

Internet Voting: How Far Can We Go Safely?

By [Ed Felten](#) - Posted on June 5th, 2009 at 9:41 am

Yesterday I chaired an interesting panel on Internet Voting at [CFP](#). Participants included Amy Bjelland and Craig Stender (State of Arizona), Susan Dzieduszycka-Suinat (Overseas Vote Foundation) Avi Rubin (Johns Hopkins), and Alec Yasinsac (Univ. of South Alabama). Thanks to David Bruggeman and Cameron Wilson at [USACM](#) for setting up the panel.

Nobody advocated a full-on web voting system that would allow voting from any web browser. Instead, the emphasis was on more modest steps, aimed specifically at overseas voters. Overseas voters are a good target population, because there aren't too many of them -- making experimentation less risky -- and because vote-by-mail serves them poorly.

Discussion focused on two types of systems: voting kiosks, and Internet transmission of absentee ballots.

A voting kiosk is a computer-based system, running carefully configured software, that is set up in a securable location overseas. Voters come to this location, authenticate themselves, and vote just as they would in a polling place back home. A good kiosk system keeps an electronic record, which is transmitted securely across the Internet to voting officials in the voter's home jurisdiction. It also keeps a paper record, verifiable by the voter, which is sent back to voting officials after the elections, enabling a post-election audit. A kiosk can use optical-scan technology or it can be a touch-screen machine with a paper trail -- essentially it's a standard voting system with a paper trail, connected to home across the Internet. If the engineering is done right, if the home system that receives the electronic ballots is walled off from the central vote-tabulating system, and if appropriate post-election auditing is done, this system can be secure enough to use. All of the panelists agreed that this type of system is worth trying, at least as a pilot test.

The other approach is use ordinary absentee ballots, but to distribute them and allow voters to return them online. A voter goes to a web site and downloads a file containing an absentee ballot and a cover sheet. After printing out the file, the voter fills out the cover sheet (giving his name and other information) and the ballot. He scans the cover sheet and ballot, and uploads the scan to a web site. Election officials collect and print the resulting file, and treat the printout like an ordinary absentee ballot.

[Kevin Poulsen](#) and [Eric Rescorla](#) criticize the security of this system, and for good reason. Internet distribution of blank ballots can be secure enough, if done very carefully, but

returning filled-out ballots from an ordinary computer and browser is risky. Eric summarizes the risks:

We have integrity issues here as well: as Poulsen suggests (and quotes Rubin as suggesting), there are a number of ways for things to go wrong here: an attacker could subvert your computer and have it modify the ballots before sending them; you could get phished and the phisher could modify your ballot appropriately before passing it on to the central site. Finally, the attacker could subvert the central server and modify the ballots before they are printed out.

Despite the risks, systems of this sort are moving forward in various places. Arizona has one, which Amy and Craig demonstrated for the panel's audience, and the Overseas Vote Foundation has one as well.

Why is this less-secure alternative getting more traction than kiosk-based systems? Partly it's due to the convenience of being able to vote from anywhere (with a Net connection) instead of having to visit a kiosk location. That's understandable. But another part of the reason seems to be that people don't realize what can go wrong, and how often things actually do go wrong, in online interactions.

In the end, there was a lot of agreement among the panelists -- a rare occurrence in public e-voting discussions -- but disagreement remained about how far we can go safely. For overseas voters at least, the gap between what is convenient and what can be made safe is smaller than it is elsewhere, but that gap does still exist.