DIALING BACK PHONE
VERIFIED ACCOUNT ABUSE

Kurt Thomas, Dmytro Iatskiv, Elie Bursztein, Tadek Pietraszek, Chris Grier (Databricks), Damon McCoy (GMU)
Keys to the kingdom

One account is all you need

A single username and password gets you into everything Google.
Blackmarket for bulk accounts

- Facebook Accounts
- Yahoo! Accounts
- Twitter Accounts
- Hotmail Accounts
- YouTube Accounts
- Gmail.com
- Tumblr Accounts
- Linked In
- Pinterest Accounts
- Craigslist Accounts
- Tagged Accounts
- Mail.com
Existing protections

- CAPTCHAs
- Email verification
- IP reputation
- Phone verification
Existing protections

**CAPTCHAs**

OCR: 50% accuracy, $30/mo
Human solver: >95% accuracy, $0.70 per 1K

**Email verification**

Mail.ru: $5 per 1K accounts
Yahoo: $8 per 1K accounts

**IP reputation**

Proxies: 15K - 30K IPs for $250/mo

**Phone verification**

?
<table>
<thead>
<tr>
<th>Служба</th>
<th>Количество аккаунтов</th>
<th>Цена за 1К аккаунтов</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail.ru</td>
<td>94369</td>
<td>1K-10K: $5, 10K-20K: $4.5, 20K+: $4</td>
</tr>
<tr>
<td>Gmail.com USA PVA</td>
<td>1710</td>
<td>1K-10K: $100, 10K-20K: $100, 20K+: $100</td>
</tr>
<tr>
<td>Yahoo.com USA PVA</td>
<td>2412</td>
<td>&lt;100: $0.13, 100-1000: $0.13, &gt; 1000: $0.13</td>
</tr>
<tr>
<td>Hotmail.com USA PVA</td>
<td>2045</td>
<td>&lt;100: $0.12, 100-1000: $0.12, &gt; 1000: $0.12</td>
</tr>
<tr>
<td>Facebook.com USA PVA</td>
<td>1914</td>
<td>&lt;100: $0.35, 100-1000: $0.33, &gt; 1000: $0.3</td>
</tr>
<tr>
<td>Gmail.com PVA</td>
<td>481</td>
<td>&lt;100: $0.5, 100-1000: $0.45, &gt; 1000: $0.4</td>
</tr>
<tr>
<td>Gmail.com Manual PVA</td>
<td>677</td>
<td>&lt;100: $0.6, 100-1000: $0.55, &gt; 1000: $0.5</td>
</tr>
</tbody>
</table>

Phone verified accounts (PVA) 10-100x more expensive
Yet we see a steady stream of abusive PVA
Our work

Deep dive into phone verified abuse

- Marketplace for accounts
- Origin of phone numbers
- Registration techniques

Strengthen resource bottleneck for cheap phones
1 ACCOUNT BLACKMARKET
Advertisements for accounts

Web storefronts  Forums  Freelance Listings
Blackmarket as an oracle

Identify 14 merchants, track public pricing

Purchase 2,217 Google PVA from 7 merchants

Price: $85-500
Authenticity: 100% working PVA
Delivery rate: 24-48 hours
Disabled in 1 month: 68%
Prices range $85-500

Price per 1K accounts, multiple merchants
Price reflects quality

- Original value of accounts
- Value lost to disabling
Pricing trends over 8 months

Prices over $150 remain stable

Does price reflect failure in defenses?

30-40% drop in price of Google PVA
PHONE ORIGIN
Datasets

Google PVA, disabled for abuse: **300,000**

Purchases reveal sample is representative

For each account:

Associated carrier, country information
Geolocation of signup IP
CAPTCHA solution attempts
Phone country of origin

Top origins

<table>
<thead>
<tr>
<th>Country</th>
<th>Weekly % of Abusive PVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>27%</td>
</tr>
<tr>
<td>India</td>
<td>22%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>12%</td>
</tr>
<tr>
<td>Nigeria</td>
<td>4%</td>
</tr>
<tr>
<td>South Africa</td>
<td>4%</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>4%</td>
</tr>
</tbody>
</table>
## VOIP largest abuse source

<table>
<thead>
<tr>
<th>Rank</th>
<th>Carrier</th>
<th>Country</th>
<th>Popularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bandwidth.com</td>
<td>US</td>
<td>19.9%</td>
</tr>
<tr>
<td>2</td>
<td>PT</td>
<td>ID</td>
<td>7.3%</td>
</tr>
<tr>
<td>3</td>
<td>Bharti</td>
<td>IN</td>
<td>5.3%</td>
</tr>
<tr>
<td>4</td>
<td>Vodafone</td>
<td>IN</td>
<td>4.0%</td>
</tr>
<tr>
<td>5</td>
<td>MTN</td>
<td>NG</td>
<td>3.0%</td>
</tr>
<tr>
<td>6</td>
<td>Idea</td>
<td>IN</td>
<td>2.8%</td>
</tr>
<tr>
<td>7</td>
<td>Telekomunikasi</td>
<td>ID</td>
<td>2.2%</td>
</tr>
<tr>
<td>8</td>
<td>Aircel</td>
<td>IN</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

... ... ...

