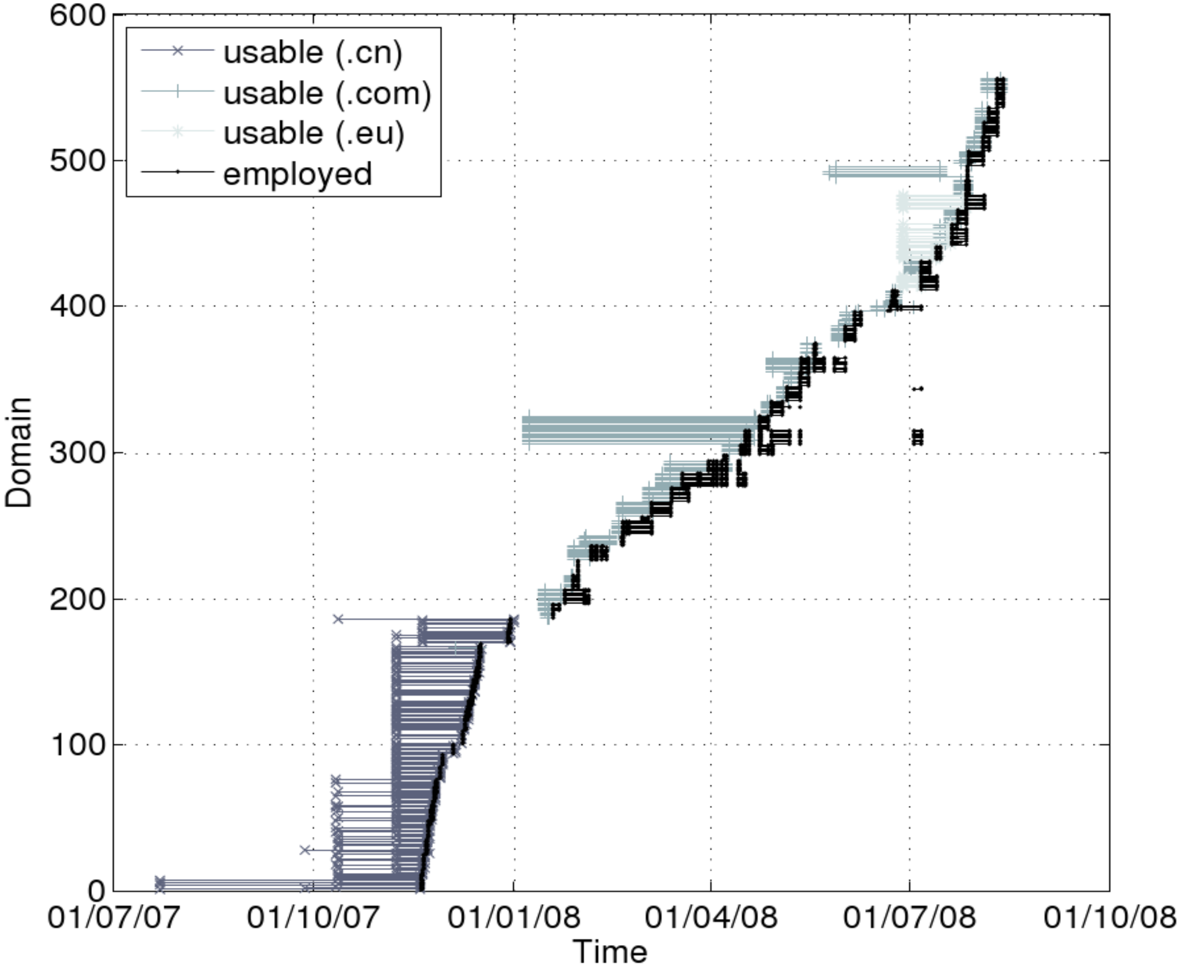
On the Potential of Proactive Domain Blacklisting

Márk Félegyházi, Christian Kreibich and Vern Paxson

ICSI, Berkeley

Spam domain registrations



Kreibich et al., “Spamcraft: An inside look at spam campaign orchestration” LEET 2009
(CCIED: The Collaborative Center for Internet Epidemiology and Defenses)

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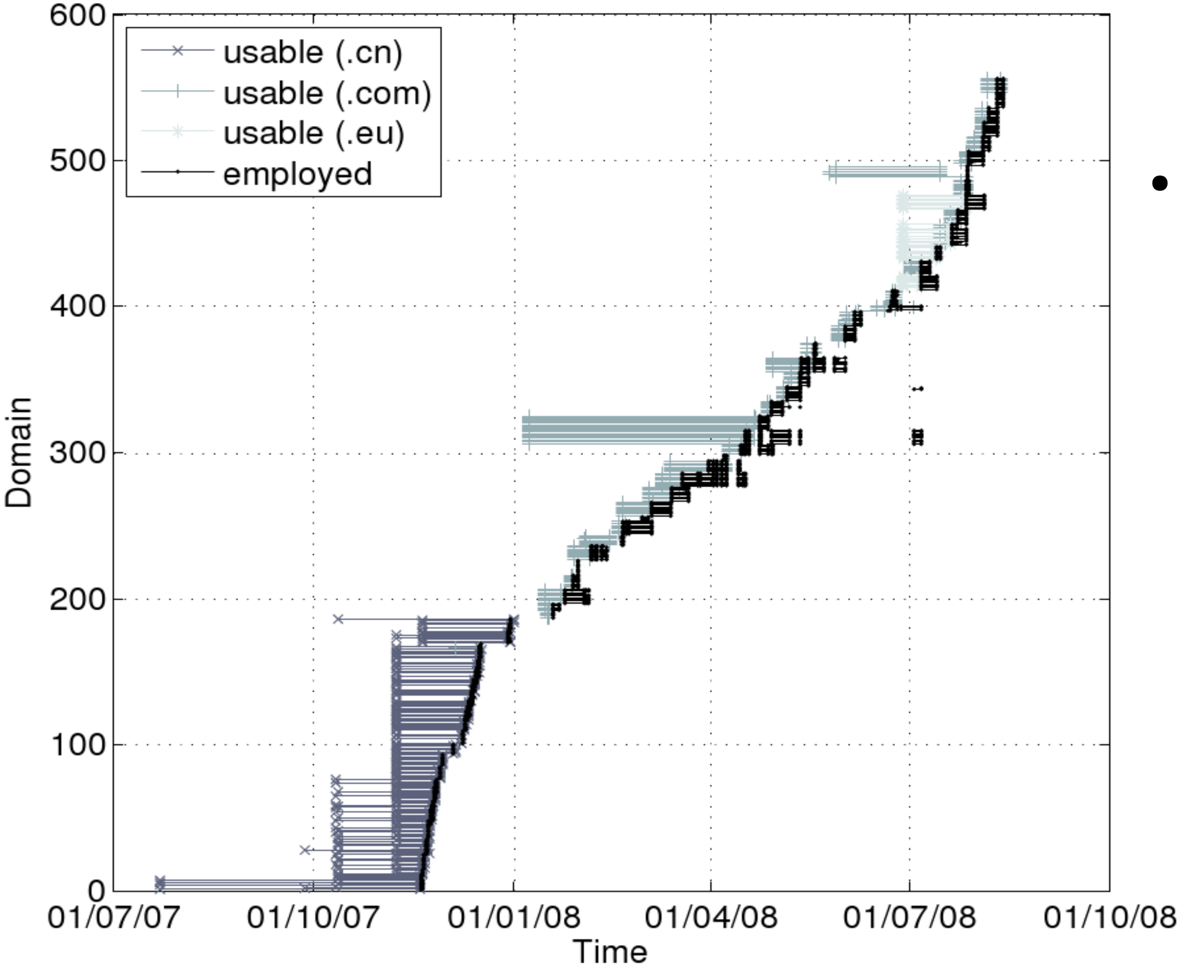

- domains dropped soon after blacklisted

Kreibich et al., “Spamcraft: An inside look at spam campaign orchestration” LEET 2009
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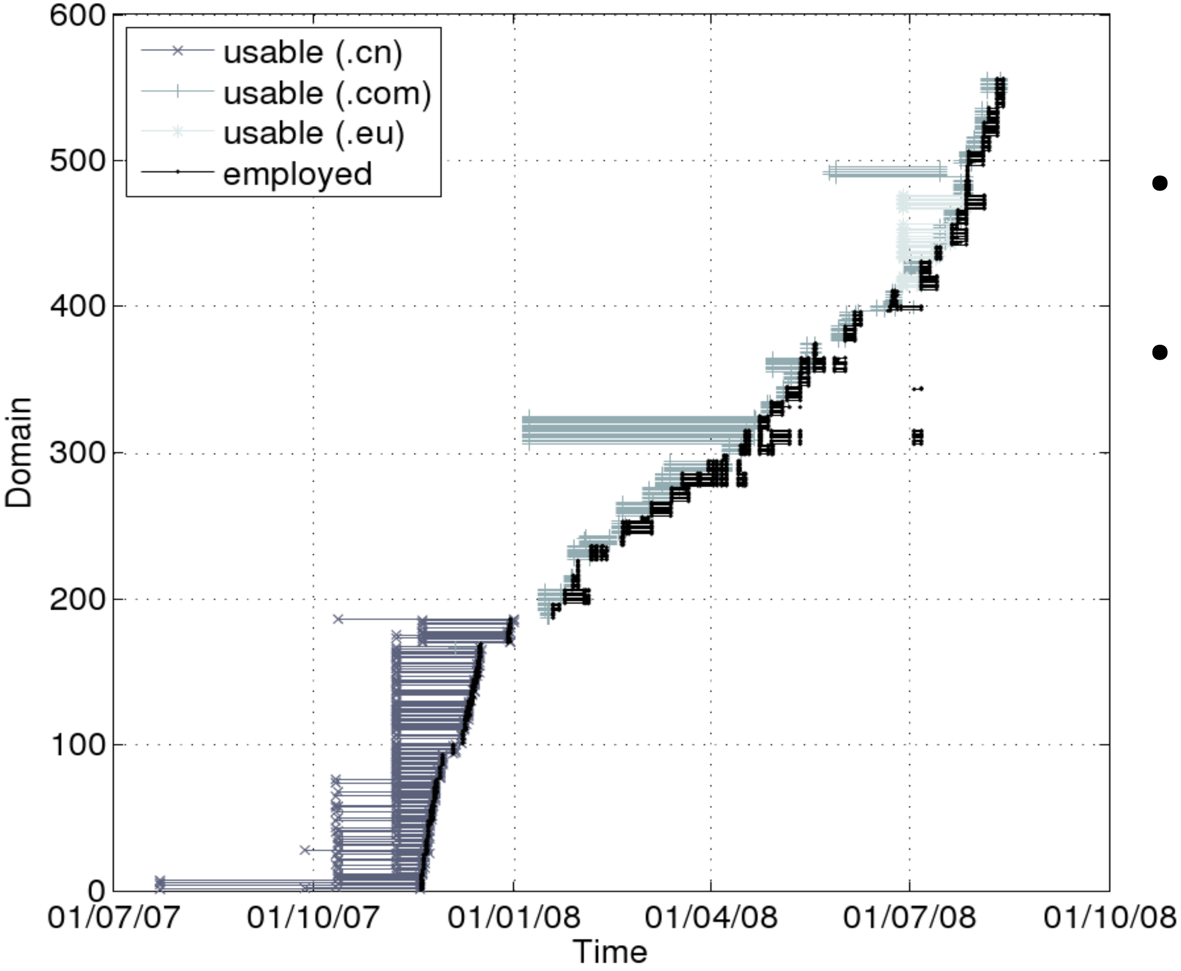

