

# Voting Technology and Issues for November 2004

Joseph Lorenzo Hall<sup>1</sup>, SIMS

1. Voting is one of the most complex system-security problems.
  - Intent – Need to translate the intent of the voter into a ballot choice.
  - Anonymity – Need to be able to protect ballot privacy.<sup>2</sup>
  - Secrecy – A voter should not be able to prove to someone how they voted.<sup>3</sup>
  - Integrity – Aggregate vote numbers must be preserved throughout canvassing.<sup>4</sup>
  - Accessibility – Need to support multiple disabilities, languages.
2. What kind of technology will be used in November?<sup>5</sup>
  - Paper Ballots (1%), Punch Card (14%)
  - Lever (14%), Optical Scan (34%), Electronic (31%)
3. These last three make up about 80% of all votes cast. Why is this troubling?
  - No independent audit trail available. (DREs and Electronic)
  - Optical scan and electronic voting machines and their associated vendors are notoriously protective of their technology.
  - Direct Recording Electronic (DRE) voting machines are buggy and much more susceptible to undetectable manipulation on large scales.
  - “Federal certification” (against FEC/EAC guidelines) is not a detailed computer security analysis and the results are completely confidential and only released to the vendor. Plus, standards are old and little money has been allocated to update them.
  - State election officials are not allowed detailed access to the technology.
  - The official record of the vote in lever and DRE machines is something that isn’t a manifestation of the voter’s intent to cast a vote. Thus, recounts in these machines will only detect differences if vote data has changed or if code bungles counting of votes.
  - Activists, computer scientists and concerned voters have started to demand an independent audit trail for DREs, most often a Voter Verified Paper Audit Trail.
4. What can you do to help? (Ordered from least to most effort involved)
  - Know the technology you’ll be voting on (or working with).<sup>6</sup>
  - If you’re concerned about your vote not counting: vote absentee. This will ensure that the “official record” of your vote is your ballot.
  - If you are usability-savvy, *don’t* vote absentee, vote on a DRE (if possible). Run the machines through the usability ringer: use magnification features, vote in another language (if you’re familiar with one), select two votes at once and see which is selected, use the sight-impaired voting features (headphones, keypads).
  - We need technically proficient folks to work at the polls or observed election processes.
  - If you are technically proficient, volunteer for Verified Voting’s TechWatch<sup>7</sup> program.
5. Discussion questions.
  - Why hasn’t there been a similar uproar about lever machines (used since 1890s)?
  - Other countries don’t seem to have such a problem with voting, why not?
  - What other types of independent audit trails can you think of?
  - Should the government mandate that voting machine software is open source?

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<sup>1</sup> Email me at [joehall@berkeley.edu](mailto:joehall@berkeley.edu). This work was done in collaboration with the Electronic Frontier Foundation and the Samuelson Law, Technology and Public Policy Clinic at the University of California at Berkeley, Boalt Hall School of Law.

<sup>2</sup> For a brief overview of privacy issues in electronic voting, see: Keller, A.M., Mertz, D., Hall J.L., and Urken, A. "Privacy Issues in an Electronic Voting Machine" *forthcoming*, *ACM Workshop on Privacy in the Electronic Society* (28 October 2004).  
<http://pobox.com/~joehall/papers/privacy-electronic-voting-WPES-2004.pdf>

<sup>3</sup> Except for West Virginia, which still provides that "... the voter shall be left free to vote by either open, sealed or secret ballot, as he may elect." (W. Va. Const. Art. IV, § 2 (2003))

<sup>4</sup> “Canvassing” is the combination of aggregate vote totals at the precinct, county, state and federal levels.

<sup>5</sup> Note: 7% of voters will vote in counties using “mixed” technologies. Numbers are percentages of registered voters using a given technology. Source: Election Data Services Inc. survey, as of May 4, 2004.

<sup>6</sup> <http://www.eff.org/Activism/E-voting/>

<sup>7</sup> <http://vevo.verifiedvoting.org/techwatch/>