Securing Digital Democracy

Lecture 10 | *E-Voting and Public Policy*

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Election Policy in the U.S.

Federal

Civil Rights
Minimum Standards
Advisory Guidelines

State

Requirements
Certification
Central Administration

Local

Equipment Purchases
Implementation
Run elections

State Laws

Lack of uniformity or consistency

Regulatory capture   **Vendors**   **Regulators**

Antiquated rules

1990 FEC Standards

Federal Election Commission

Voluntary minimum standards,
    eventually adopted by majority of states

Requirements:

"Shake and bake" tests

Weak software standards

Extremely weak security standards

Help America Vote Act (HAVA)

Replace punched cards and lever machines

>$2 billion to provided to states

Passed in 2002; Deadline in 2006

Created new agency, Election Assistance Commission (EAC)

EAC maintains Voluntary Voting System Guidelines (VVSG)

First VVSG standards took effect 2007

Voluntary Voting System Guidelines (VVSG)

Technical Guidelines Development Committee, managed by NIST

2005 Guidelines – became effective in 2007

Much more detailed guidelines

Large loopholes (e.g., COTS, doesn't require paper trail)

2007 Draft Guidelines – never adopted by the EAC

Complete rewrite

Software independence!

Open-ended vulnerability testing!
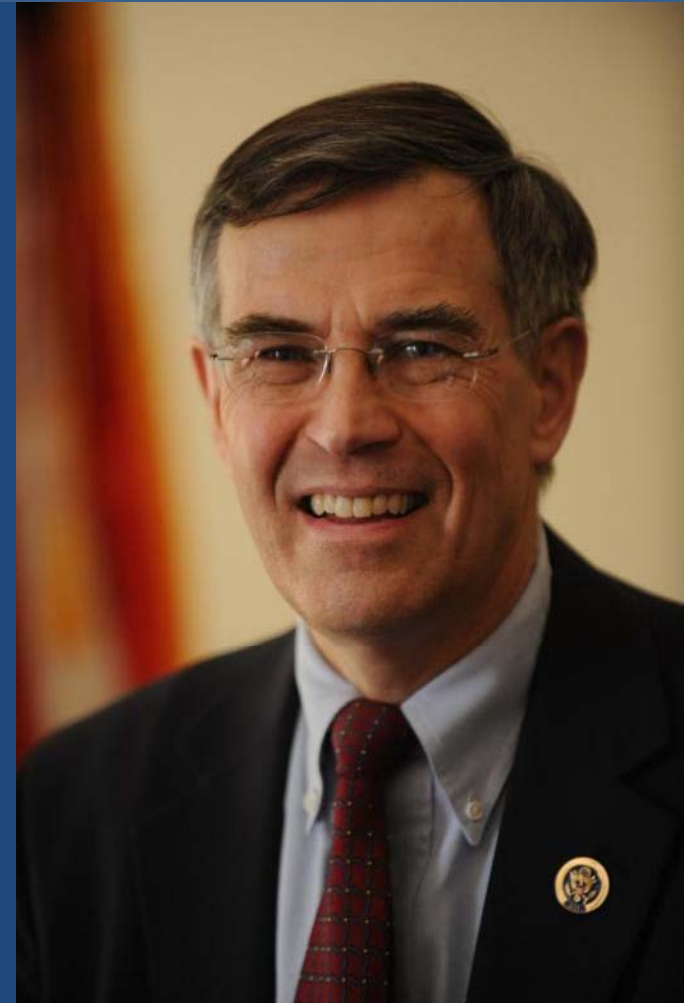
The Holt Legislation

Require a voter-verified paper record
    (*Later:* a voter marked paper ballot)