- domains dropped soon after blacklisted
- domains registered in batches

Kreibich et al., “Spamcraft: An inside look at spam campaign orchestration” LEET 2009
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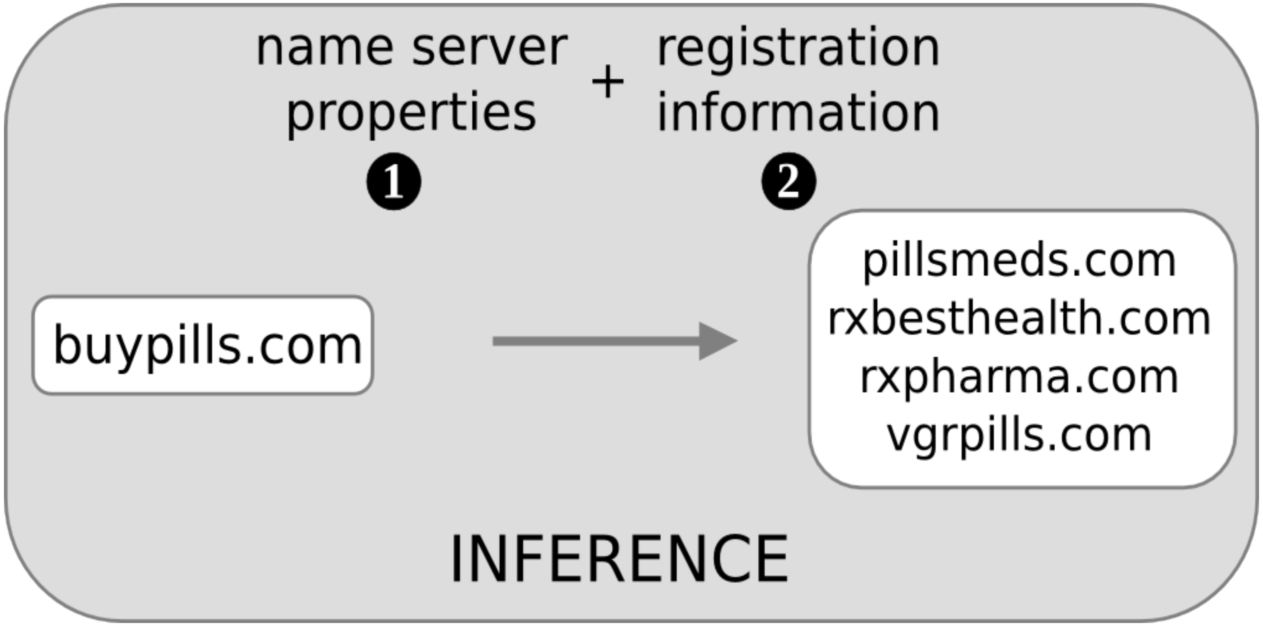
Proactive domain clustering



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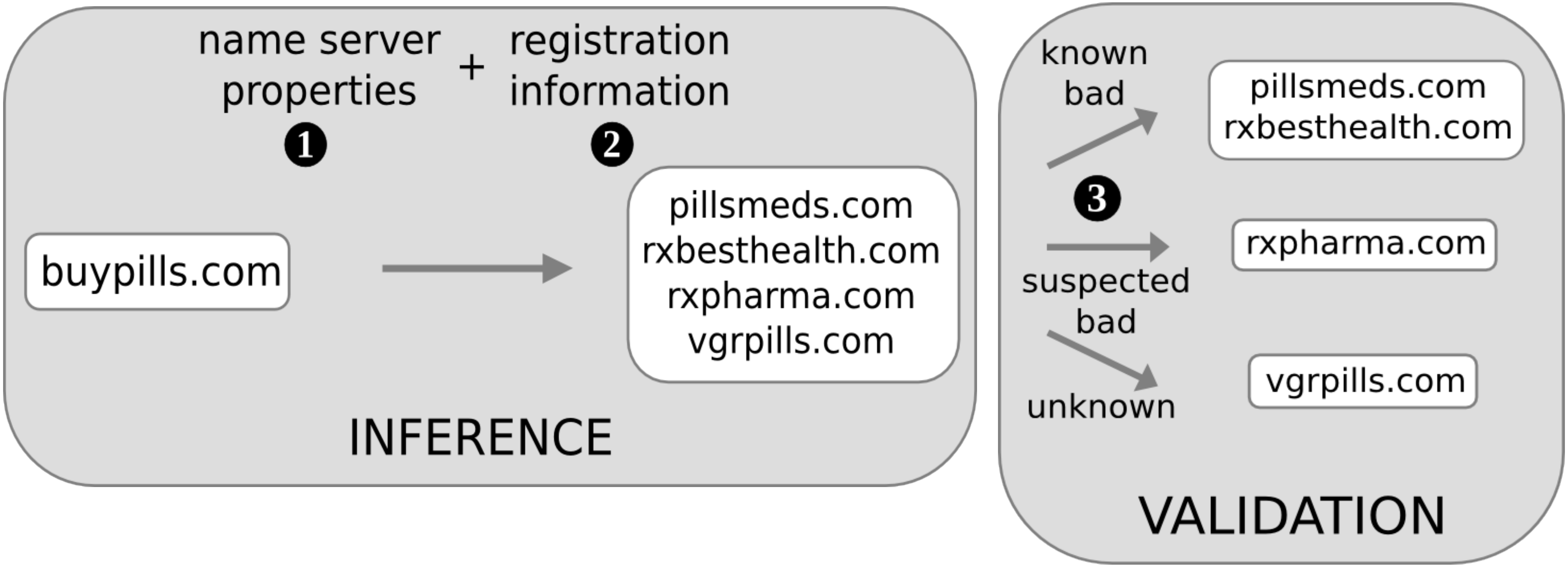

Name server features

.COM zone file - NS records

buypills.com

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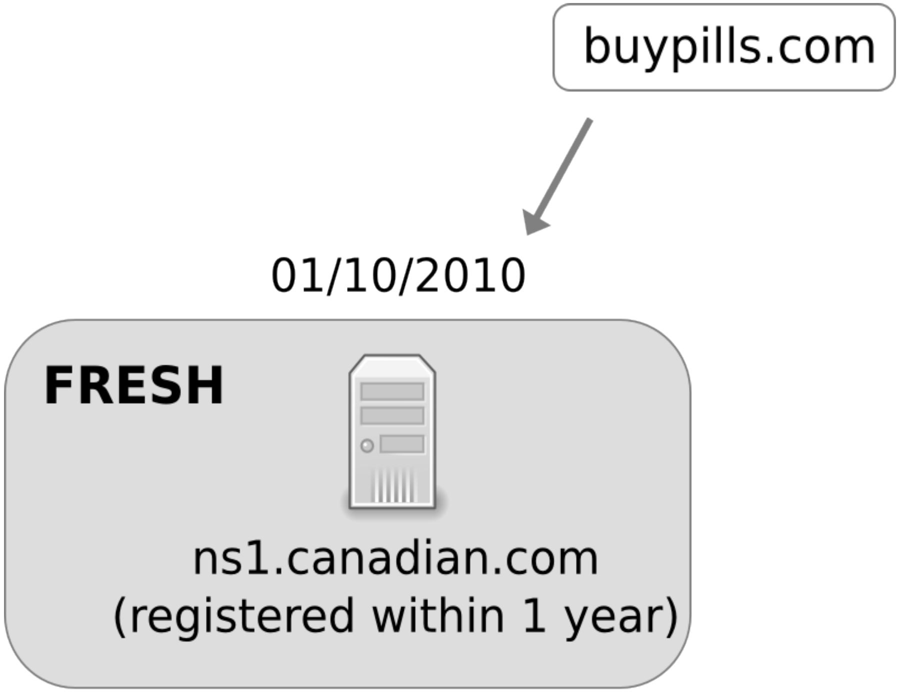

buypills.com

01/10/2010

FRESH

ns1.canadian.com
(registered within 1 year)

Name server features

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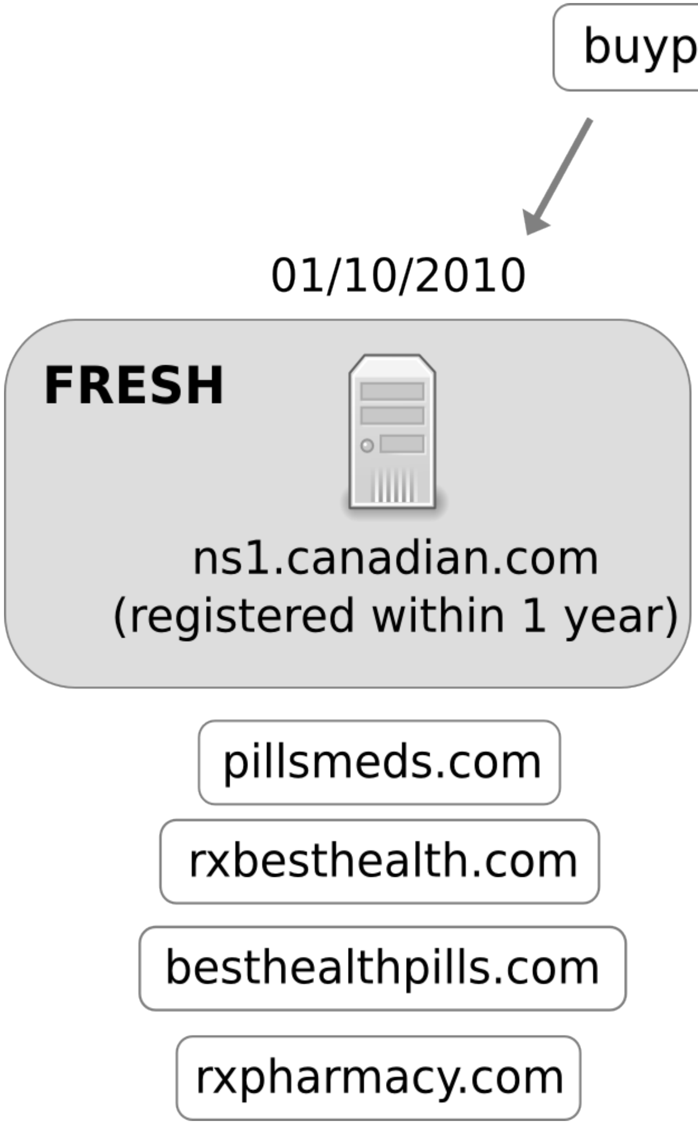

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pillsmeds.com

rxbesthealth.com

besthealthpills.com

rxpharmacy.com

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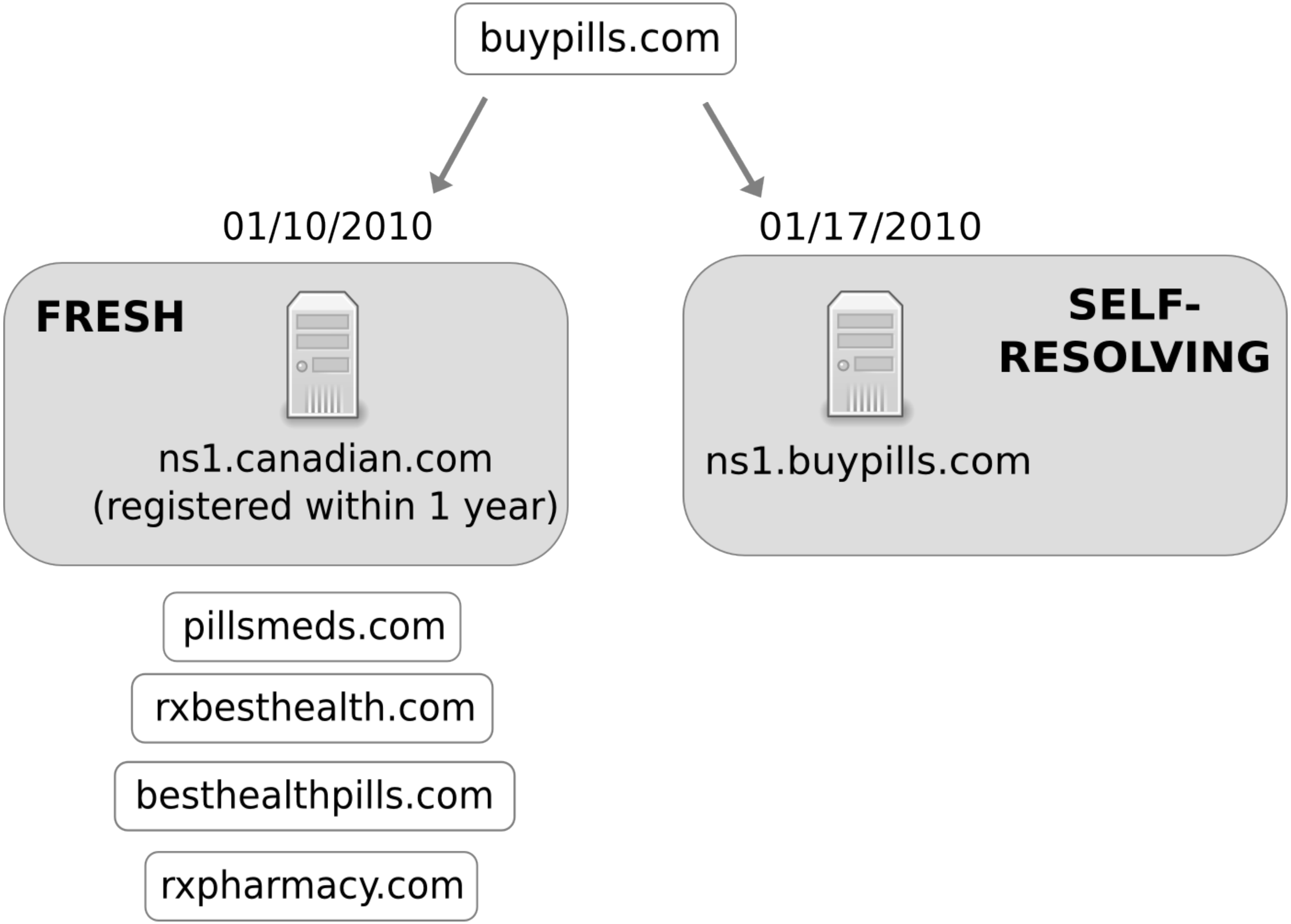

