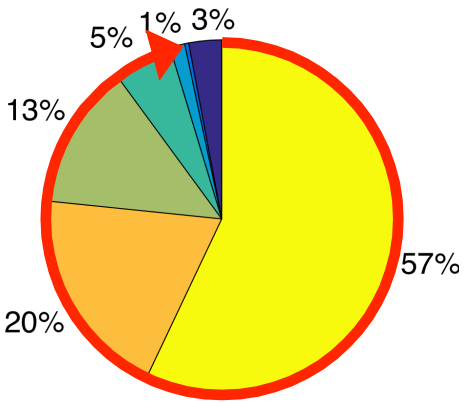
Products

- Category prices and proportions

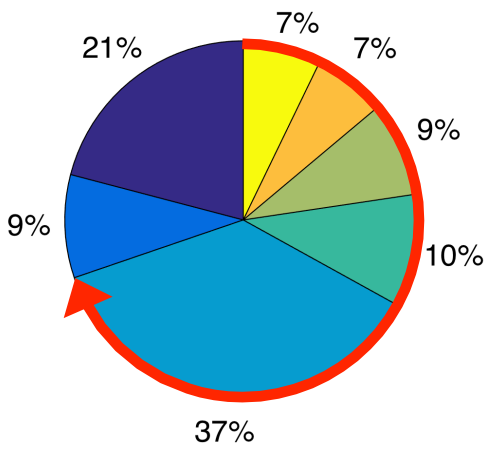
Electronics

Product Category	Median Price (Site-C)
Apple Products	$750
Camera Related	$500
Computer related	$1,030
Other Electronics	$550
Fashion and Apparel	$1,000
Nutrition	$1,050
Miscellaneous	$689

Site-C



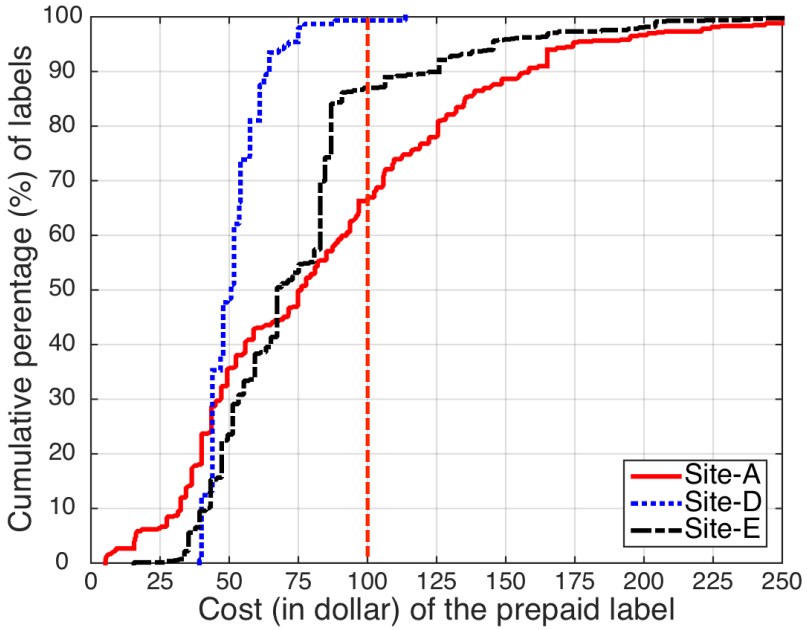
Site-B



Above 70% of the products are electronics and luxury clothing

Label Purchase

- Move from fraudulent labels towards “white labels”
  - Paid with cybercrime-funded bank accounts



The “white labels” have relatively cheap prices, less than $100 per package

Negative Effect

- Who are negatively affected?
- How much is the financial loss?

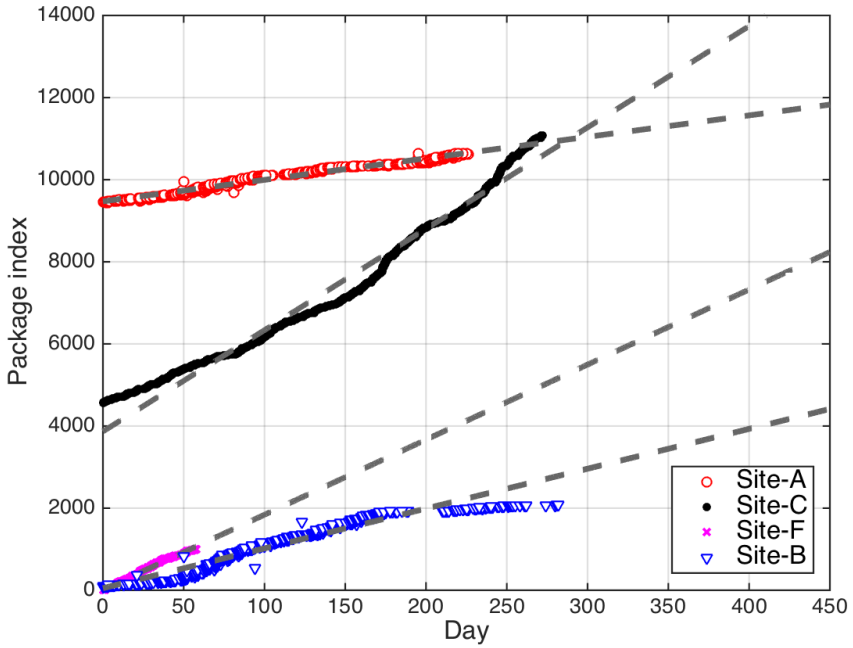
Victims

- Main victims
  - Merchant: Liability to reimburse cardholders, loss of products, chargeback (up to $100)
  - Drop: Fake job with no payment, identity fraud

