Non-Political Security Learnings from the Mueller Report
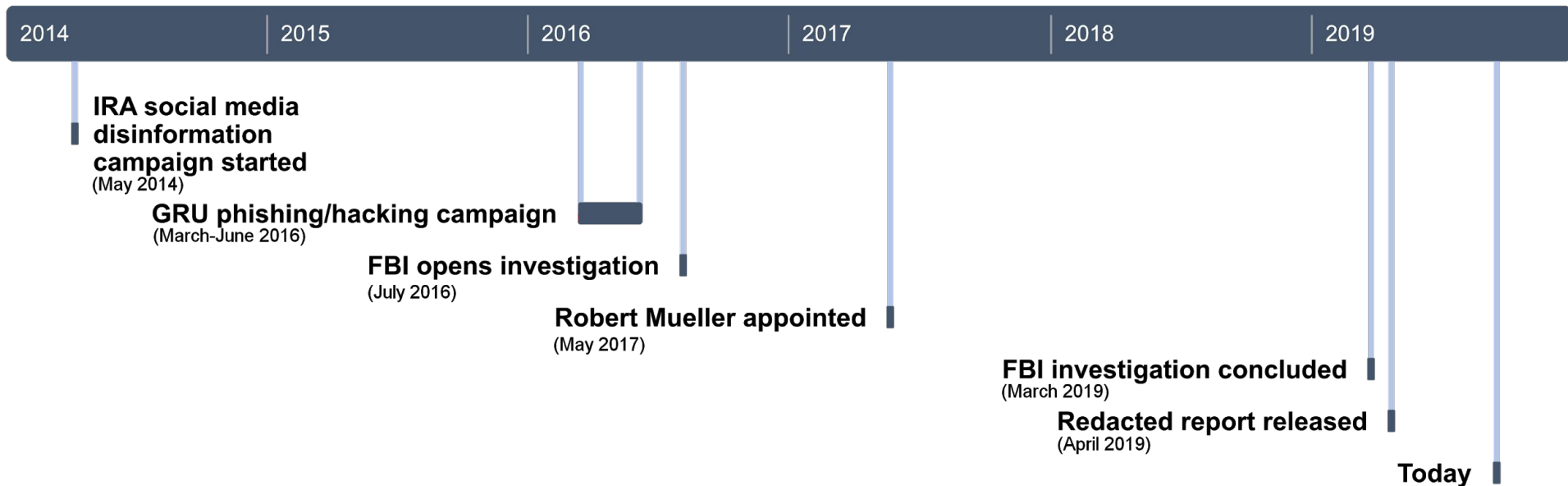
Arkadiy Tetelman (@arkadiyt)

Agenda

- **Background**

- **Blue Team Learnings**

- **Questions**

About Me

- **Arkadiy Tetelman (@arkadiyt)**

- **Head of Security at Lob**

- **Previously appsec at Airbnb, Twitter**

- **Fun fact**

Background

2014	2015	2016	2017	2018	2019

IRA social media disinformation campaign started
(May 2014)

GRU phishing/hacking campaign
(March-June 2016)

FBI opens investigation
(July 2016)

Robert Mueller appointed
(May 2017)

FBI investigation concluded
(March 2019)