Prohibit undisclosed software

Prohibit Internet connection

Mandatory random audits

Official photo of Rep Rush Holt; public domain

State-by-State Efforts

State-level VVPR Requirements

VVPR Map Legend

Legislation / Regulation Requiring Paper Ballots (31)	
Mixed Requirement (1)	
Proposed, Not Yet Enacted (8+DC)	
Not Yet Proposed (10)	
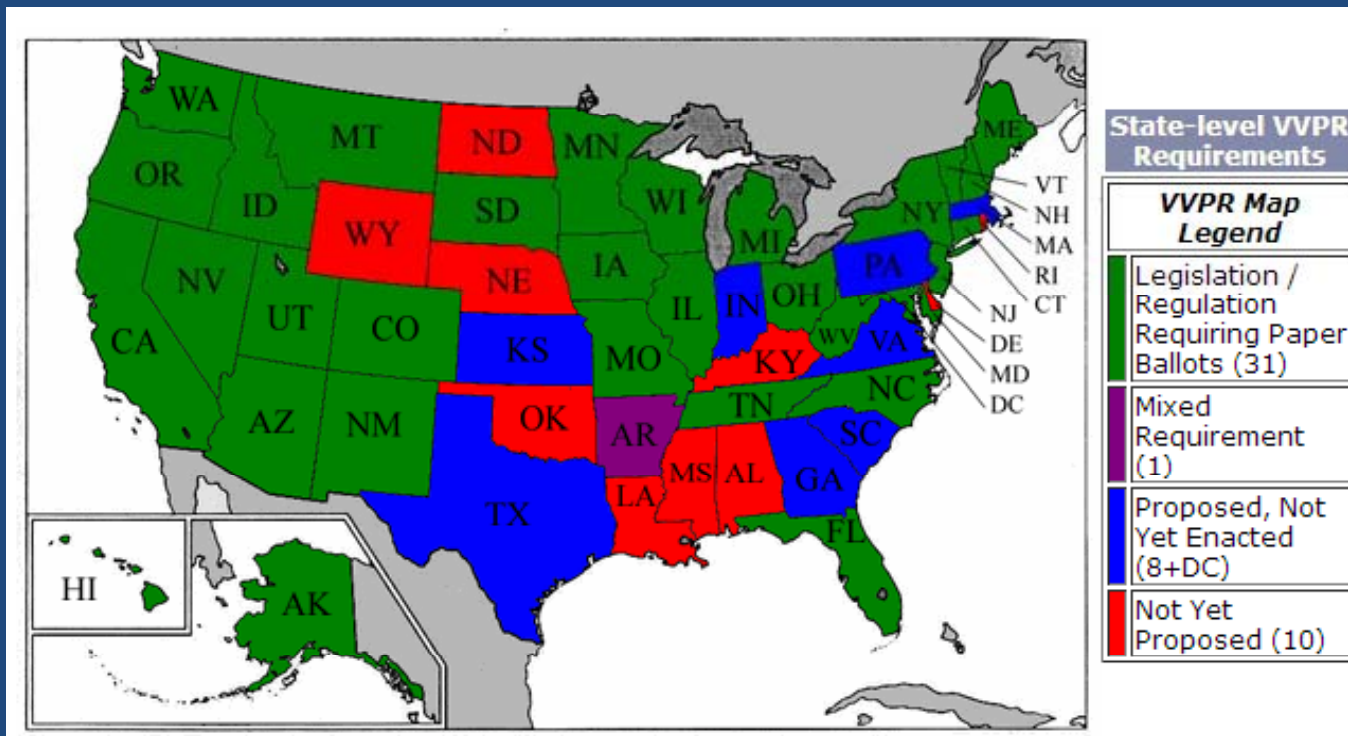
Map and data from Verified Voting. http://www.verifiedvoting.org/article.php?list=type&type=13

Testing and Certification

Independent Testing Authorities (ITAs)

Majority of states incorporate Federal guidelines

Require machines to be tested for compliance by ITAs

Small number of approved private companies

Incentives?   **Transparency?**   **Adequacy?**

Approaches to Security Testing

Conformance Testing	Open-ended Testing
Checklist approach	Adversarial approach
Mechanical inspection and application of tools	Creative application of security mindset
Presence of required mechanisms	Presence of exploitable vulnerabilities

Conformance Testing

ITA Certification

Open-ended Testing

Hopkins Report	**Princeton Report**
Hursti Hack	**California TTBR**
SAIC Report	**Ohio EVEREST**

Recommendations

Strengthened, Uniform Standards

Cover entire election system, not just equipment

Address accuracy, security, accessibility, usability, transparency

Require public reporting and disclosure of problems

Election Administration

Ensure transparency and public participation

Provide adequate resources to election officials

Reduce number of races, simplify ballot design

Routine Testing and Auditing

Auditability must be a technical requirement

Mandate realistic pre-election testing of usability and function

Mandate risk-limiting post-election audits to high confidence

Allow time to conduct audits and recounts before certification

Conservative Approach to New Technology

Internet voting should be prohibited for the foreseeable future

Ensure new technology *really* solves an *actual* problem

Open technology to realistic, public, independent review
   and simulated adversarial testing

Systems used for counting votes must be software independent

What You Can Do!

Discuss
voting security issues with your friends and in your community

Reach Out
to your local election officials and talk about your concerns

Get in Touch
with your elected representative to encourage reform

Learn More
about election security issues; links from the course are a start

Volunteer
as a poll worker or election observer; apply the security mindset

Vote!
and carefully watch the process as you do; be a *micro-observer*

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