- Other victims
  - Cardholder
  - Card issuer
  - Destination country

Revenue Estimate

- From packages to revenue



- Estimated package number per year

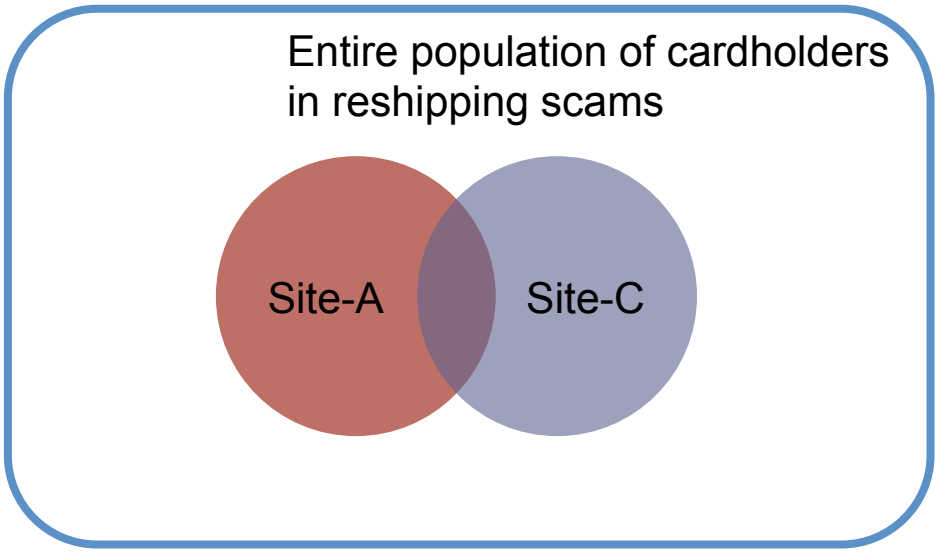
Site-C	9,009
Site-F	6,673
Site-B	3,541
Site-A	1,911

- Revenue = # packages x average product price

Site-specific revenue is up to $7.3 million per year

Overall Revenue Estimate

- Capture-recapture to infer the number of total cardholders



- Population estimate

$$= \frac{|A| \times |C|}{|A \cap C|}$$

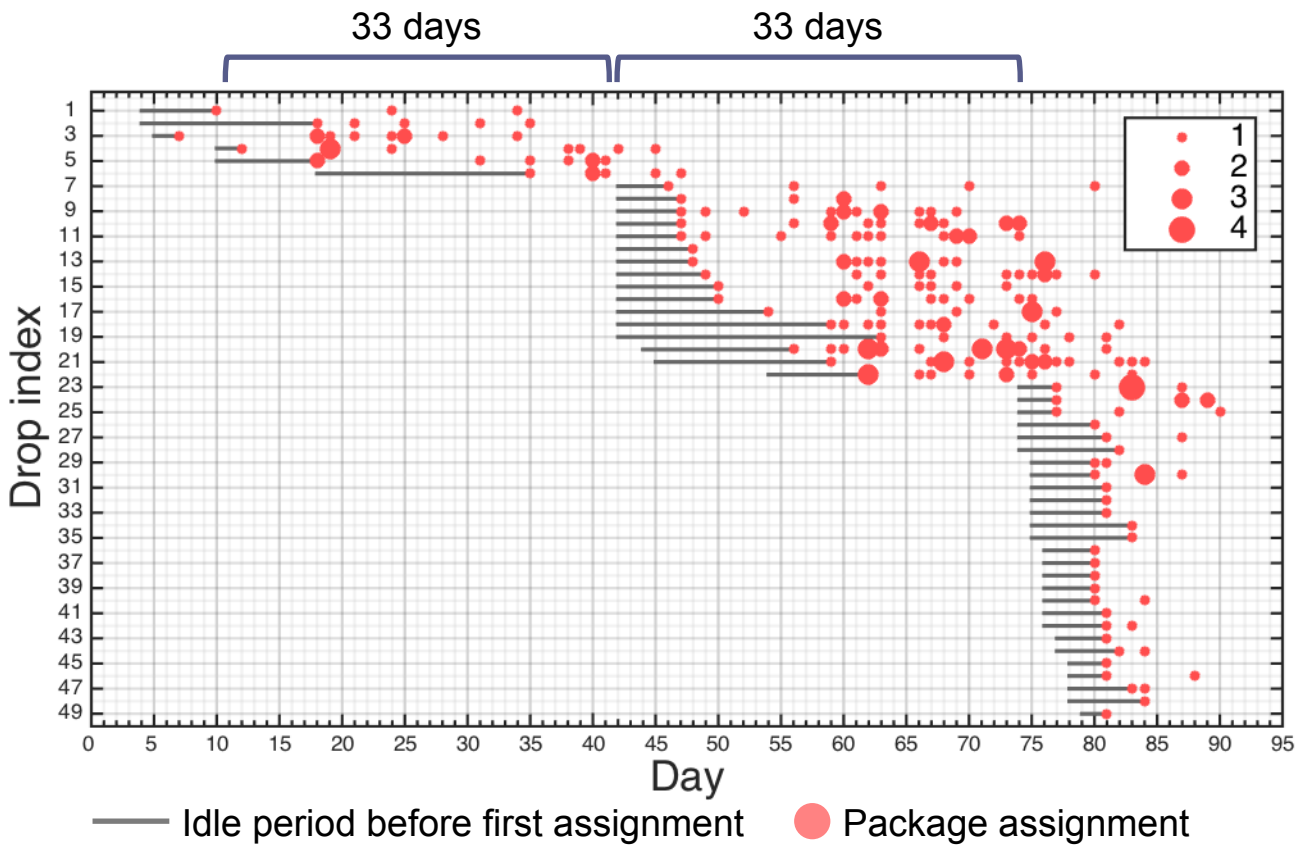
≈ 1.6 million victim cardholders per year