Redacted report released
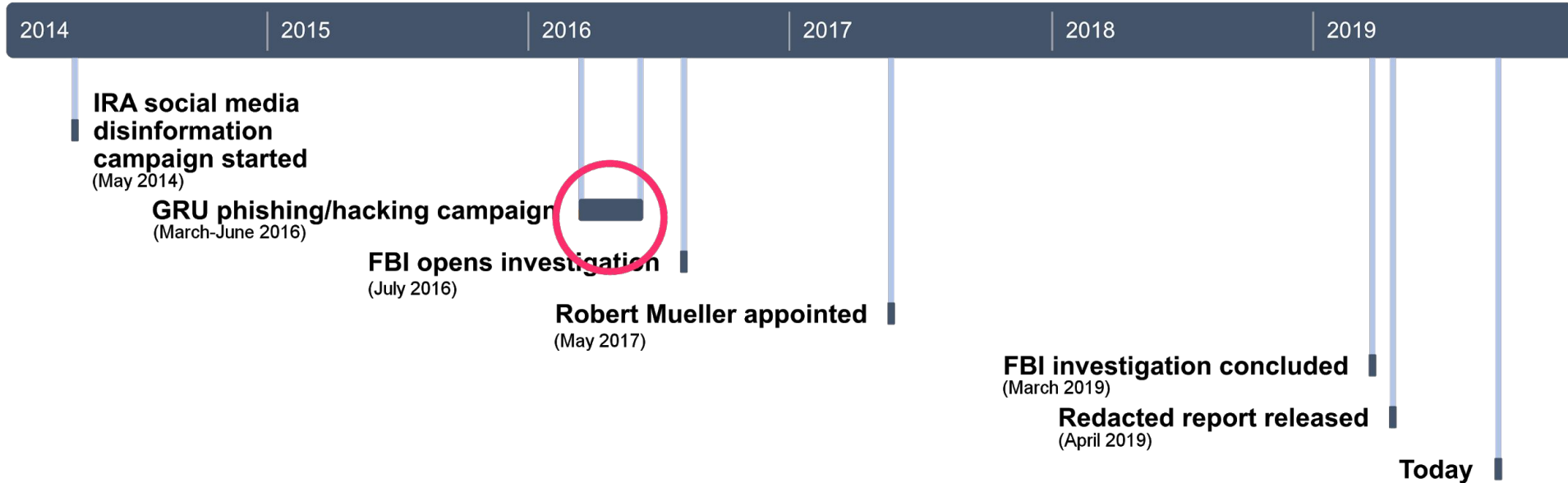(April 2019)

