



Safe(r) Use of Web Based Technology for Voting

NIST Future of Voting Systems Symposium

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Disclaimer

- I am employed by SRI International
- I am on loan (IPA) to the National Science Foundation
- Nothing I am about to say represents the position of SRI, NSF, the US Government... and maybe not of the speaker

Fact: We don't know how to keep web sites secure

THREAT LEVEL

hacks and cracks

cybersecurity

breaches

Citi Credit Card Hack Bigger Than Originally Disclosed

BY KIM ZETTER 06.16.11 10:35 AM

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Citigroup has been forced to reveal that a recent hack of its network exposed the financial data of more than 360,000 customers, a much higher number than the bank originally disclosed.

Business **Federal Reserve**

Federal Reserve hacked

US central bank confirms intrusion after hacktivist group Anonymous was claimed to have stolen 4,000 bankers' details

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Burger King Twitter account back up after Monday afternoon hacking; company apologizes

By Associated Press February 18, 2012

The New York Times

Wednesday, January 30, 2013 Last Update: 11:14 PM ET

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s in Attacked names for Month

ANONYMOUS

Anonymous Hacks Department of Justice Website, Threatens to Launch 'Multiple Warheads'

[Robert Kessler](#)

The website belonging to the [United States Sentencing Commission](#) is down this morning, following a hack of the site, which normally bears information about sentencing guidelines. The site showed a nearly 10 minute long YouTube video and the same

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There is no reason to believe that election officials or vendors can do any better



What Can We Do (Reasonably) Safely?

- Provide voter information about candidates/issues, dates, how to request and return ballots, etc.
- Voter registration, if integrated with authoritative sources (e.g., DMV)
- Address changes, if use US mail confirmation
- Distribute blank ballots
 - Especially if sample ballots are published in newspapers and other accessible locations for confirmation
 - Why not make blank ballots freely available without authentication, and focus on validating the return?
- ***Cautions:***
 - How do we educate voters to distinguish between real and phishing messages relating to elections?
 - What monitoring will there be of web sites, even for (relatively) low risk sites?

Running Web Servers is Not Free!

- Hosting costs are just the beginning
- Need 24/7 security monitoring
- Regular security patch installation (and retesting)
- Certification/recertification
- Regular red-teaming (penetration testing) is a must – not just one time!
- Disaster recovery from the inevitable failure/compromise – not just a paper exercise

- Outsourced cloud services are a cheaper option
 - Economies of scale with security monitoring & patching
 - But what are the issues with having Google/Amazon/Microsoft/Northrop Grumman/Lockheed Martin/etc employees having access to ballots – especially if considering marked ballots?
 - Doesn't eliminate need for certification, or red-teaming of the application (but may make it more complicated)

Learning from Oscar



Academy Awards E-Voting: What You Can Learn...

Posted by Tim Madsen

According to [The Hollywood Reporter](#), online voting for Oscar nominees held by the Academy of Motion Picture Arts & Sciences that occurred Dec. 17 through Jan.3 encountered problems that might have had a negative effect on participation.

The biggest hurdle from e-voting put in place by the Academy was forgotten member login credentials. This isn't surprising. Misplaced or lost member login information is the number one problem associated with online voting.

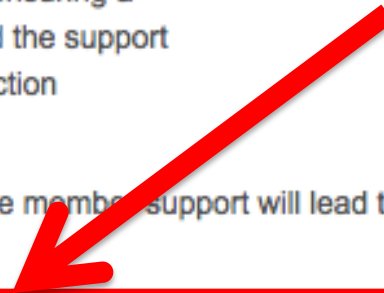
If your member organization is considering [online voting](#), be ready to have the proper support in place for members. Make it convenient for members to contact your organization through multiple channels including: phone support, email, and web chat. During your election, have staff dedicated to assisting members with login, resetting sign-in information, and ensuring a pleasurable (and quick) voting experience. Clearly list contact information and the support available on both the login page of your online voting system and on your election announcements.

As the Academy quickly found out, online elections that don't have appropriate member support will lead to frustrated voters who are likely to criticize not only the online voting system but the entire process.

An easy way to encourage member participation via online voting is to implement [secure embedded login links](#) into your email invitations and reminders. Embedded login links allow your members to securely access your organization's web election with one simple click. Each link is unique, and when clicked, automatically authenticates voters and allows them into your organization's online election. With a secure, one-click to your election, members don't have a reason to contact support to retrieve lost usernames or passwords.



Training voters to be phishing victims?



Where Do We Need Research?

- E2E system usability by voters and administrators
 - Highly dependent on correct setup – how do we make the systems so they can't be set up incorrectly?
- Can we use other technologies (e.g., smart cards, next generation credit cards) to allow E2E voting over the internet?
- Can we relax some of the historical requirements (e.g., ballot secrecy) as a way to allow validation?
- How do actual operations by election officials support or compromise the security of voting systems?



Questions?



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