buypills.com

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01/17/2010

SELF-RESOLVING

ns1.buypills.com

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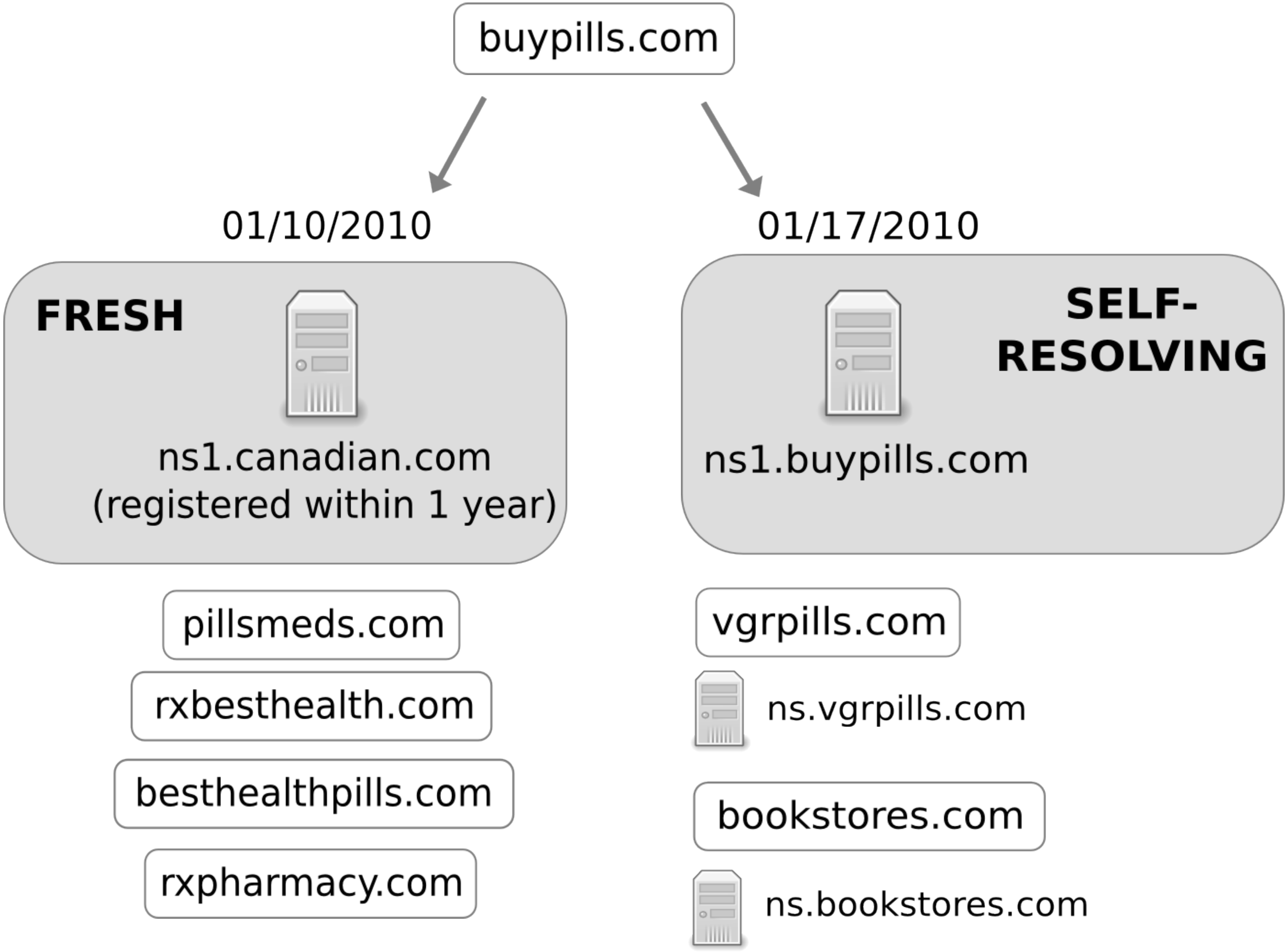

Registration features

WHOIS registry records

buypills.com

01/09/2010 - Enom

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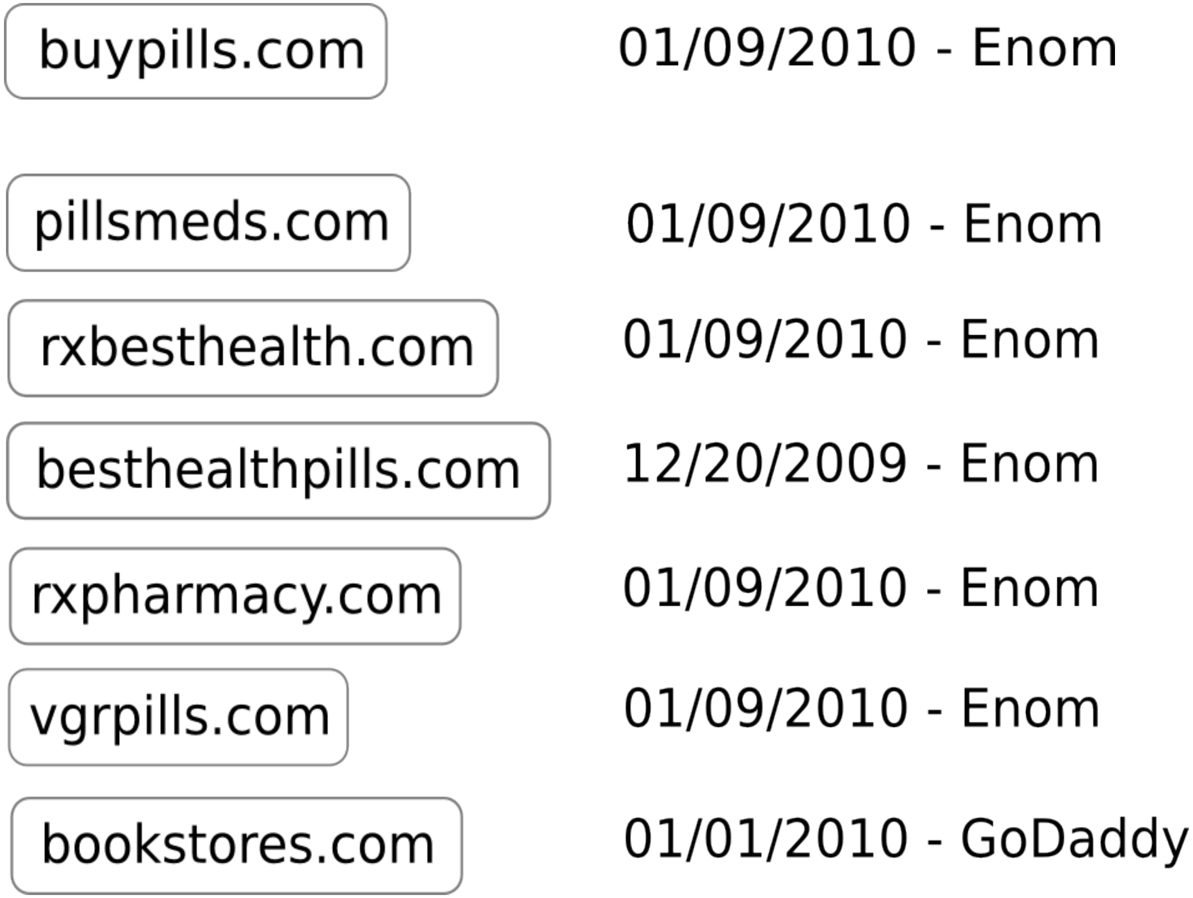

buypills.com	01/09/2010 - Enom
pillsmeds.com	01/09/2010 - Enom
rxbesthealth.com	01/09/2010 - Enom
besthealthpills.com	12/20/2009 - Enom
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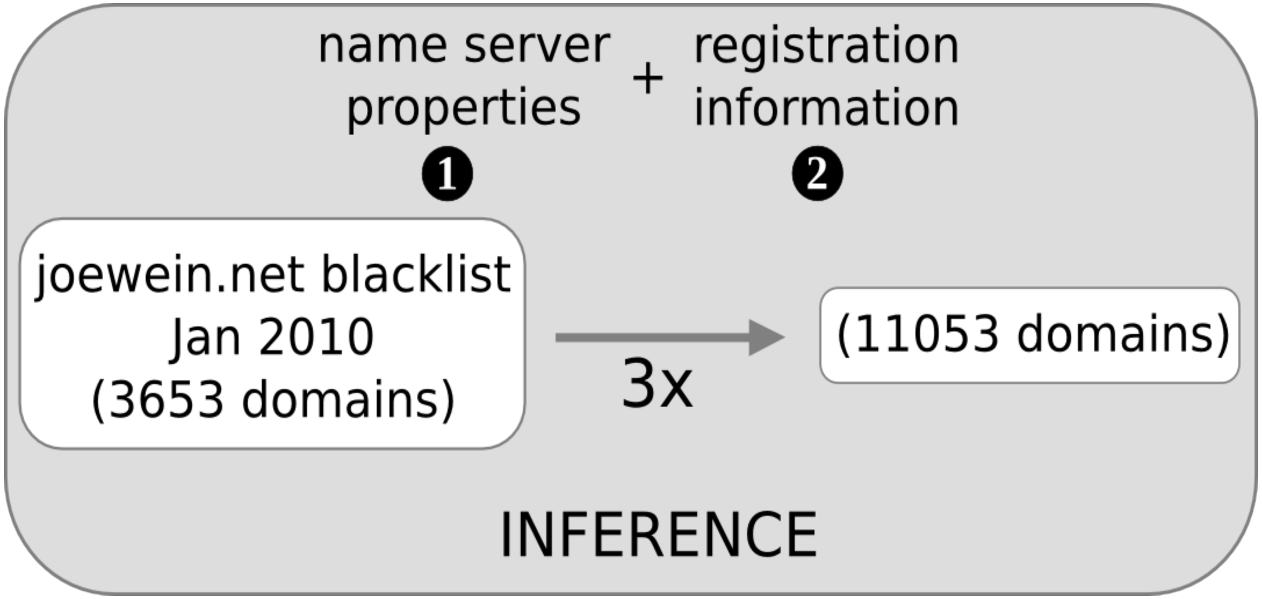
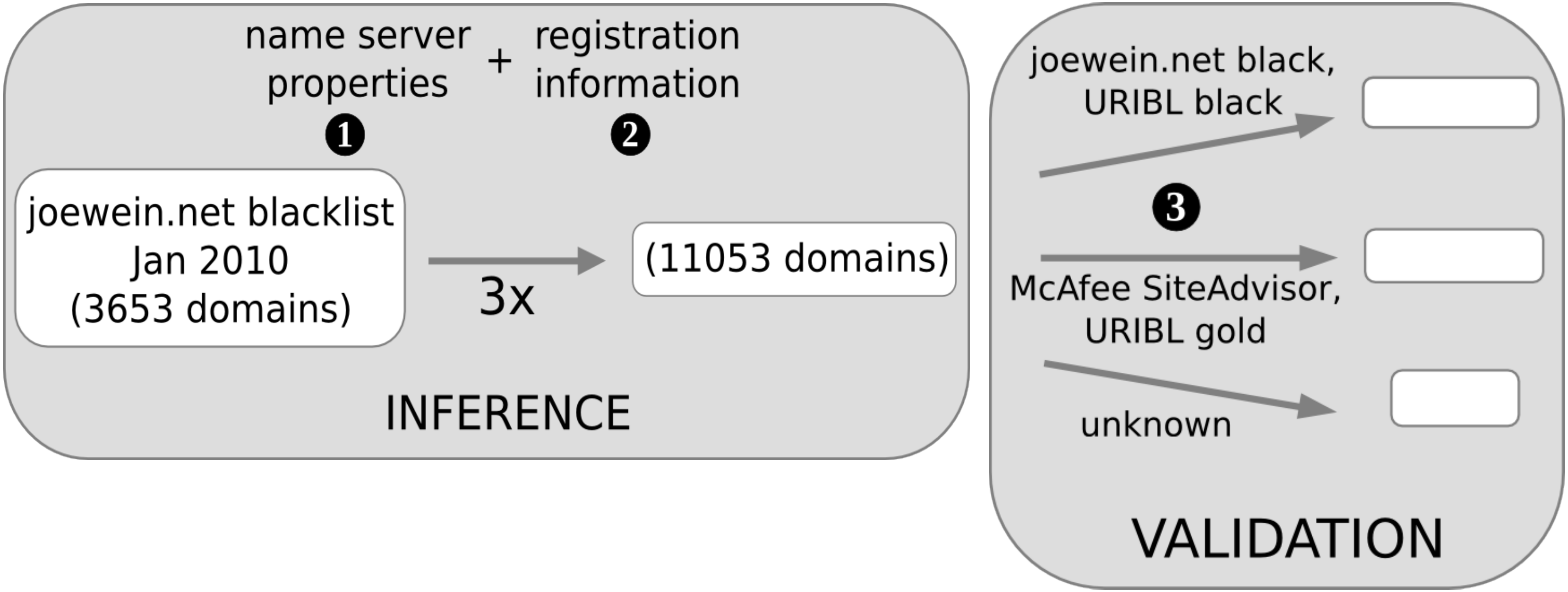
Evaluation


name server properties
+
registration information
1
2
joewein.net blacklist Jan 2010 (3653 domains)
3x
(11053 domains)
INFERENCE