Today

Background

- **2 years 8 months**

- **Employed:**

  - **~22 attorneys & paralegals**

  - **~9 support staff**

- **Worked alongside:**

  - **~40 FBI staff (agents, analysts, etc)**

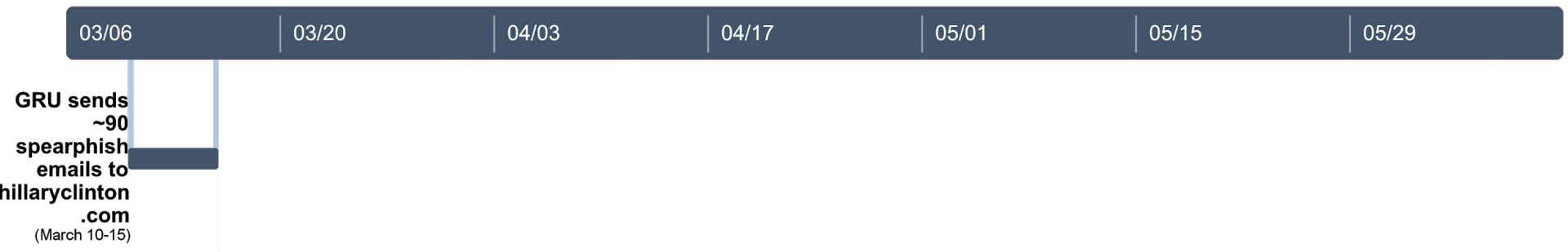- **Estimated cost: $25M**

- **Estimated gain: $48M**

Background

- **Volume 1: Russian interference in the 2016 election**

  - **II. "Active Measures" social media campaign**

  - **III. Hacking/dumping campaign**

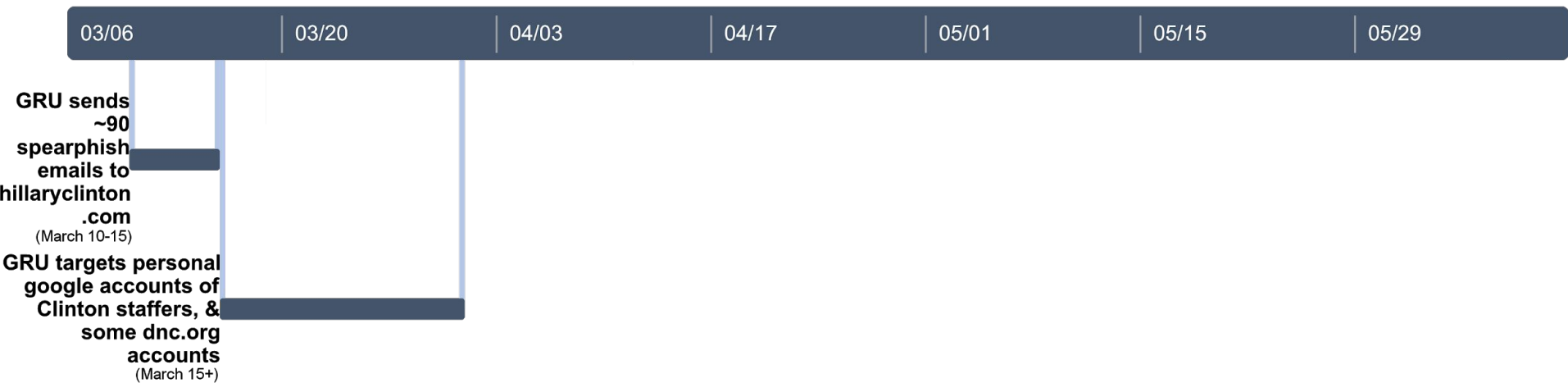- **Volume 2: Administration obstruction of justice**

Blue Team Learnings

Timeline

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GRU sends ~90 spearphish emails to hillaryclinton .com
(March 10-15)

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John Podesta phished
(March 19)

Google

Someone has your password

Hi ███████

Someone just used your password to try to sign in to your Google Account
███████████████████ using an application such as an email client or mobile device.

Details:
Monday, September 19, 2016 12:14 PM (Eastern Daylight Time)
United States*

Google stopped this sign-in attempt, but you should review your recently used devices:

REVIEW YOUR DEVICES NOW

Best,
The Google Accounts team

*The location is approximate and determined by the IP address it was coming from.

This email can't receive replies. For more information, visit the Google Accounts Help Center.

From: Charles Delavan <██████@hillaryclinton.com>
Date: March 19, 2016 at 9:54:05 AM EDT
To: Sara Latham <██████@hillaryclinton.com>, Shane Hable <██████@hillaryclinton.com>
Subject: Re: Someone has your password

Sara,

This is a legitimate email. John needs to change his password immediately, and ensure that two-factor authentication is turned on his account.

He can go to this link: https://myaccount.google.com/security to do both. It is absolutely imperative that this is done ASAP.

