

Election Threats and Vulnerabilities

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Election Systems Threat Landscape

- Voting Systems
 - highly visible, depended upon for ballot integrity
 - main subject of HAVA
 - targeted by corrupt candidates & supporters - aim to alter outcome
- Election Management Infrastructure
 - less visible, less standardized, built and maintained by counties
 - depended upon for election logistics, voter registration
 - targeted by hostile state actors - aim to disrupt election & legitimacy

Most attention has been on Voting Systems

- Many voting systems (especially DREs) depend on complex software and hardware for integrity of vote
 - early focus was on evaluating and hardening this critical software & firmware - a herculean task
- Current approach focuses on voting *architectures* that can *tolerate* inevitable defects & vulnerabilities
 - “Software Independence” (Rivest & Wack)
 - Paper ballots + post-election audits (RLAs)

Some open issues in Voting Systems

- Usability and Ballot Design
- Role of “Ballot Marking Devices”
- Post election audit practices
- Chain of custody / interactions among security mechanisms
- Disaster recovery
- Public confidence
- Software update / bug fixing vs. certification
- Practical issues: Deployment, funding, vendor marketplace, incentives

Election Management Infrastructure

- Much less visible and receives much less attention than voting systems, but at least equally critical
- Largely ad hoc, bespoke systems maintained by each (county/township) election jurisdiction (5000+ in US)
- Voter registration, precinct pollbook creation, machine provisioning, ballot design, tally, results reporting, public communication
 - Potentially exposed to remote access (and attack)
- Many functions outsourced to contractors and vendors

Consequences of infrastructure compromise

- Disruption of election day logistics
- Disenfranchisement of large numbers of voters
 - provisional ballots mostly don't scale
- Incorrect outcomes reported
- Loss of confidence in outcome / legitimacy of election
- Can be tailored to favor candidates