

# Election Security

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# Why 2017\*, 2018, 2020?

*They'll be back in 2020, they may be back in 2018, and one of the lessons they may draw from this is that they were successful because they introduced chaos and division and discord and sowed doubt about the nature of this amazing country of ours and our democratic process.*

- Former FBI Director James Comey, 3/20/17

*We need a whole of government approach to voting security.*

*If states don't proactively move forward, very shortly we'll be getting into primary season 2018.*

- Sen Mark Warner, co-chair, Senate Intel Comm., 10/4/17

\* Gubernatorial races in NJ and VA this Nov.

# Secure Democracy

- Voter marked paper ballots everywhere
- Mandatory manual post-election Risk Limiting Audits
- No internet voting
- Significantly strengthen cybersecurity of Voter Registration Databases (VRDs)
- Focus on both federal and states

# Bipartisan National Efforts

- Coalition work to insert funding to replace voting technology
  - With strings: require paper ballots + audits in must-pass legislation
- Even if succeeds, almost certainly will be voluntary
- Therefore, work at state level remains critical

# Voter Registration Databases (VRDs)

# Threats to VRDs

- Most VRDs contain party affiliation
  - An attacker could selectively disenfranchise voters by deleting names or changing address
  - If done on a moderately large scale, will result in chaos at the polls
  - Voters could be given provisional ballots, but how can voter's legitimacy be verified if no version of correct database available?
    - Election officials must backup voter reg databases frequently and not write over older versions
    - Significantly improved cybersecurity critical

# Russian Hacking

(Oct 7 anniversary of Johnson/Clapper stmt)

- DHS: 21 states probed or successfully attacked
  - AZ and IL Voter Reg Databases (VRDs) penetrated
  - Probed
    - Alabama, Alaska, California, Colorado, Connecticut, Delaware, Florida, Iowa, Maryland, Minnesota, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Virginia, Washington, Wisconsin
    - Probes could be preliminary to successful attacks
  - What about other 29 states???
  - Georgia accused DHS of attempted hack of VRDs – probably never asked if was targeted (but would have been easy, given vulnerabilities)

# VRD Vendor Hacked

- VR Systems – located in FL
  - Pollbooks and VRDs
  - Used in NC, VA, NY, IL, IN, CA
- Durham, NC
  - System failed throughout the county
    - Heavily Dem. and minority
    - Long lines – many provisional ballots
  - Reports of problems in other counties
    - Wrong location, not listed in VRD, wrongly reported as having voted



# Court case in Durham?

- Legally difficult to impound systems
  - Could be challenging to uncover hack
  - If hack found, wouldn't change Presidential outcome, but could have been smoking gun of Russian interference with VRDs
    - Voters could be disenfranchised by name or address change
    - Voter rolls padded by fake names with vote by mail
- Legal action opposed
  - Could interfere with efforts to protect Dem. state winners – 10,000 spread law

# Voting Technologies

# Paperless DRE states

- 5 states entirely paperless: DE, GA, LA, NJ, SC
- 8 states partially paperless: AR, IN, KS, KY, MS, PA, TN, TX
- No meaningful recount possible in 13 states!
- Most states do not conduct adequate post-election ballot audits, even if they have paper ballots

# 23 Paper ballot states

- ~3/4 of voters use paper ballots (inc. vote-by-mail)
- Alabama, Colorado\*, Connecticut, Florida\*\*, Idaho\*\*\*, Iowa, Maine, Maryland, Massachusetts, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Oklahoma, Oregon, South Dakota, Vermont, Virginia, Rhode Island, Washington\*

\* CO and WA all-mail-ballots, but some counties use DREs with VVPATS for voters in vote centers for in-person early and Election Day voting

\*\* 16 FL counties use paperless DREs for voters w disabilities

\*\*\* 3 ID counties use DREs w VVPATs for voter w disabilities

# Internet Voting

- Return of voted ballot over internet, including as email attachment
- Essentially limited to military and overseas voters
  - ~30 states + DC
  - Typically sign statement relinquishing right to secret ballot
- Fight repeatedly proposals to allow for entire state
  - Eg ballot proposals for CA in 2016