Mr. Delavan ... said that his bad advice was a result of a typo: He knew this was a phishing attack, as the campaign was getting dozens of them. He said he had meant to type that it was an "illegitimate" email, an error that he said has plagued him ever since.
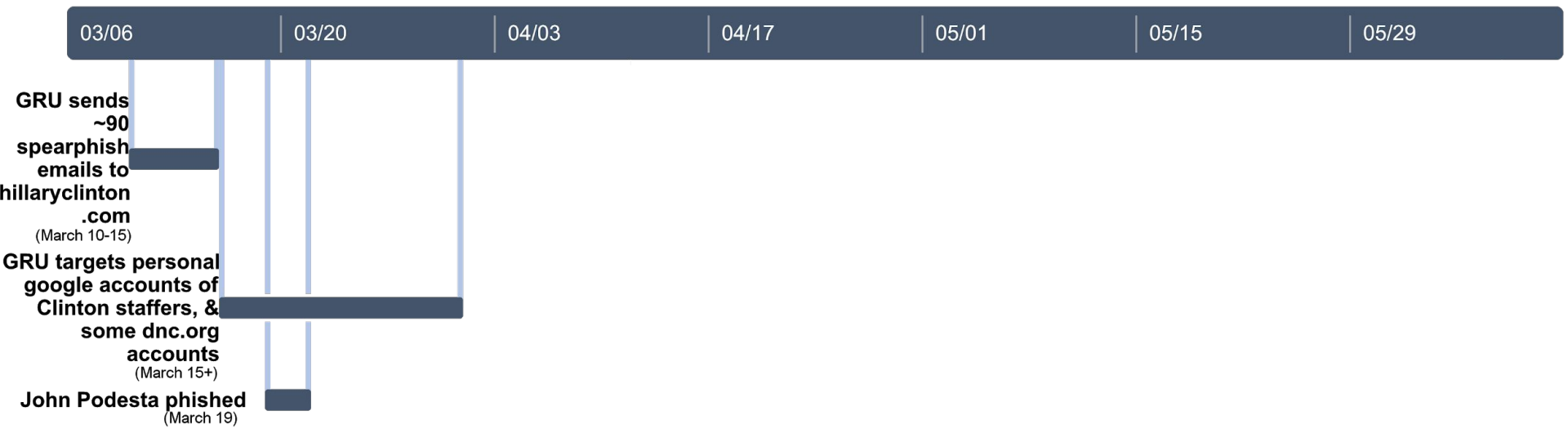
* https://www.nytimes.com/2016/12/13/us/politics/russia-hack-election-dnc.html
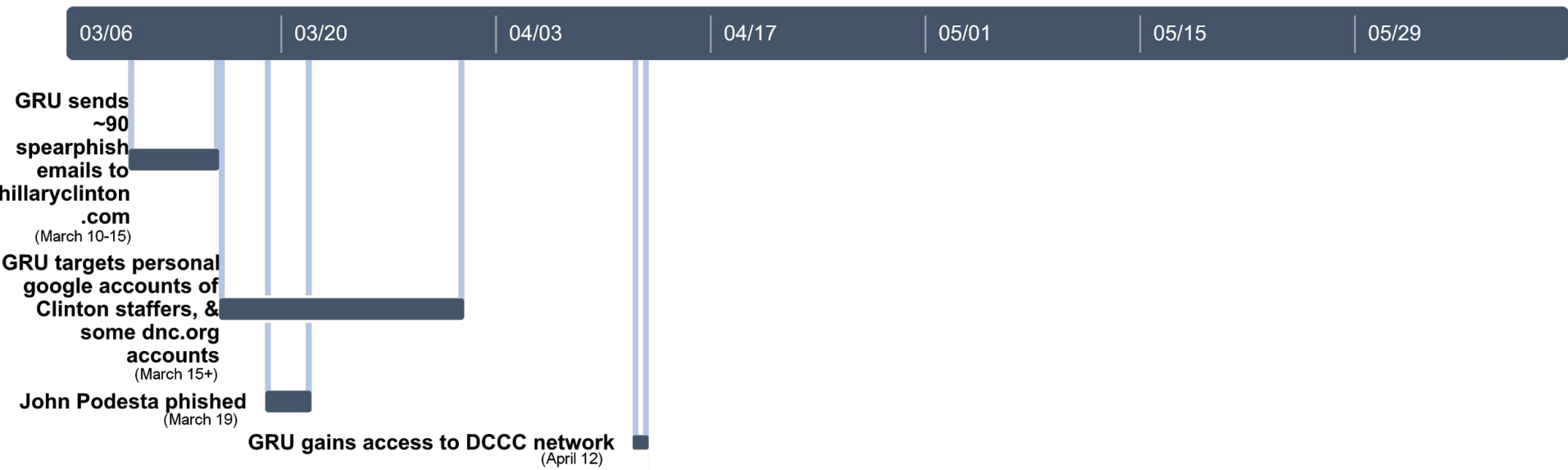
Phished Accounts