Evaluation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INFERENCE
joewein.net black,
URIBL black
❸
McAfee SiteAdvisor,
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unknown
VALIDATION

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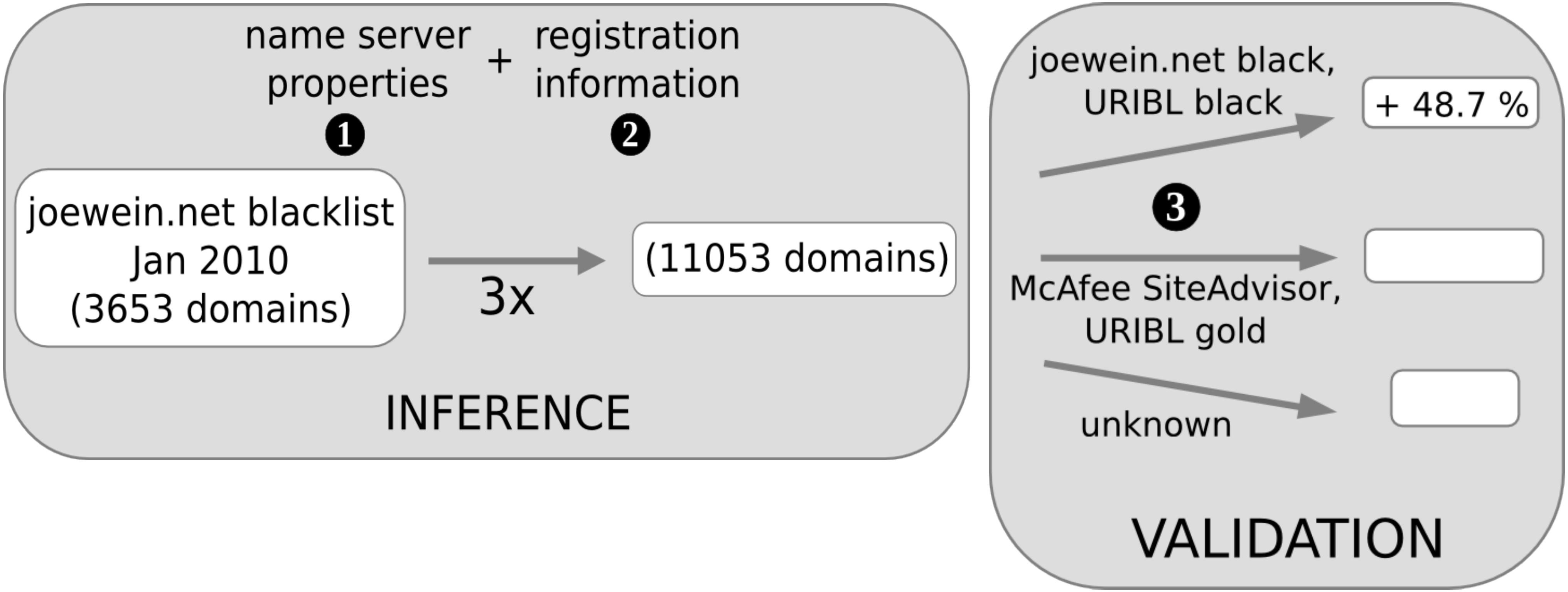
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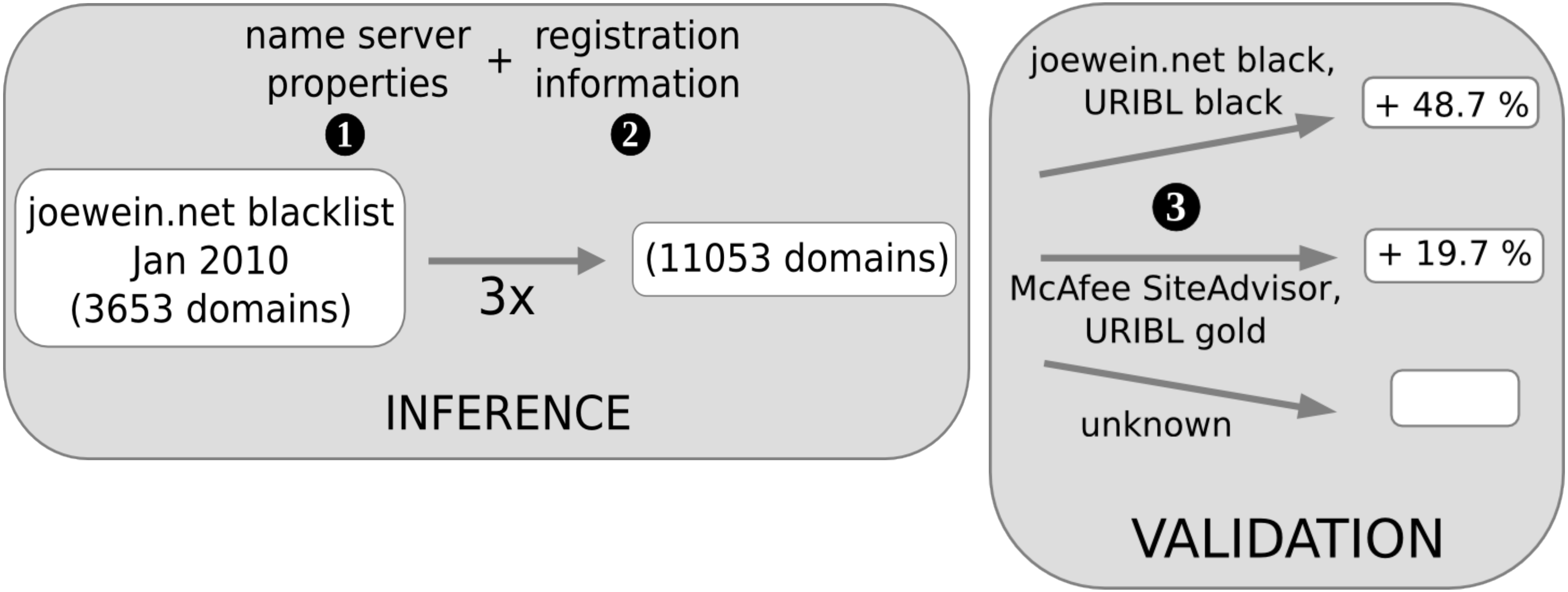
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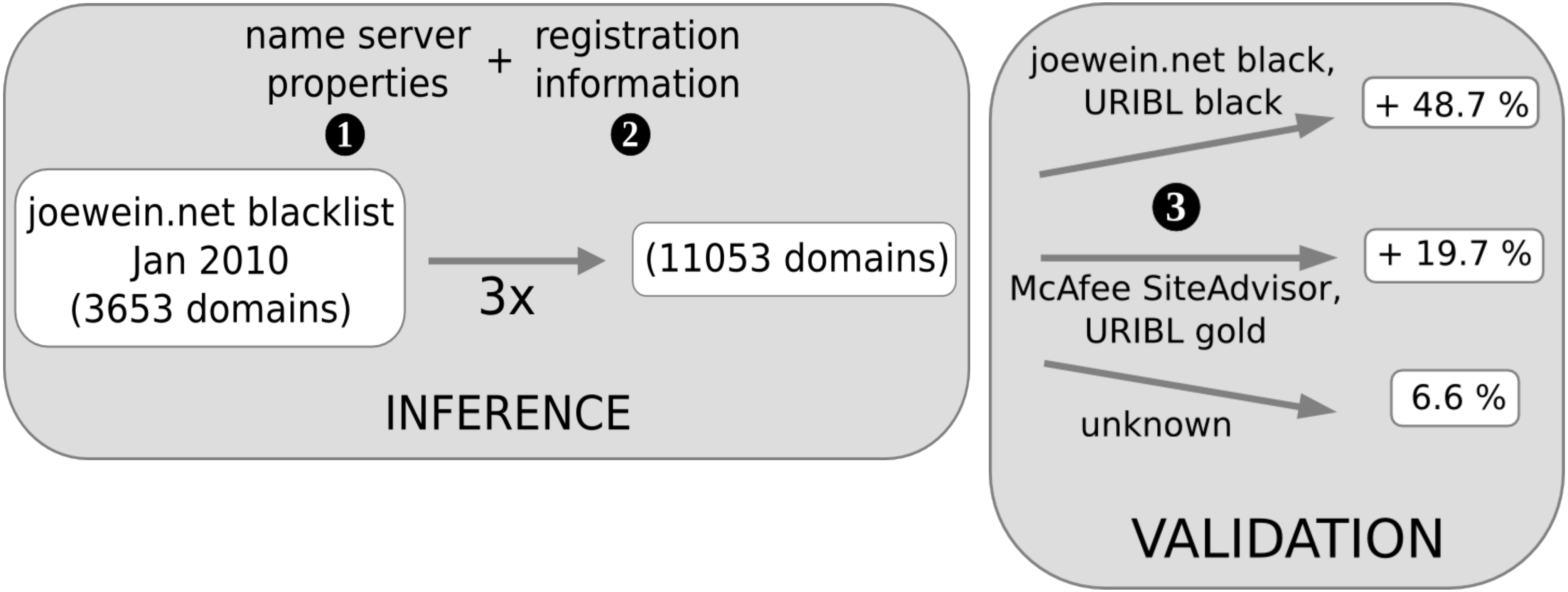

name server properties + registration information

❶ ❷

joewein.net blacklist Jan 2010 (3653 domains)

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(11053 domains)

INFERENCE

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+ 48.7 %

❸

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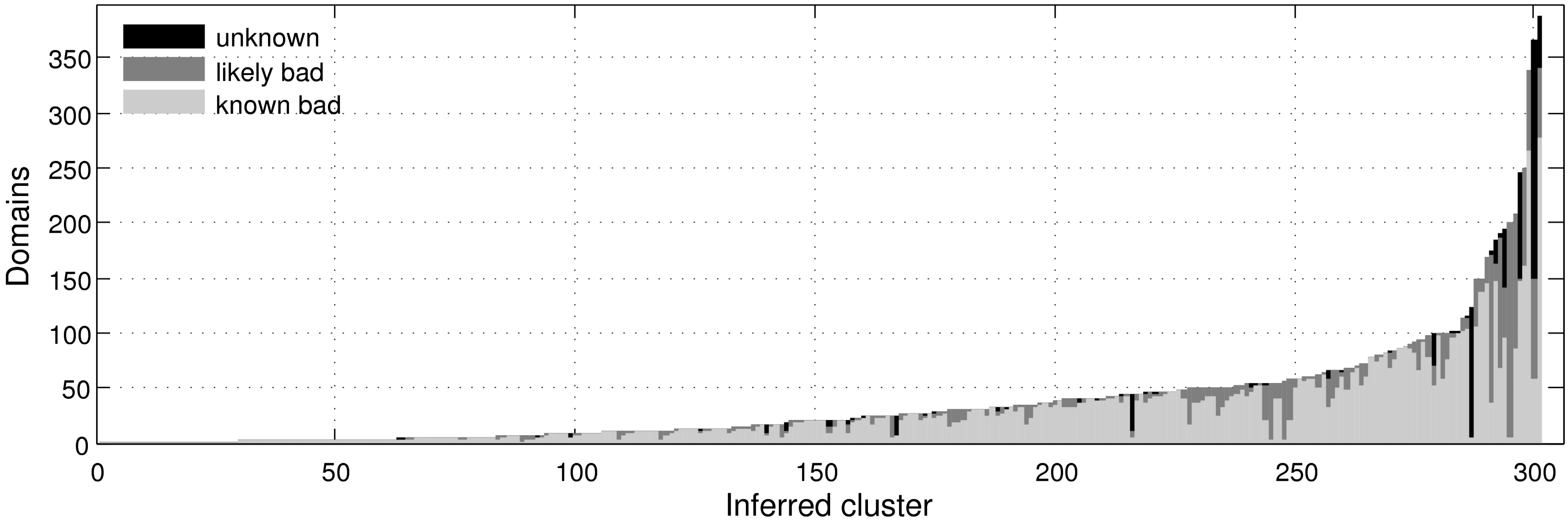
McAfee SiteAdvisor, URIBL gold

