Tracking the Use of Leaked Consumer Data

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What Happens to Leaked Credentials?

Research question:
When consumer credentials are made public, does anyone use them?

Goal:
Design and conduct a study that tracks the attempted use of stolen consumer credentials
Study of Credential Use

1. Create ~100 consumer accounts
2. Post account data publicly
3. Track use of data
Fake Customer Data

1. Name
2. Address
3. Phone number
4. Email address
5. Password
6. Payment mechanism
   • Credit card number
   • Online payment account
   • Bitcoin wallet
# Posting of Fake Customer Data

<table>
<thead>
<tr>
<th>APRIL</th>
<th>MAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 18 19 20 21 22 23 24 25 26 27 28 29 30</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18</td>
</tr>
<tr>
<td>Posting 1 on paste site</td>
<td>Posting 2 on paste site</td>
</tr>
</tbody>
</table>

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Posting One vs. Posting Two

- Same data, posted twice
- Different format and time of day

Posting 1: ~100 views

Posting 2: ~550 views
(Picked up by Twitter bot)
Monitoring of Data Usage

• Monitored for about three weeks
  – Week before Posting 1 (Pre-study control)
  – Week after Posting 1 (Week 1)
  – Week after Posting 2 (Week 2)

• Logged
  – Email account access attempts
  – Payment account access attempts
  – Credit card attempted charges
  – Texts and calls received by phone numbers
Time Before First Unauthorized Access Attempt

Posting 1

1.5 hours

Posting 2

9 minutes
Total Unauthorized Access Attempts

Number of Attempts

- Pre-Study: 1
- Week 1: 119
- Week 2: 1108
Unauthorized Access Attempts by Account Type

- Email Services
- Credit Card Numbers
- Payment Accounts

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Account Activity

Posting 1

Posting 2

- Email Services
- Credit Card Numbers
- Payment Accounts
Email Account Access Attempts by Week

- Pre-Study: 1 attempt
- Week 1: 47 attempts
- Week 2: 466 attempts
Email Access Attempts by Unique IP Addresses

(Likely underestimates access attempts)
Geolocation of IPs Used in Access Attempts

*IP addresses identified as suspicious by a freely available service
Credit Card Purchase Attempts

• Max: $2,697.75, at a clothing website
• Total amount within two weeks: $12,825.53
  – Includes multiple payment attempts
  – Includes preauthorization charges
• Noteworthy attempts:
  – Online dating service
  – Pizza place
  – Hotels
Amount Attempted per Charge

<table>
<thead>
<tr>
<th>Number of Charges</th>
<th>Identified preauthorizations</th>
<th>Charges</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 -$1</td>
<td>137</td>
<td></td>
</tr>
<tr>
<td>$1 -$5</td>
<td>119</td>
<td></td>
</tr>
<tr>
<td>$5 -$10</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>$10 -$20</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>$20 -$30</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>$30 -$50</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>$50 -$100</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>$100 -$1k</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>$1k -$2k</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Over $2k</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

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Charge by Category

- Retailers: 164
- Unknown: 79
- Gaming: 59
- Entertainment: 39
- E-payment service: 36
- Online tools: 23
- Food: 12
- Gift card: 9
- Charity: 8
- Travel: 7
- Mobile phone: 3
- Insurance: 1
- Investment: 1
Additional Thoughts

• If you post it, they will use it
• Paste sites should be monitored by email and payment service providers
• Two factor authentication provides some protection against stolen credentials
• Merchants should consider refusing seriatim purchase attempts
Future work

• Analysis of email spam, text spam, and phone calls received by fake consumer email accounts

• Posting of consumer data in other ways that might attract different types of thieves

Have relevant research?

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