- **numerous email accounts of Clinton Campaign employees and volunteers**

- **junior volunteers assigned to the Clinton Campaign's advance team**

- **informal Clinton Campaign advisors**

- **a DNC employee**

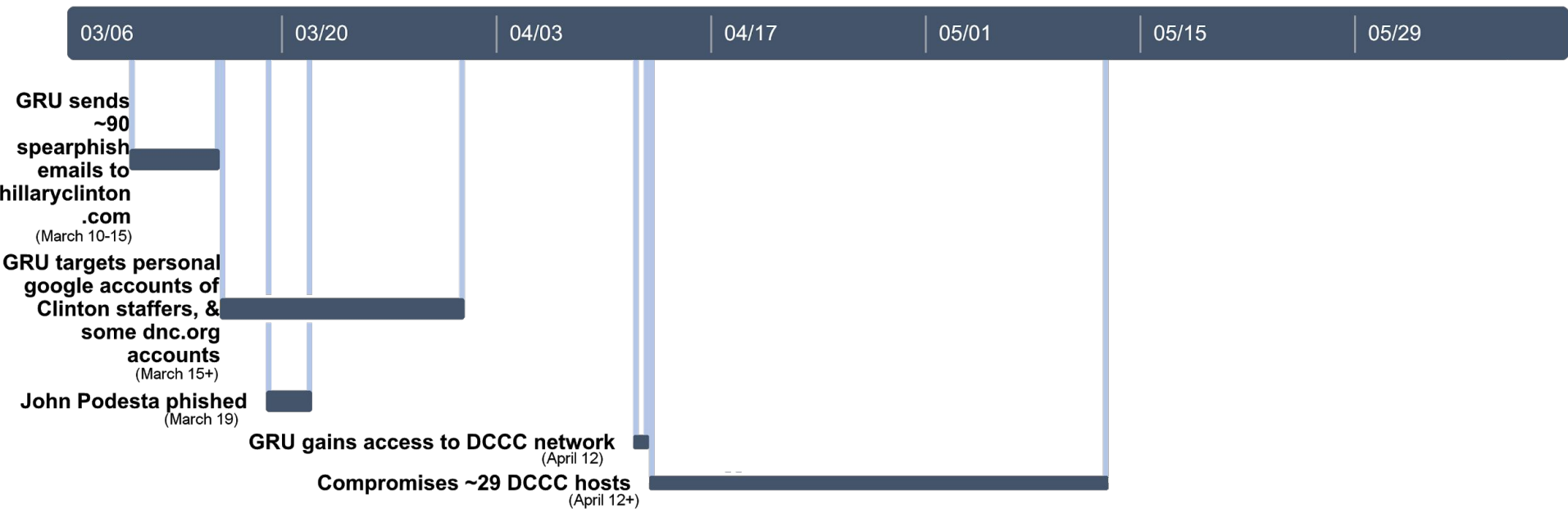- **118 GRU officers stole tens of thousands of emails**

Recommendations

- **Password manager / hardware (U2F, WebAuthn) 2fa tokens**
  - **https://krebsonsecurity.com/2018/07/google-security-keys-neutralized-employee-phishing**
- **Ingest & alert on DNS**
- **Scan incoming emails**
- **Ingest mail audit log events**
- **Phishing exercises?**
- **Assume phishing**