unknown

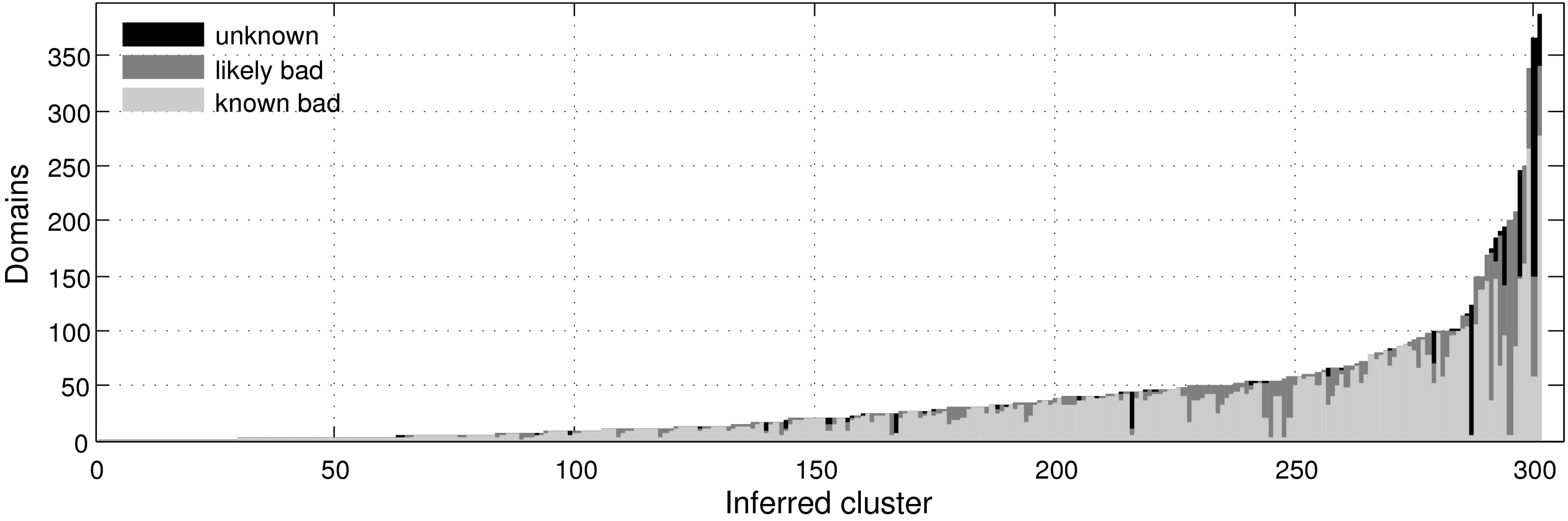
6.6 %

VALIDATION

Prediction accuracy



Prediction accuracy



- good true positive rate, only few false positives
- # of false positives vary across clusters
  - 84% of clusters have no potential FPs (unknown)

A note on false positives

- some other clusters (example: 123 domains, 119 FP)
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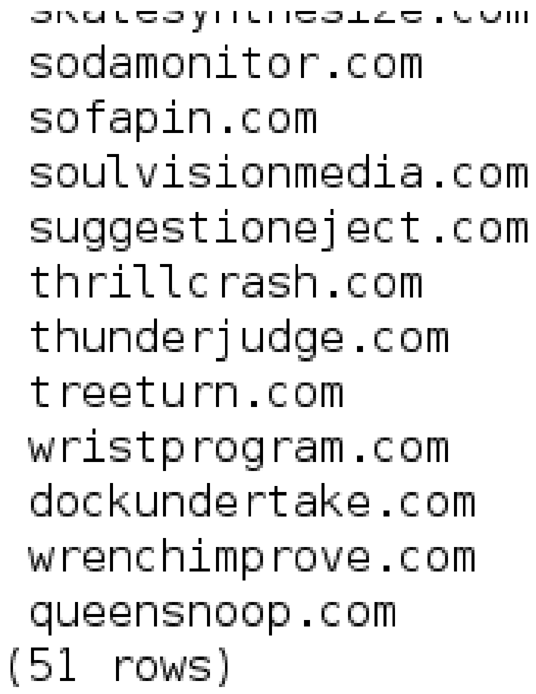

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 skatesynthesize.com
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 soulvisionmedia.com
 suggestioneject.com
 thrillcrash.com
 thunderjudge.com
 treeturn.com
 wristprogram.com
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 wrenchimprove.com
 queensnoop.com
(51 rows)
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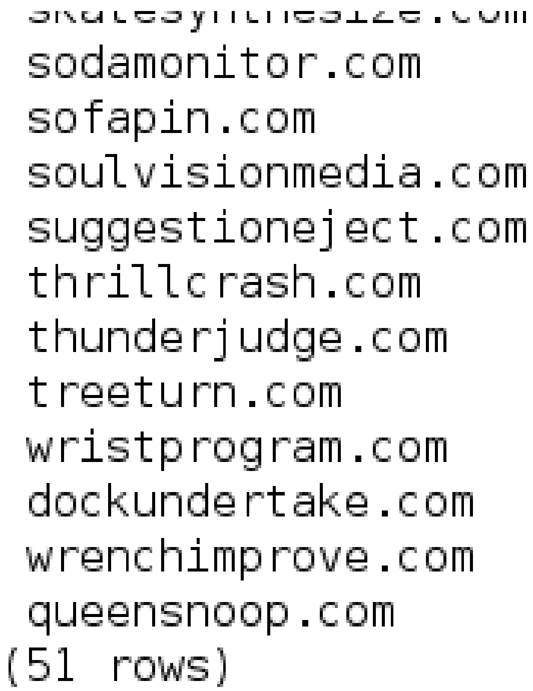

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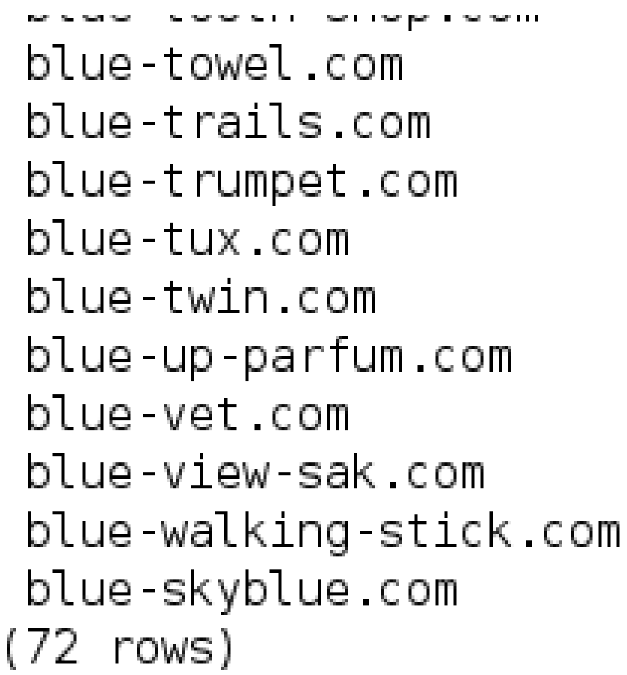

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 blue-tux.com
 blue-twin.com
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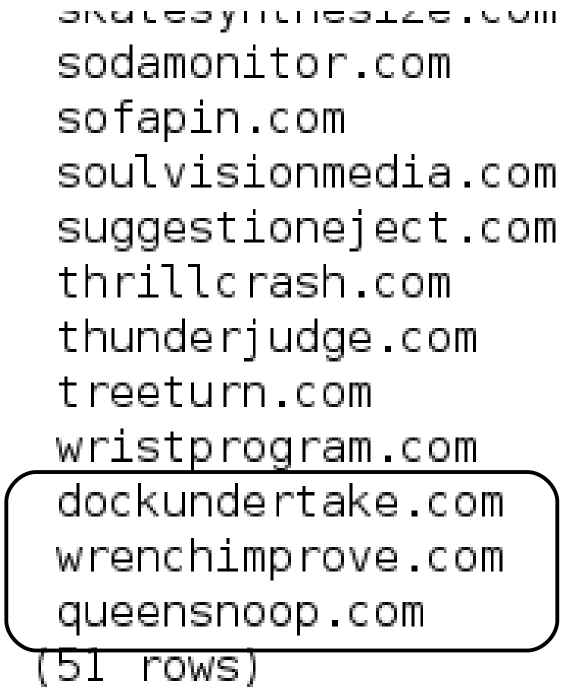

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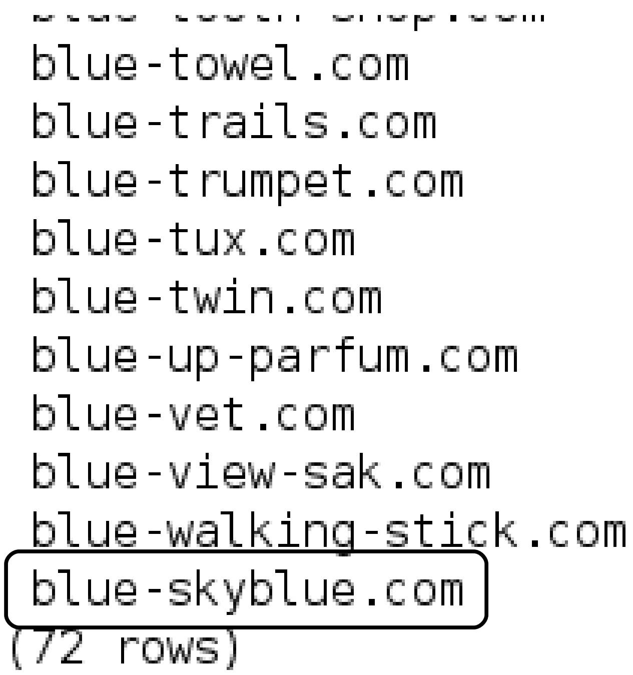

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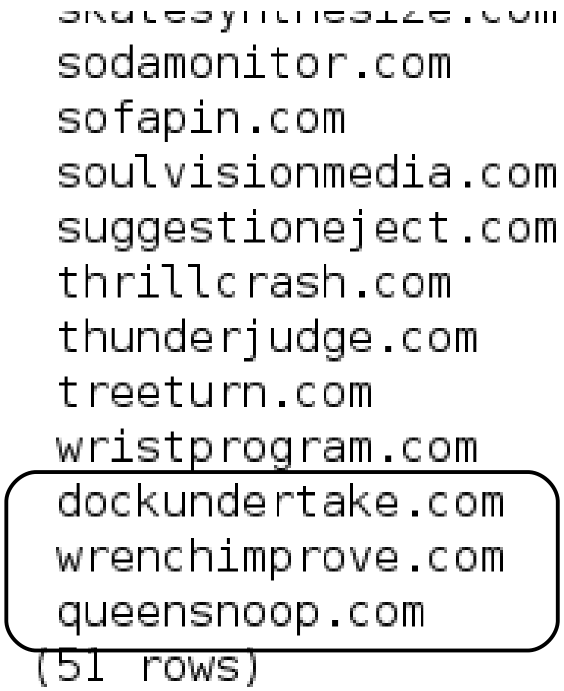