Overall estimated revenue is $1.8 billion per year

Drop Recruitment

- How long do drops remain active?
- Where are the drops?

Life Cycle of Drops



I know the pay is only once a month so when will I receive my first check!?

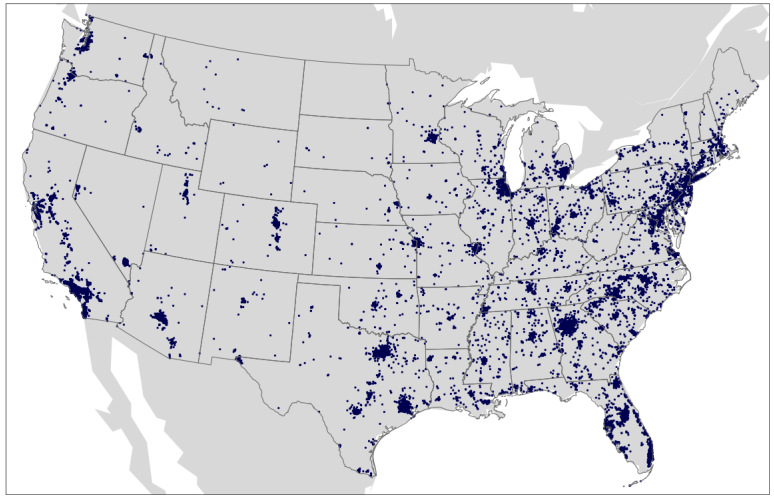
What time will I be paid!?

When will my check be deposited!?

Drops are abandoned without getting paid after about 30 days

Locations of Drops

- Drop likelihood = # drops in state / population of state



	State	Drop likelihood	Diff to US 2014 US Annual Unemployment Rate
1	Georgia	0.01099%	▲ +1.0%
2	Nevada	0.01011%	▲ +1.6%
3	Delaware	0.00951%	▼ –0.5%
4	Florida	0.00919%	▲ +0.1%
5	Maryland	0.00868%	▼ –0.4%
6	North Carolina	0.00710%	▼ –0.1%
7	Mississippi	0.00674%	▲ +1.6%
8	Arizona	0.00667%	▲ +0.7%
9	Illinois	0.00608%	▲ +0.9%
10	Virginia	0.00599%	▼ –1.0%

Scammers target unemployed or underemployed groups to recruit drops

Intervention Approaches

- Vantage points at shipping service companies
  - Patterns in package tracking
  - Accounts of label purchases
  - Shipping destinations

Reshipping Destinations

- Top destination cities from reshipping scam sites

Site	*Destination*	*Label Percentage*
Site-A	Moscow area, Russia*	85.89%
	Claymont, DE, US	6.08%
	Dover, DE, US	2.43%
Site-D	Moscow area, Russia*	89.07%
	Kiev, Ukraine	10.11%
	Nikolaev, Ukraine	0.49%
Site-E	Moscow, Russia	91.14%
	Krasnodar, Russia	4.36%
	Stavropol, Russia	1.45%

* Including Moscow, Balashiha, and Zheleznodorozhnyj

At least 85% packages are shipped to Moscow and its suburbs

Conclusion

- Reshipping scam is prolific: Yearly revenue up to $7.3 million of a single site, and overall estimated $1.8 billion
- We provided detailed analysis on operation policies, targeted products, “white labels”, and drop recruitment
- We proposed approaches to intercept reshipping packages

http://www.cs.ucsb.edu/~shuanghao