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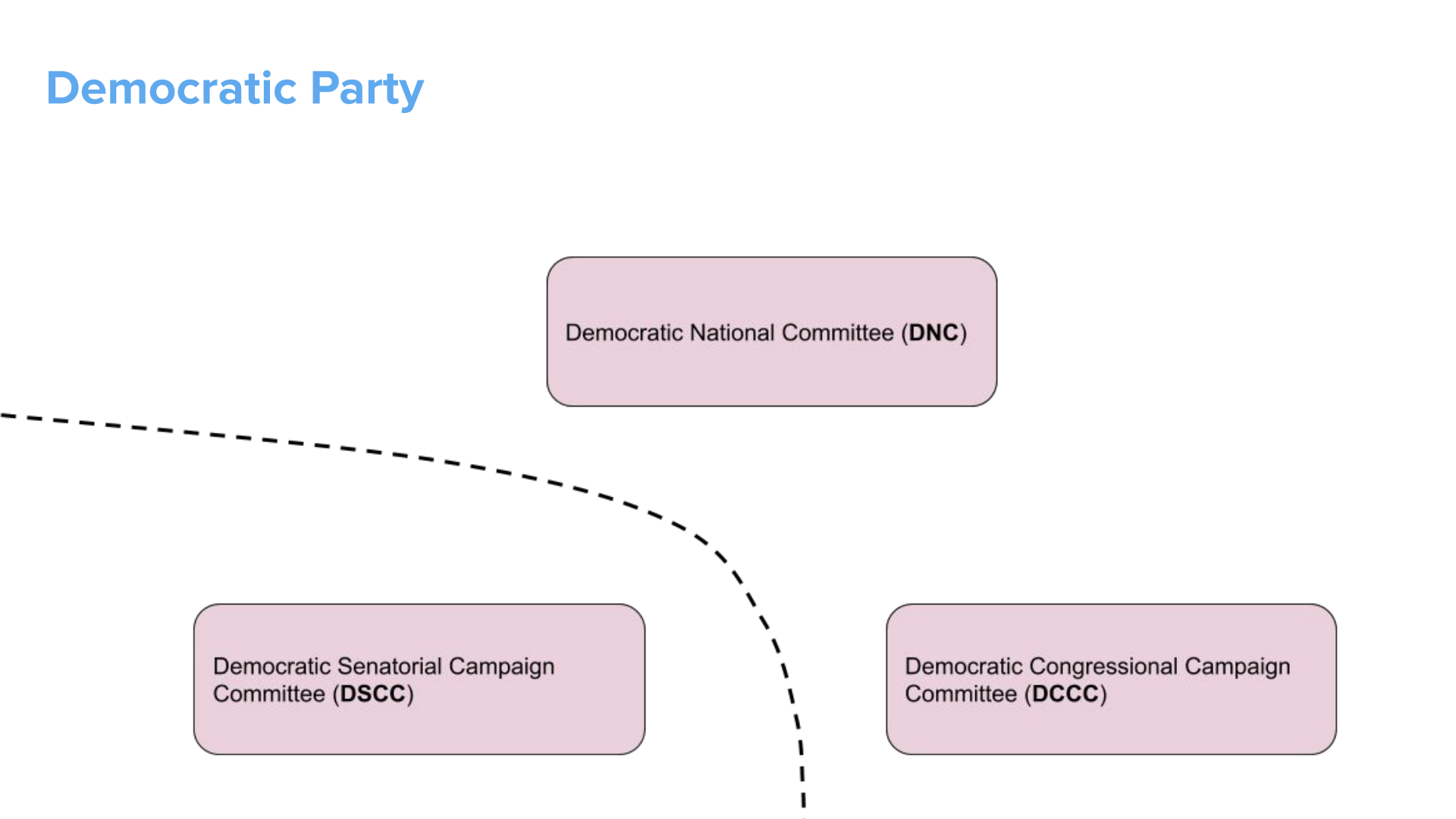(March 19)

GRU gains access to DCCC network
(April 12)

Over the ensuing weeks, the GRU traversed the network, identifying different computers connected to the DCCC network. By stealing network access credentials along the way (including those of IT administrators with unrestricted access to the system), the GRU compromised approximately 29 different computers on the DCCC network.

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Compromises ~29 DCCC hosts
(April 12+)

Democratic Party

Democratic National Committee (**DNC**)

Democratic Senatorial Campaign Committee (**DSCC**)

Democratic Congressional Campaign Committee (**DCCC**)