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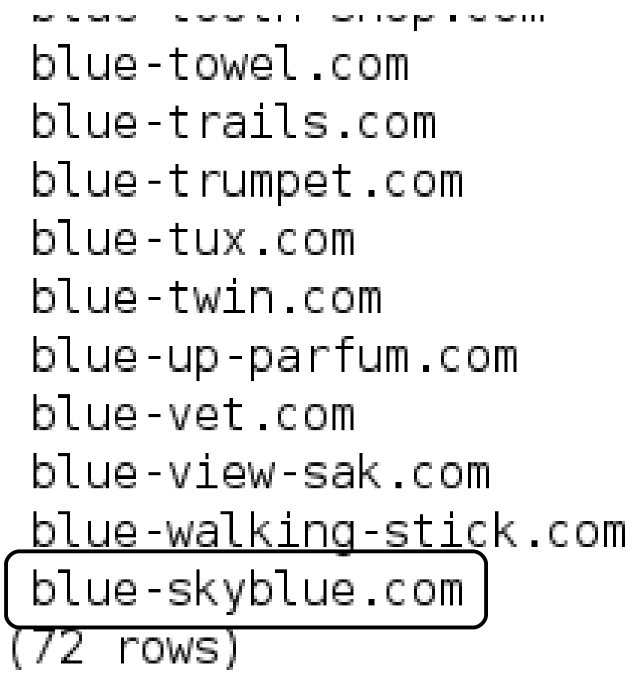

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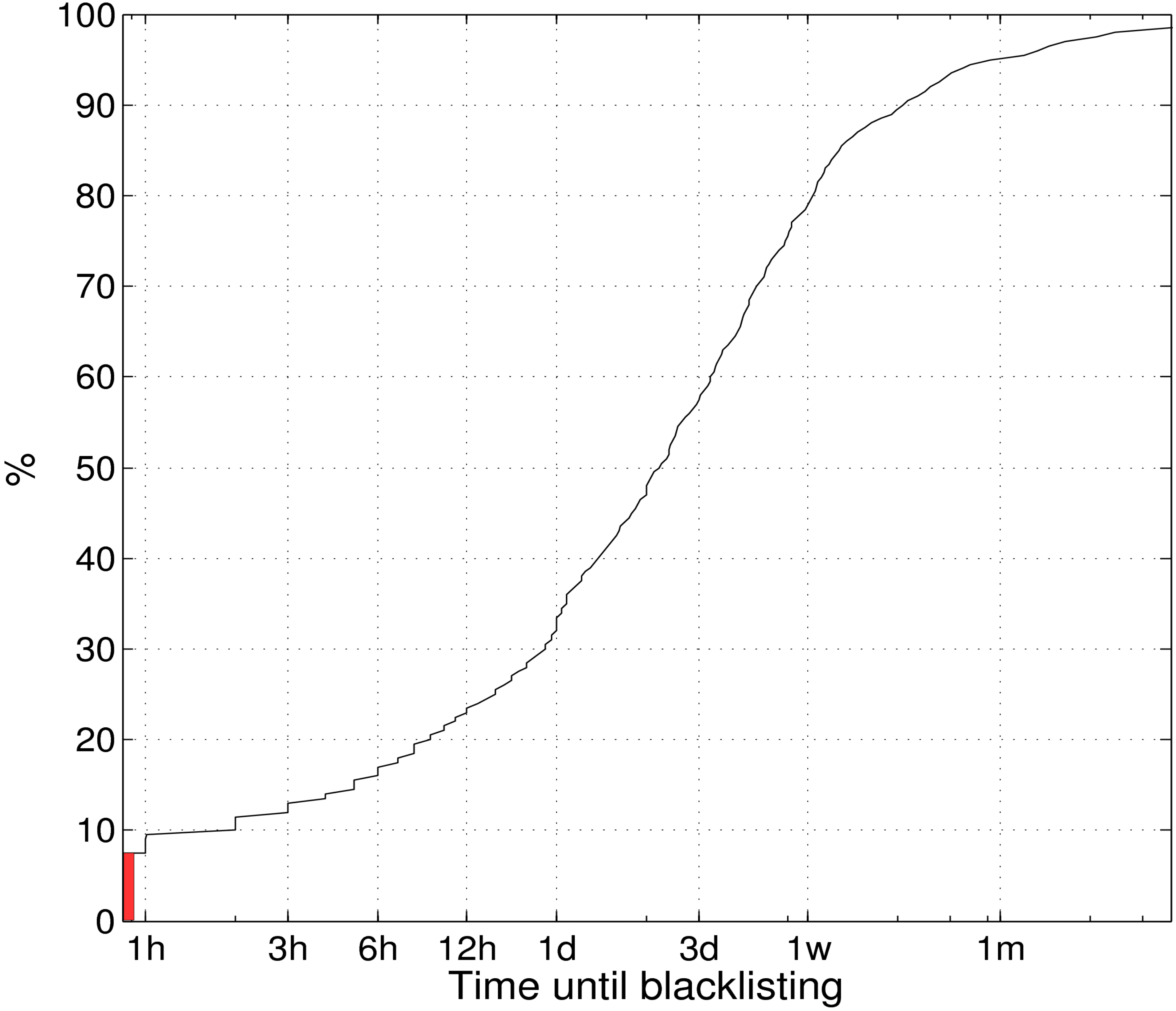
- large cluster: 1746 domains
  - part of a set of 80k domains
  - registered under a single name in Albania in Jan and Feb 2010

Time to blacklisting



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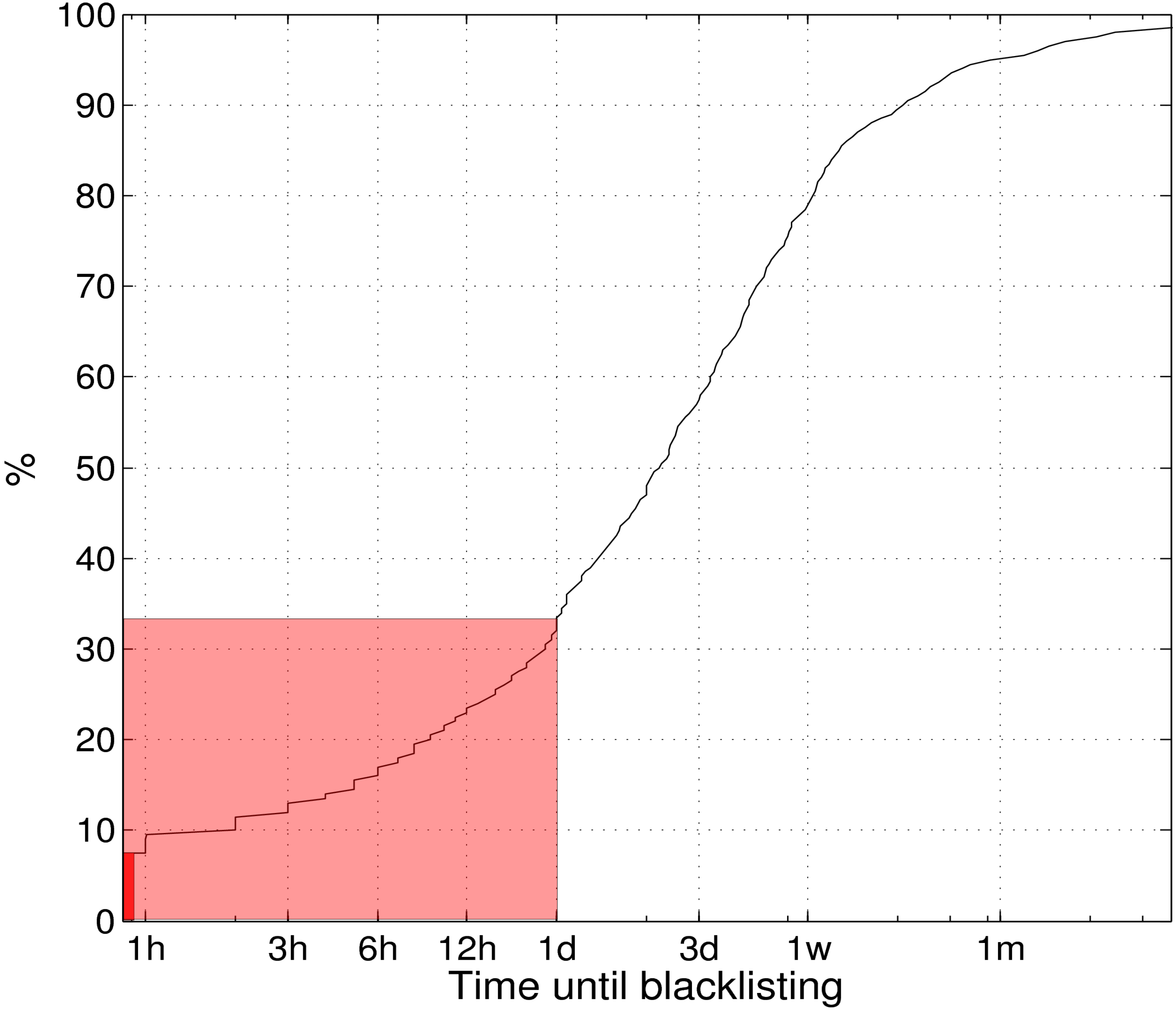

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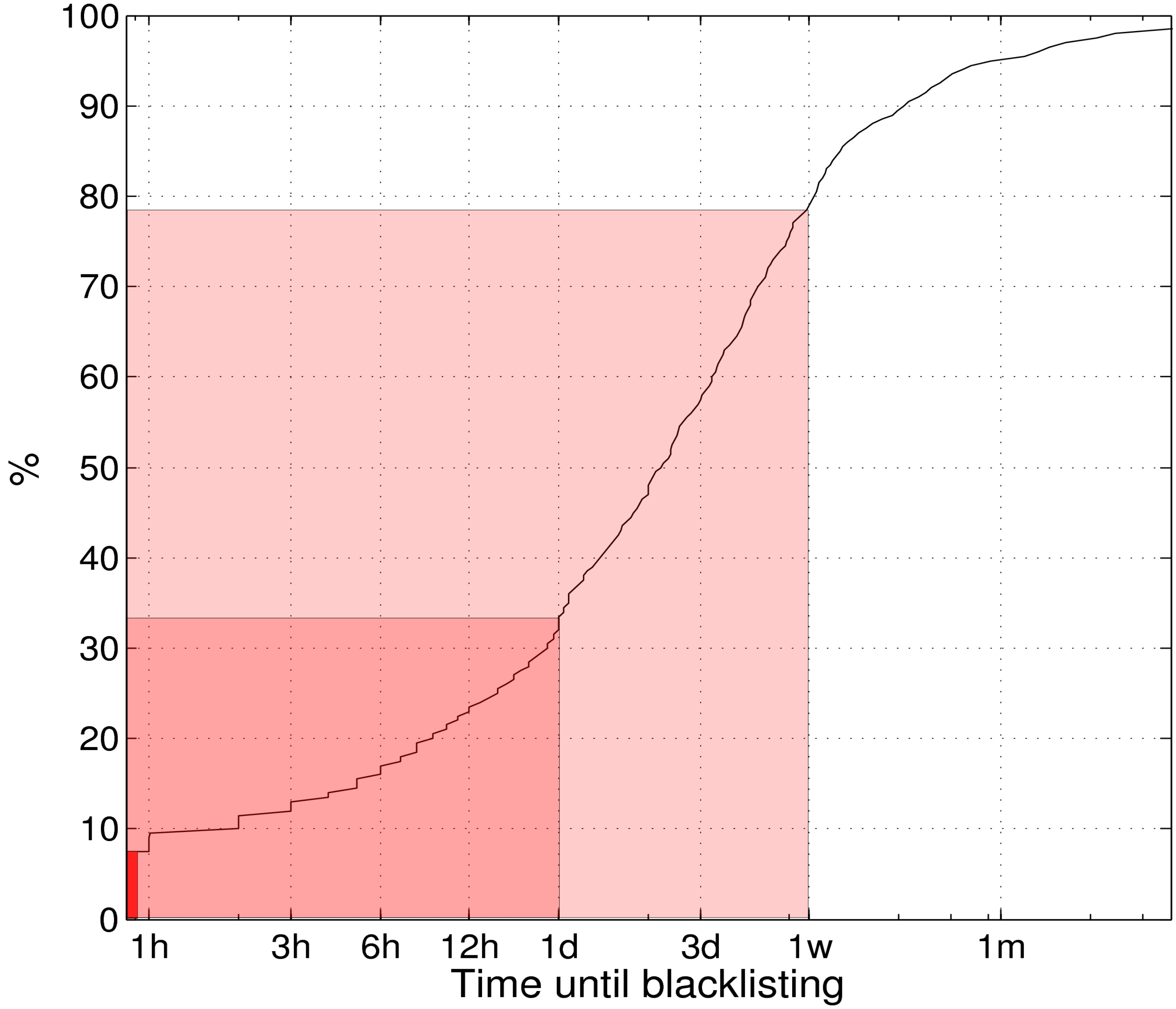