18 Level 3 US 0.86%
19 Cell ZA 0.84%
20 Telengy US 0.81%

24% of PVA verified over VOIP

**Includes:**

- Google Voice
- Pinger
- TextPlus
- Enflick
- GoTextMe
TextMe
Free Texting and Calling

Download

Watch our video and learn more!

We're Hiring

TextNow
Our free app turns any WiFi enabled device into a phone. We also sell a low cost all-IP phone from TextNow.com for those who want to text and call even without WiFi.

Visit TextNow.com
Phone for price of a CAPTCHA

Let's set you up with a new account!

Username: [input field]
Password: [input field]
Confirm Password: [input field]
Email: [input field] Not Verified

I agree to the Terms of Service and Privacy Policy or, if a non-U.S. resident, the Data Protection Policy.

Phone Number: 1 (510) 730-2935
Username: [input field]
Name: [input field]
Password: change
Tones: Pinger
Signature: -Sent from Textfree Web
Email Notifications: on/off

cancel create
Strategy in practice [now defunct]

Free SMS Service

New phone per CAPTCHA
Strategy in practice [now defunct]

Free SMS Service  ➔ Google Voice

New phone per CAPTCHA  ➔ Claim 5 forwarding numbers
Strategy in practice [now defunct]

Free SMS Service
New phone per CAPTCHA

Google Voice
Claim 5 forwarding numbers

Google Account
Register 5 accounts per phone number

25 accounts per CAPTCHA
60-80% of all disabled PVA between Oct-Jan
Where do non-VOIP phones originate?

Same locations as human CAPTCHA farms. Socio-economic disparity creates an abuse vector.
$140–420 per 1K SIMs
$140–420 per 1K SIMs
Buyers bid on SMS endpoints: ~$0.20/SMS
Sellers list phone numbers, respond with code.
3  REGISTRATION STRATEGIES
How do older protections perform?

- CAPTCHAs
- Email verification
- IP reputation
- Phone verification
CAPTCHA breaking

56% of registrations shown a CAPTCHA

Correctly solved 96% of the time

Indicative of human solvers
Minimizing IP re-use

Restrict IP re-use over all time to < 20 accounts
Frequent phone re-use

Can re-use phone numbers multiple times

< 30% of phone numbers unique
Access to number is short lived

Lifetime < 1hr compared to 1mo for benign
4 DIALING BACK ABUSE
Frequently abused carriers

Over 1,000 abused carriers
Top 10 carriers contribute 50% of abusive PVA
## Carrier reputation

Most VOIP registrations abusive

All other carriers serve predominantly good users

<table>
<thead>
<tr>
<th>Rank</th>
<th>Carrier</th>
<th>Country</th>
<th>% Good</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bandwidth.com</td>
<td>US</td>
<td>41%</td>
</tr>
<tr>
<td>2</td>
<td>PT</td>
<td>ID</td>
<td>91%</td>
</tr>
<tr>
<td>3</td>
<td>Bharti</td>
<td>IN</td>
<td>98%</td>
</tr>
<tr>
<td>4</td>
<td>Vodafone</td>
<td>IN</td>
<td>98%</td>
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<tr>
<td>5</td>
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<td>NG</td>
<td>97%</td>
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<td>IN</td>
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Pushing back on abusive carriers

In January, we took action on carrier abuse:

- Blocked VOIP numbers acquired with CAPTCHA
- Restricted all other known VOIP numbers to single use
- Restricted some Indian, Indonesian telcos to single use
Impact on pricing

Price returns back to pre-VOIP levels
How did merchants react?

In April, purchase a new set of **2,478 PVA**

Only **12%** were Bandwidth.com, compared to **80%** before
Some previously unseen VOIP services
Merchants hit max registration limit

Need finer grain phone reputation signals
Summary

- Thriving account black market
- Use purchasing as an oracle into criminal capabilities
- Use pricing as an early warning of failing defenses
- Phone verification requires reputation support
THANKS!

kurtthomas@google.com