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VPN

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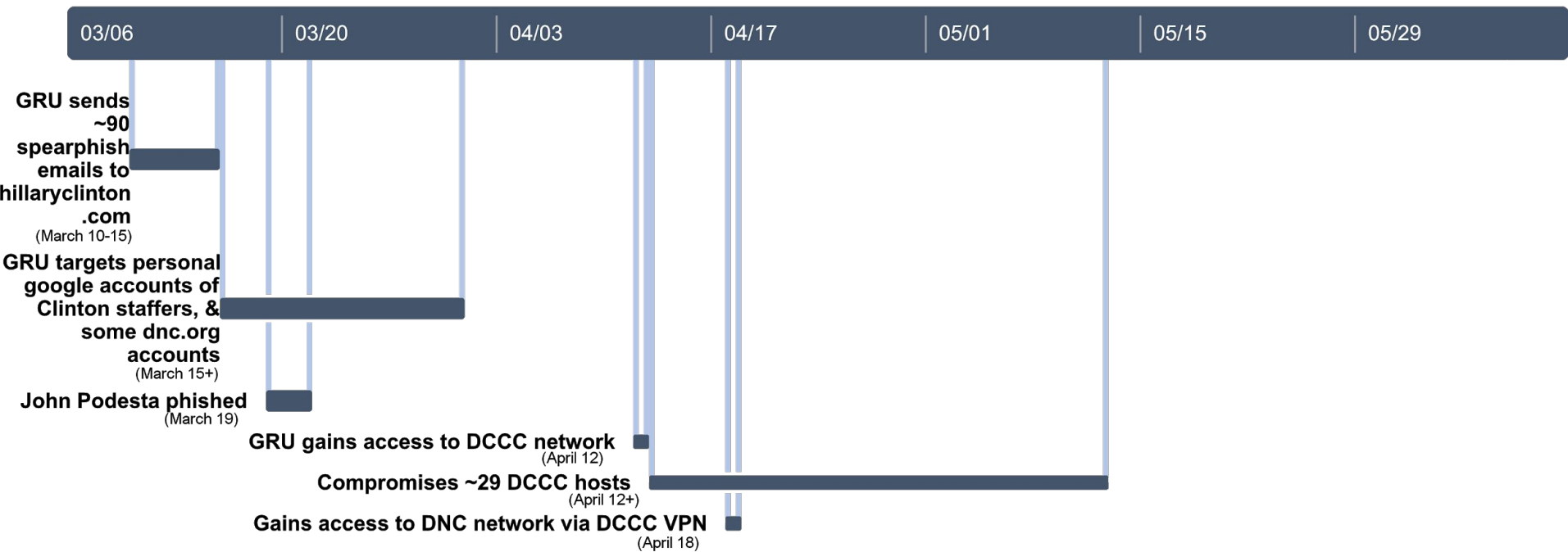(April 18)

Recommendations
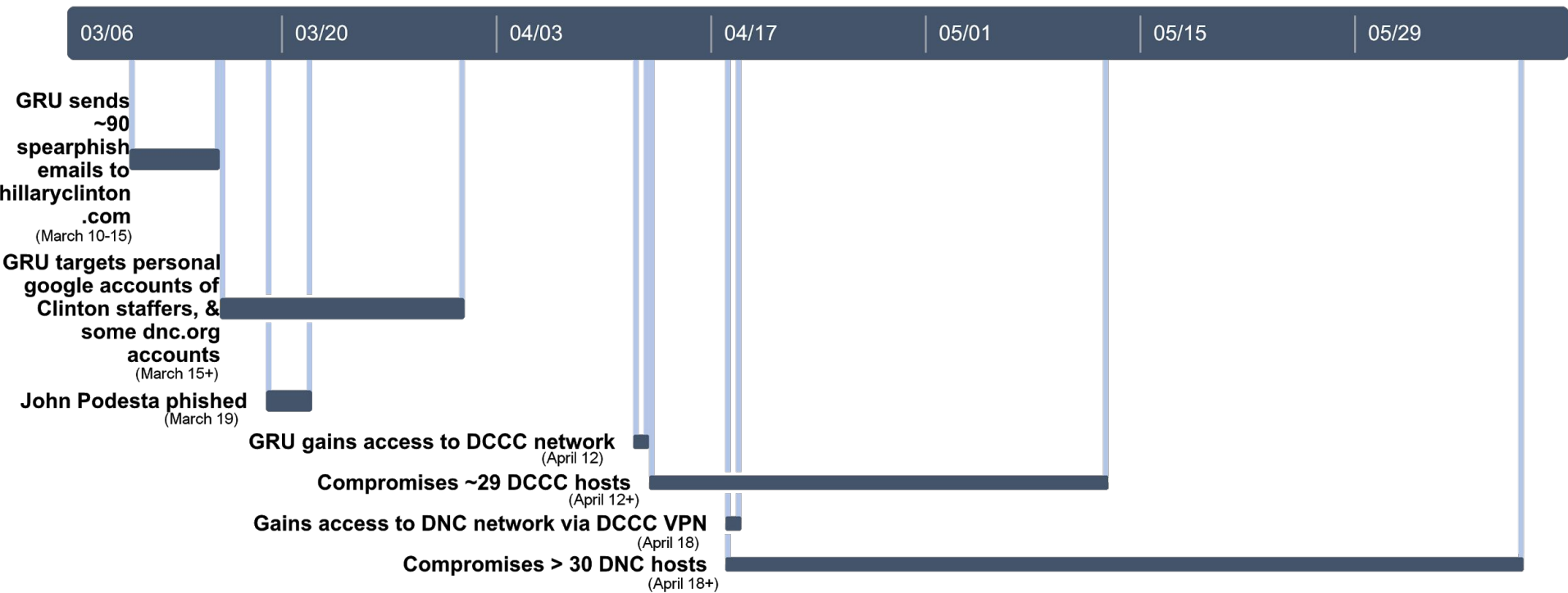
- **"just" don't allow 3rd party access into your network**