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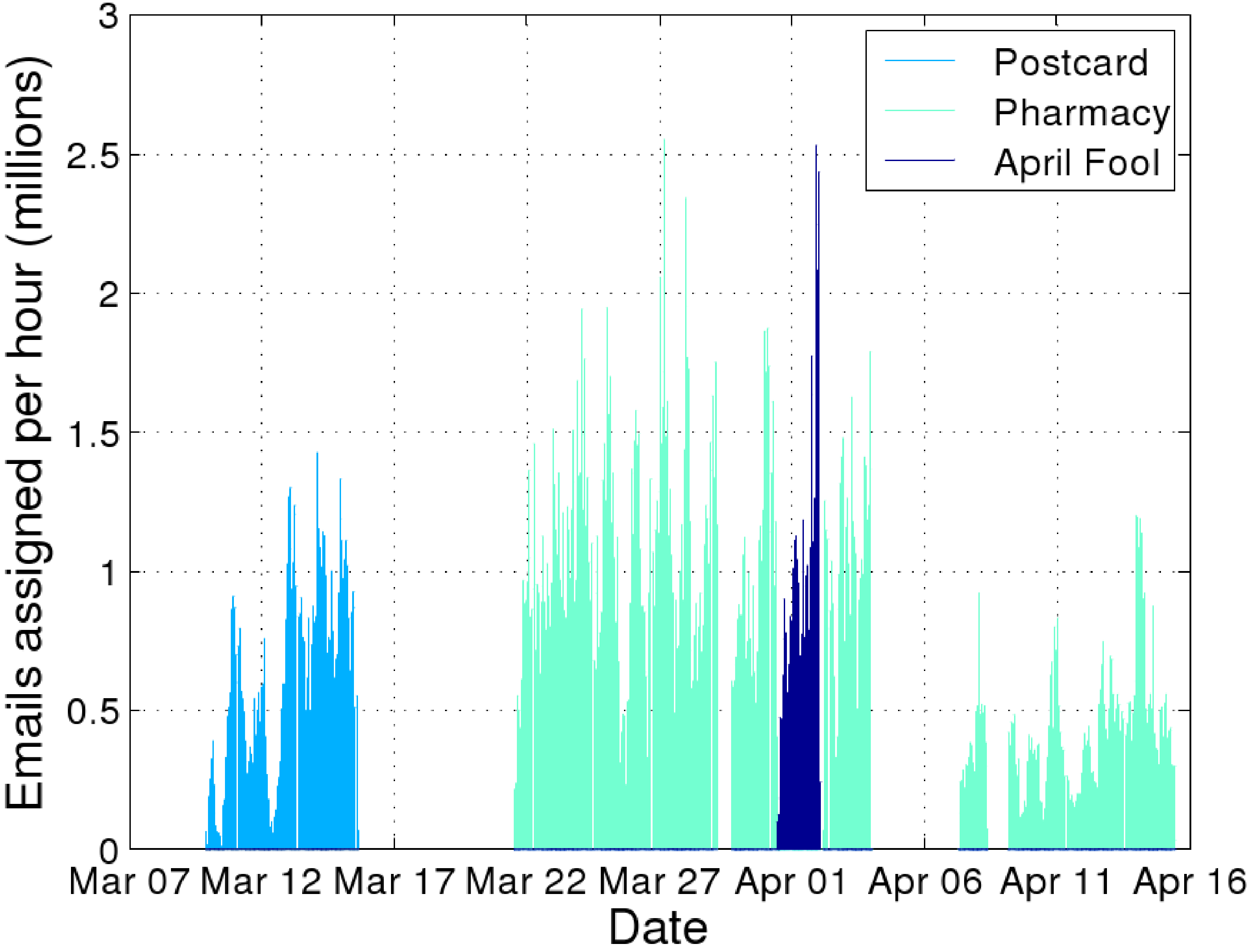
early response to spam

Spam and click volumes



Kanich et al., “Spamalytics: An empirical analysis of spam marketing conversion” CCS 2008
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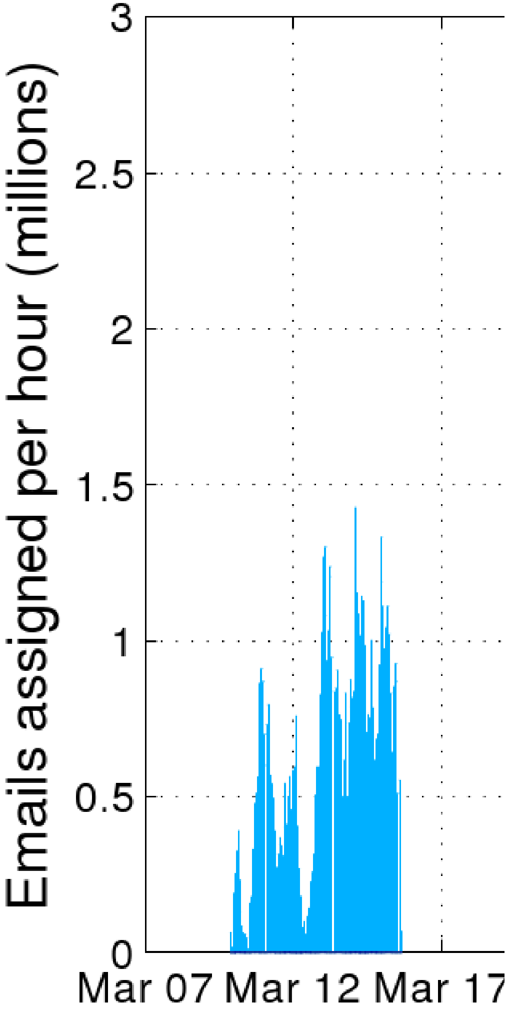