# Internet Voting

- More supported by Ds than Rs
- Both believe that will increase voter participation in general and voting by young people in particular
- Not supported by studies

# Good News: Virginia

- Law to eliminate paperless DREs by 2020
- Commissioner of Elections Edgardo Cortes decided to test security of 5 paperless DREs
  - Sequoia AVC Edge, Sequoia AVC Advantage, Premier/Diebold AccuVote TSX/TSR6, Unilect Patriot, Hart Intercivic eSlate
  - Cybersecurity team, limited experience testing voting machines
    - Had tested WinVotes in 2014
    - WiFi and easily hackable

# Virginia

- If tests failed, claim that machines secure
  - Multiple former reports/tests showed otherwise
  - Needed to be able to simulate user break-in
- Provided reports and info about vulnerabilities
- 3 member Board of Elections: 1 R, 2 Ds
- Sept 8: Cortes recommended decertification
  - After private session, bipartisan B of E voted ***unanimously*** to decertify – even though upcoming gubernatorial election this Nov.
- Domino effect????



# Bad News: New Jersey

- Gubernatorial race this Nov.
- All paperless, includes two of the machines decertified by VA (Sequoia Advantage & Edge)
  - Security testing of Advantage done in 2008 initially suppressed by judge (trade secrets argument)
  - Ultimately released – quite damning
- Law mandating paper trails enacted 2005 with implementation by 2008 – never implemented
  - 2008 audit law:  $\geq 2\%$  of election districts, randomly selected with expansion if discrepancies of  $\geq .1\%$

# Bad News: Georgia

- All paperless Diebold DREs
  - We've known how to rig since 2006
- Perhaps most studied voting system, starting with Hopkins-Rice report in early 2003
  - All reports exposed security vulnerabilities
- CD 6 initial race & runoff held on Diebold DREs
  - \$50M
  - Could easily have used hand counted paper ballots, esp. for runoff

# Georgia

- Kennesaw State Univ. programmed and maintained DREs in GA since early 2000s
  - Aug 2016 Logan Lamb inadvertently downloaded 15 gigs of election related data – notified Center for Election Systems (CES) at KSU
    - Voter Reg Info including SSNs for 6.7M voters
    - Election center using software with unpatched security hole
    - March 2017 colleague discovered not repaired
  - March 2017: FBI investigating breach at CES
  - April 2017 4 poll books stolen from poll worker's car

# Even Worse News: Texas

- Lubbock County
  - >\$6M new paperless Hart InterCivic Verity DREs
- Texas law appears to mandate paperless DREs for vote centers
  - Hart suing Texas SoS over allegations that SoS is exceeding his power by allowing the use of voting systems that produce a voter-verifiable paper record
  - ES&S spoke out against lawsuit
  - Need to organize amicus briefs

# The Texas law

- “Direct recording electronic voting machine” or “DRE” means a voting machine that is designed to allow a direct vote on the machine by the manual touch of a screen, monitor, or other device and that records the individual votes and vote totals electronically.

# Disappointing News: California

- 1% of precincts randomly selected recounted
  - Since 1965
- AB 840 would reduce ballots in audit to those tabulated on election night
  - Exclude many vote-by-mail and provisionals
  - Provide obvious targets for election rigging
  - Pushed by some election officials in response to legal ruling that all VBM ballots must be included
    - Instead of weakening audits, could have requested more time

# What AB 840 tells us

- 1% manual audits revolutionary for 1965 but no longer adequate
- Rather than work on strengthening audits, have pushed to weaken them
- Moral of story: You can't take anything for granted – if you thought that we might eventually all be put out of business, sadly not likely to happen

# What should we be targeting?

- Which states?
- How to determine?
- What needs to be done?
- How does Verified Voting get needed resources?