The VPN in this case had been created to give a small number of DCCC employees access to certain databases housed on the DNC network.

* Report Volume 1, p38

Recommendations

- ~~"just" don't allow 3rd party access into your network~~

- segregate access, practice least privilege, add monitoring

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Compromise removed
(June 8)

Installed Tools

- **X-Agent:**

  - **Log keystrokes, take screenshots, gather filesystem/OS info, etc**

- **X-Tunnel:**

  - **Create an encrypted tunnel for large-scale data transfers**

- **Mimikatz**

- **rar.exe**

Stolen Data

- **keylog sessions containing passwords, internal communications, banking information, sensitive PII**

- **internal strategy documents, fundraising data, opposition research, emails from work inboxes**

- **exfiltrated > 70GB in election documents**

Structure of GRU

- **Unit 26165**
  - **spearphishing**
  - **building malware**
  - **mining bitcoin**
- **Unit 74455**
  - **assisted with release & promotion of stolen materials**
  - **"Officers from Unit 74455 separately hacked computers belonging to state boards of elections, secretaries of state, and U.S. companies that supplied software and other technology related to the administration of U.S. elections." (Report Volume 1, p37)**

Exfiltration

```
DNC/DCCC  →  "Middle Servers"  →  "AMS Panel"  →  GRU
```
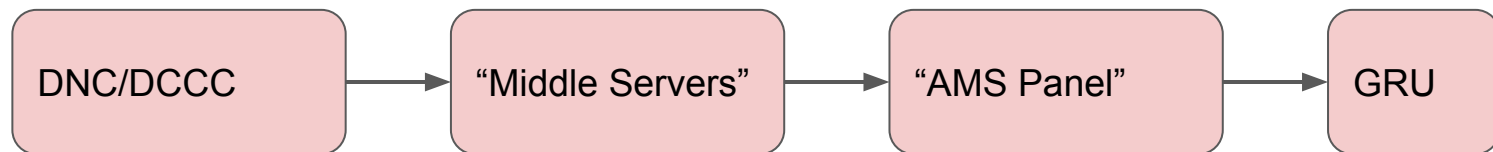
Recommendations

- **alert on mimikatz**

- **endpoint monitoring**

- **network segregation**

- **IDS?**

Blue Team Conclusions

- **attack vectors: spearphishing, lateral movement via overprivileged permissions & mimikatz**

- **defense in depth: 2fa, endpoint monitoring, least privilege, etc**

- **few organizations can defend against a nation state**

Questions

Arkadiy Tetelman (@arkadiyt)