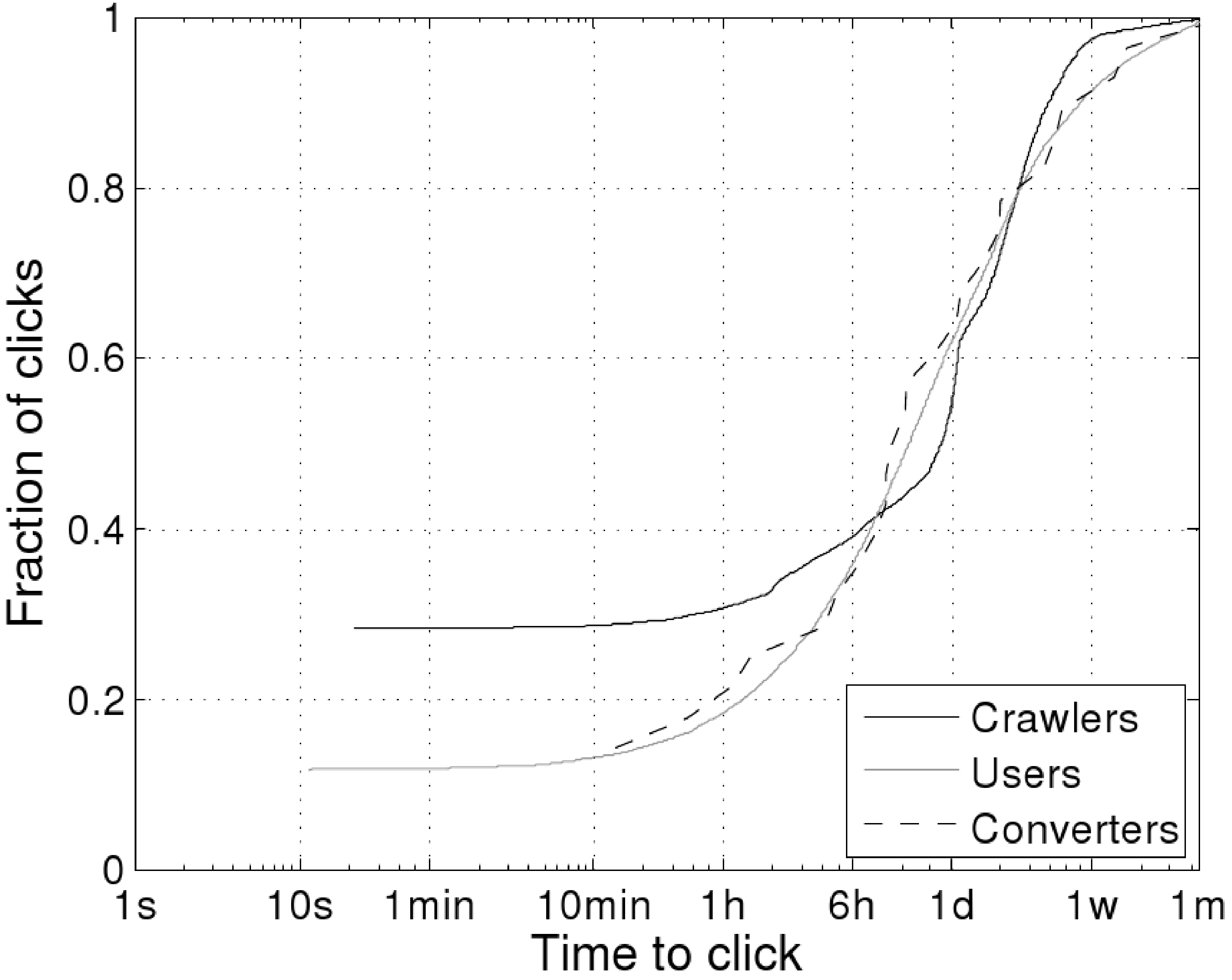

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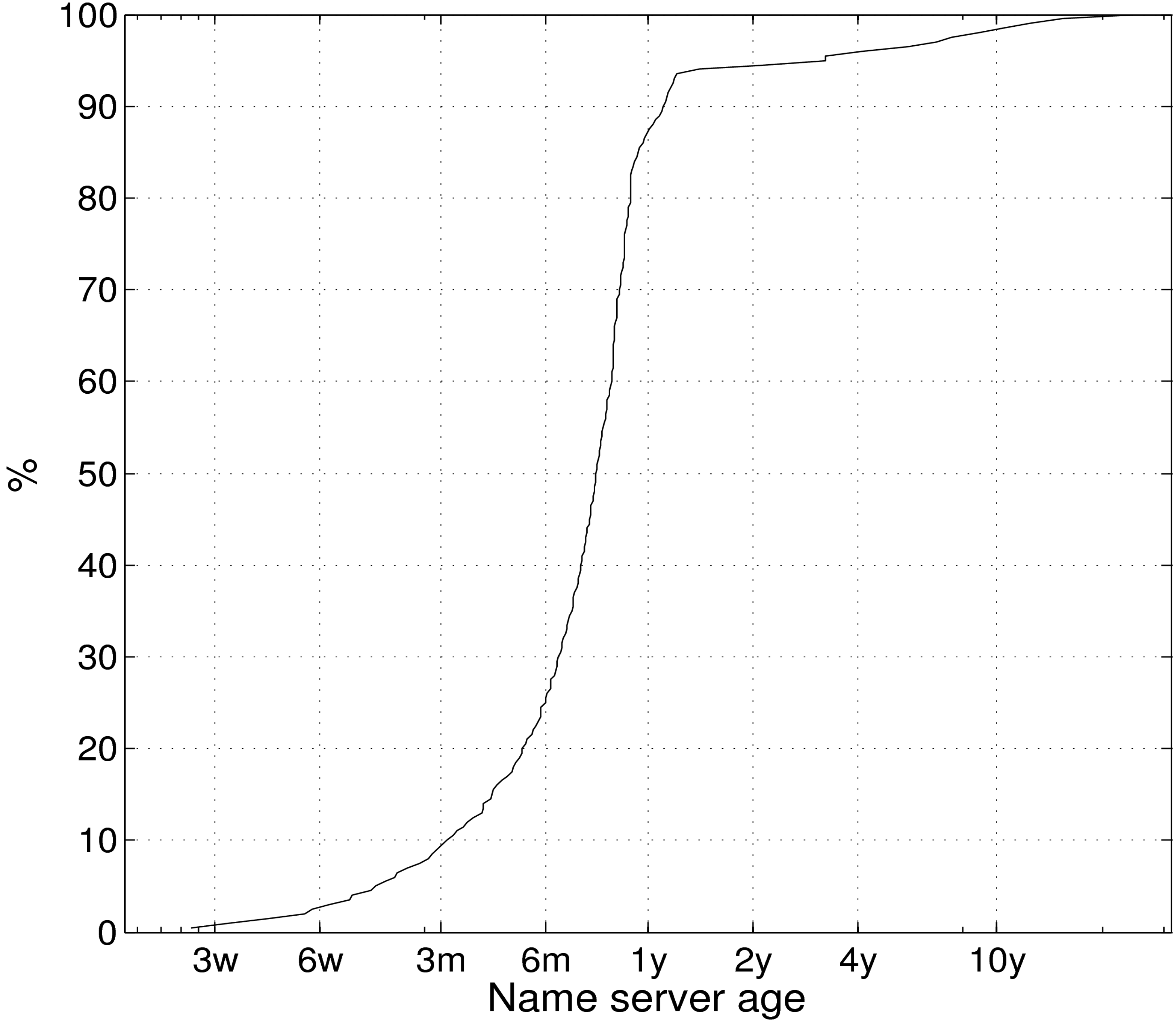
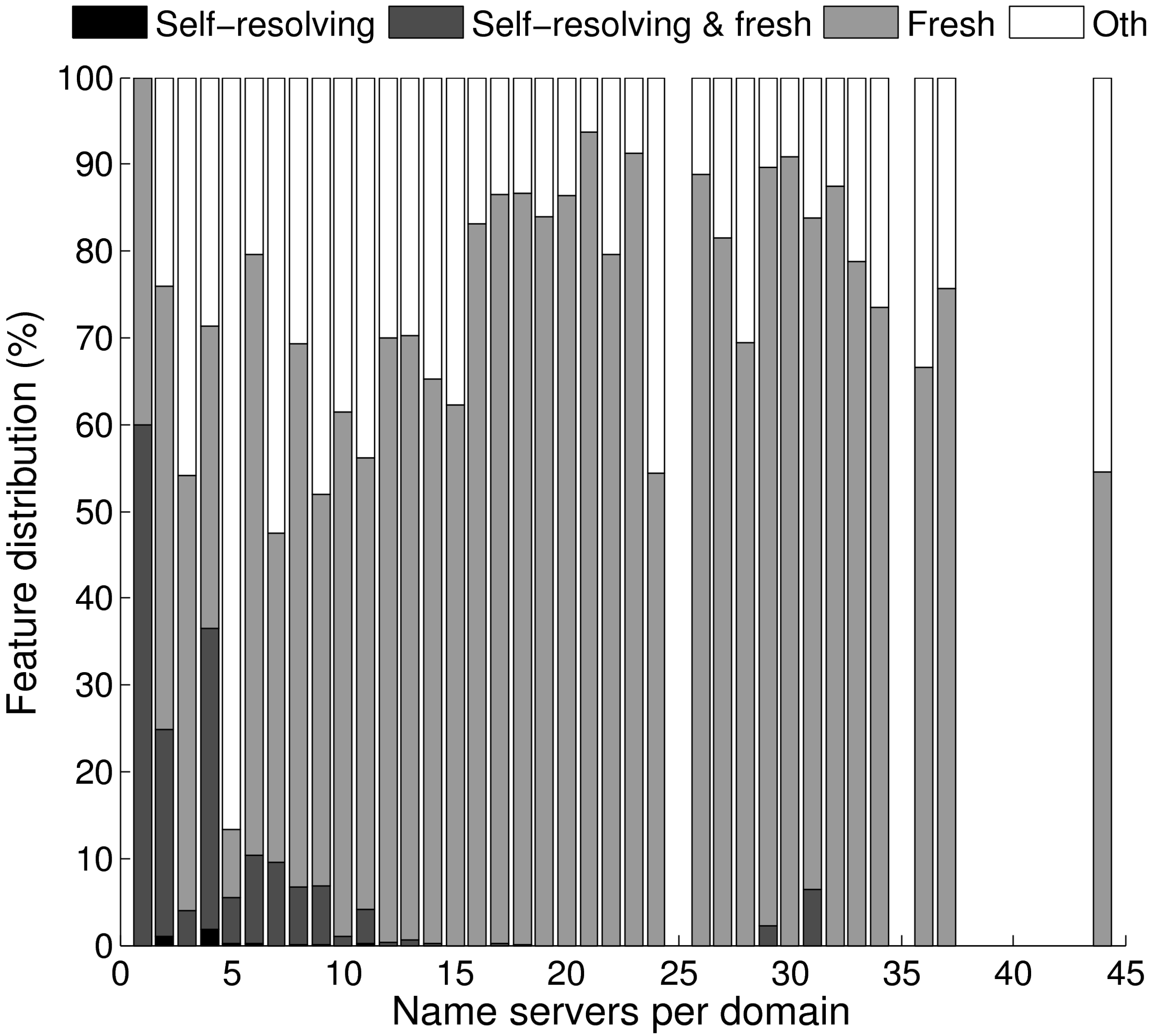
Name server ages

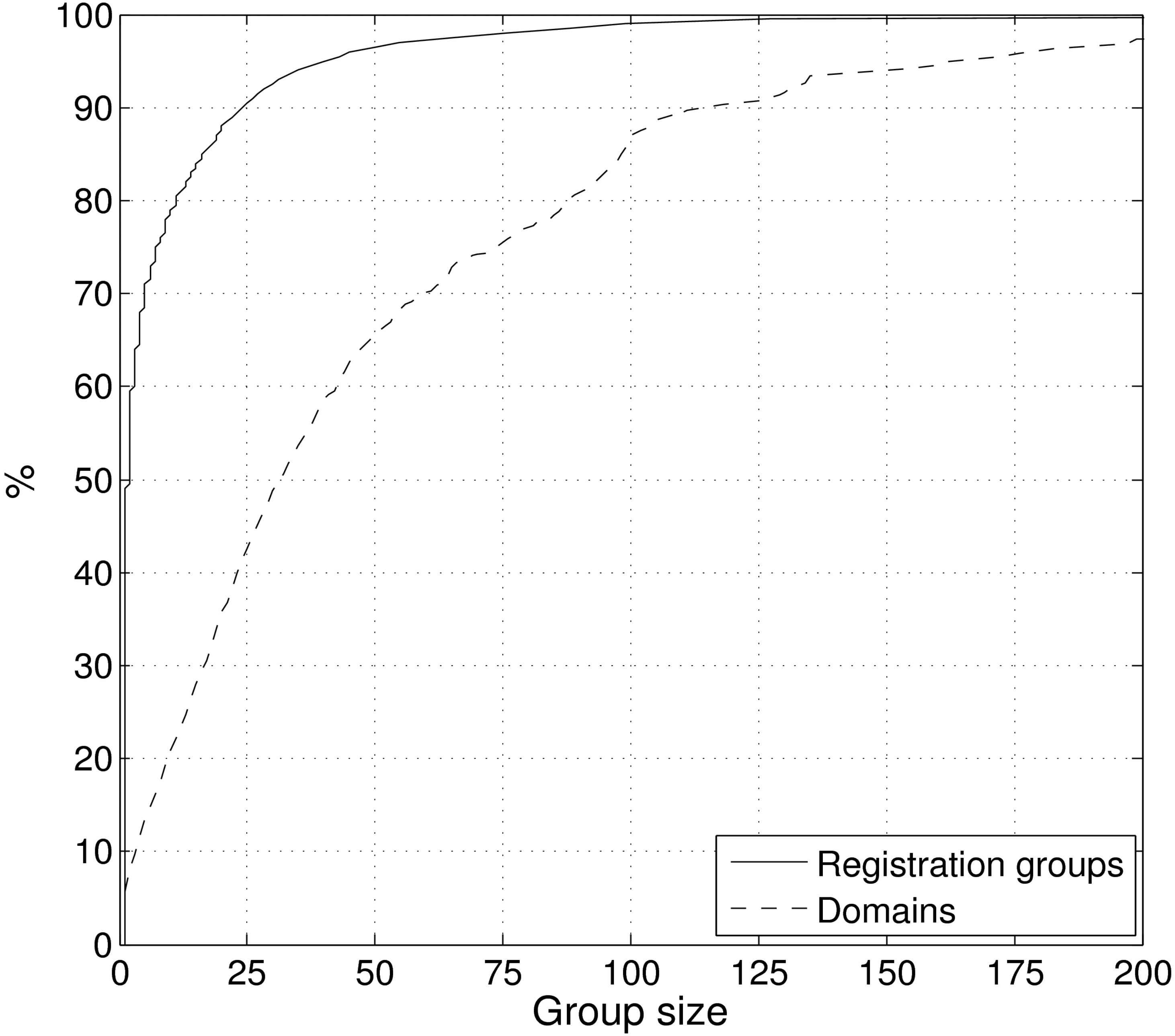


NS features

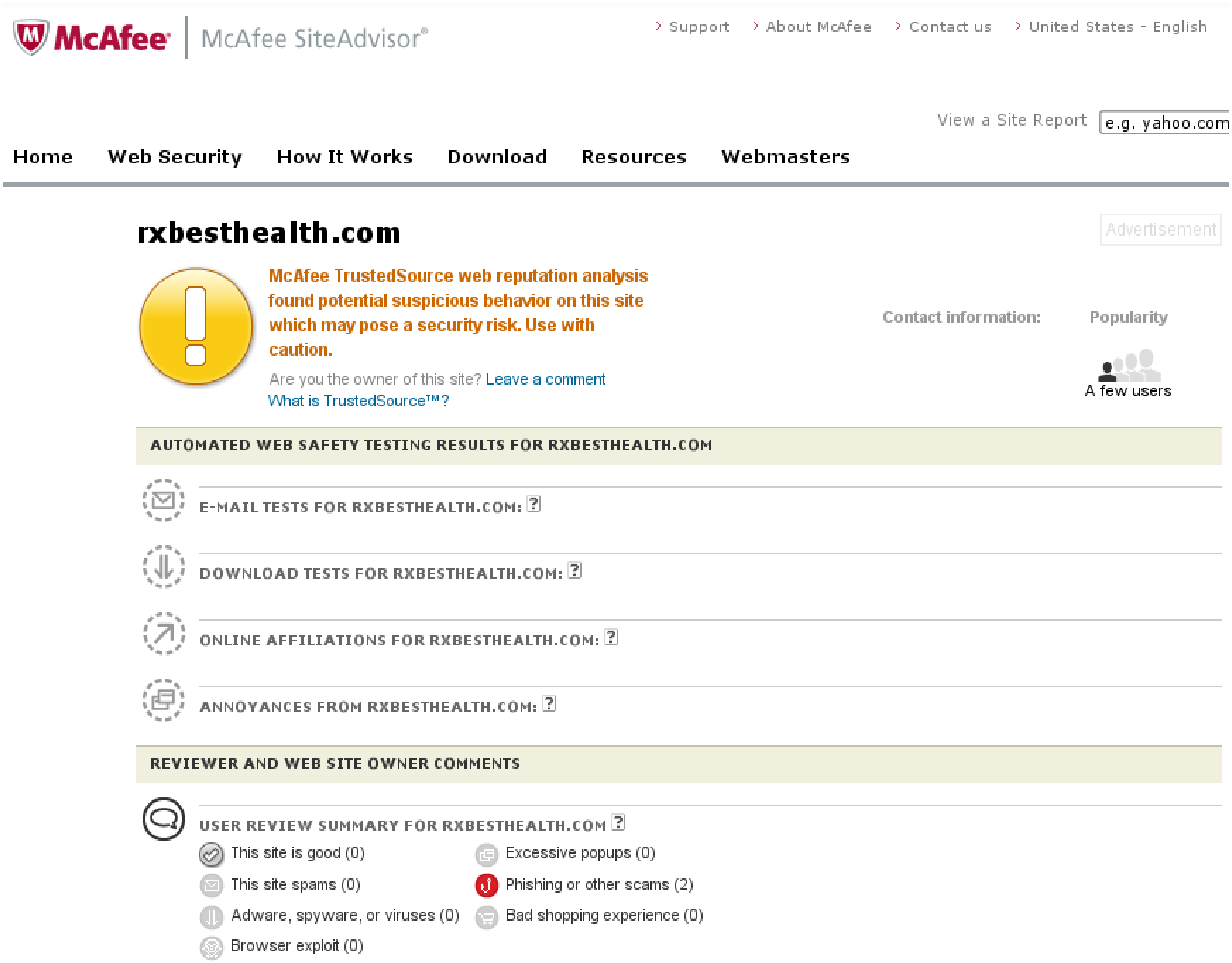
- 82.2% of domains encounter fresh name servers



Registration clusters



McAfee SiteAdvisor



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Contact information:

Popularity

A few users

AUTOMATED WEB SAFETY TESTING RESULTS FOR RXBESTHEALTH.COM

E-MAIL TESTS FOR RXBESTHEALTH.COM: ?

DOWNLOAD TESTS FOR RXBESTHEALTH.COM: ?

ONLINE AFFILIATIONS FOR RXBESTHEALTH.COM: ?

ANNOYANCES FROM RXBESTHEALTH.COM: ?

REVIEWER AND WEB SITE OWNER COMMENTS

USER REVIEW SUMMARY FOR RXBESTHEALTH.COM ?

This site is good (0)	Excessive popups (0)
This site spams (0)	Phishing or other scams (2)
Adware, spyware, or viruses (0)	Bad shopping experience (0)
Browser exploit (0)	