The Full-Stack Problem of Election Security

Jack Cable
What if we had...

- Universal paper ballots?
- Risk-limiting audits in every state?
Election security is a full-stack problem.
The Election Infrastructure
The voting process

- Significant advances in recent years, including properties such as end-to-end verifiability
- Research needed in integrating these technologies
- Expanding to mail-in voting?
What about internet voting?

The Ballot is Busted Before the Blockchain: A Security Analysis of Voatz, the First Internet Voting Application Used in U.S. Federal Elections*

Michael A. Specter

James Koppel

Daniel Weitzner

MIT

MIT

MIT
Election support systems
Voter registration databases

The New York Times

Russia Targeted Election Systems in All 50 States, Report Finds
Election night reporting
Campaigns
Campaign security

> "From:" Google <no-reply@accounts.googlemail.com>
> "Date:" March 19, 2016 at 4:34:30 AM EDT
> "To:" J@n@gmail.com
> "Subject:" "Someone has your password"
>
> Someone has your password
> Hi John
>
> Someone just used your password to try to sign in to your Google Account
> J@n@gmail.com.
>
> Details:
> Saturday, 19 March, 8:34:30 UTC
> IP Address: 134.249.139.239
> Location: Ukraine
>
> Google stopped this sign-in attempt. You should change your password
> immediately.
>
> CHANGE PASSWORD <https://bit.ly/1PibSU0>
>
> Best,
> The Gmail Team
>
> You received this mandatory email service announcement to update you about
> important changes to your Google product or account.
Campaign security

- This is the largest unknown, as campaign security is shrouded in secrecy
- We must view campaign security as non-partisan
  - Increases resources and services available to campaigns
Public Confidence
ELECTION SECURITY
RUMOR vs. REALITY

#PROTECT2020
Mis/Disinformation: supply and demand

Supply
- Platforms: downranking and deplatforming
- Trusted institutions
- Debunking & fact checks

Demand
- Media literacy
- Civics education
We can replicate past successes.

- Increased usage of voter-verified paper ballots
- States beginning to conduct risk limiting audits
Let's fix election support systems

- Much of this includes applying security practices we already know
- Some new research required
  - Can we construct a truly verifiable voter registration database?
Engage in public research.
Thank you.

Contact: cablej@stanford.edu