Online Voting
Lessons from (NSW) Australia's iVote project

WebRoots Democracy
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NSW Electoral Development

- 1787 an Act of the British Parliament made possible the first fleet and set out the governance of the new Colony making military governors of New South Wales absolute rulers.

- First settlement arrived in January 1788 at Sydney, consisted of about 850 convicts and their Marine guards and officers, led by Governor Arthur Phillip.

- In 1823 the British Parliament passed "The New South Wales Act", creating an appointed Legislative Council to help manage the colony.

NSW Electoral Development

- 1842 British Parliament passing New South Wales' <u>first Constitution Act</u> required expansion of Legislative Council to 36
  - 12 nominated by the crown
  - 24 <u>ELECTED</u> by land-owners

- <u>First election 1843 </u>resulted in <u>several violent incidents</u>, including a massed attack on the polling booth on Sydney's Observatory Hill which resulted in <u>the Riot Act being read</u> and at least <u>one fatality</u>.

NSW Electoral Development

- 1856, the bicameral Parliament opened.

- 1858, an Electoral Reform Act gave males right to secret ballot (Australian ballot)

- 1901 Federation and statehood

- 1902 Current NSW Constitution Act & women get vote

- 1926 lower house optional preferential voting and single member electorates

- 1928 compulsory voting

NSW Electoral System Today

- **Universal suffrage** – Australian citizen resident in NSW

- **Secret ballot** - no connection retained between ballot and elector

- **Vote at any venue** – vote at any venue in NSW (not precinct voting)

- **Enrolment voting** – enrol and vote at venues on election day

- **Compulsory enrolment** - approx.95% eligible electors enrolled

- **Compulsory voting** - approx. 92% enrolled vote

- **Bicameral with Elected Upper House**

- **NO Proxy Voting**

- **No proof of identity** needed to vote

NSW Voting System

- Enrolled 2015 about <u>5 million electors</u> (pop. now about 8M)

- Election <u>fixed day</u> is 4th Saturday in March <u>4 year terms</u>.

- Lower House Legislative Assembly (LA)
  - 93 members and districts
  - Alternative Vote method (Optional Preferential System)

- Upper House Legislative Council (LC)
  - 42 Legislative Councillors elected for 2 terms (21 per term)
  - Single Transferable Vote method (Optional Preferential Proportional Representation)

NSW Electoral System Overview

Voting Channels allowed at 2015 election in NSW:

- **Polling Place** attendance in district election day votes - 67.37%

- **Pre-poll** attendance in district prior to election day votes - 14.07%

- **Absent** attendance out of district vote – 6.33%

- **iVote** remote electronic vote - 6.22%

- **Postal** vote - 4.46%

- **Enrolment** attendance vote - 0.92%

- Declared Institution - 0.31%

- Provisional/Silent - 0.31%

The Tablecloth – LC 1999

Problems with paper voting

- Relies on the **electoral authority** and staff making no errors
- 40% of lower house and all upper house votes **not effectively scrutinised**
- Voting **venues increasingly hard to find**
- **Chain of custody** necessary and hard to prove with secret ballot
- **Staff increasingly failing** to perform tasks reliably
- Some electors find it **difficult to go to voting venues**
- **Postal voting** becoming problematic

Warehouses and temporary staff

Final result relies on electoral authority and staff making no errors.

Disclaimer

- Anything I say about evoting applies only to its use in Australia.

- I am NOT suggesting iVote or any similar evoting system is suitable for use in the UK electoral system or any other non Australian jurisdictions.

- Every jurisdiction has to assess the use of technology in elections independently.

How did iVote come about?

- Judicial decision in 2008 required the use of braille ballot papers at all polling places for blind voters

- Remote electronic voting using touch tone phone or web browser was considered by parliament and peak bodies for blind a better outcome than braille ballot papers

- Commissioner was trusted by parliamentary oversight committee & committee chair was legally blind

- Opportunity to address problems with interstate and overseas voting problems and assisted compulsory voting.

What was iVote in 2015?

1. Remote electronic Voting system for web or telephone;
   - Web browser over internet (including mobiles)
   - DTMF phone over PSTN
   - Human operator using telephone to enter vote in web browser

2. Operation;
   - Registration required and only for Blind, Disabled, Remote and Interstate or Overseas
   - Registration ran over a month before election day
   - Voting during early voting period (two weeks before election day) and election day
   - Optional Verification service available by phone

3. 283,669 iVoted in 2015, while 46,864 iVoted in 2011.

4. **Not a replacement** for **attendance voting** with **paper** ballots
   (currently about 87% of votes are paper ballots issued by polling official in venues)

iVote Design Principles

- Voting protocol must be **comprehensible**.

- Security is delivered using a combination of **People-Process-Technology**

- **Segregating** of **Duties, Data, Systems and Communication Channels** increases difficulty of successful attack without detection.

- System designed to be **tamper evident.**

- Voter **coercion not considered a significant** issue in NSW hence in the clear validation ok.
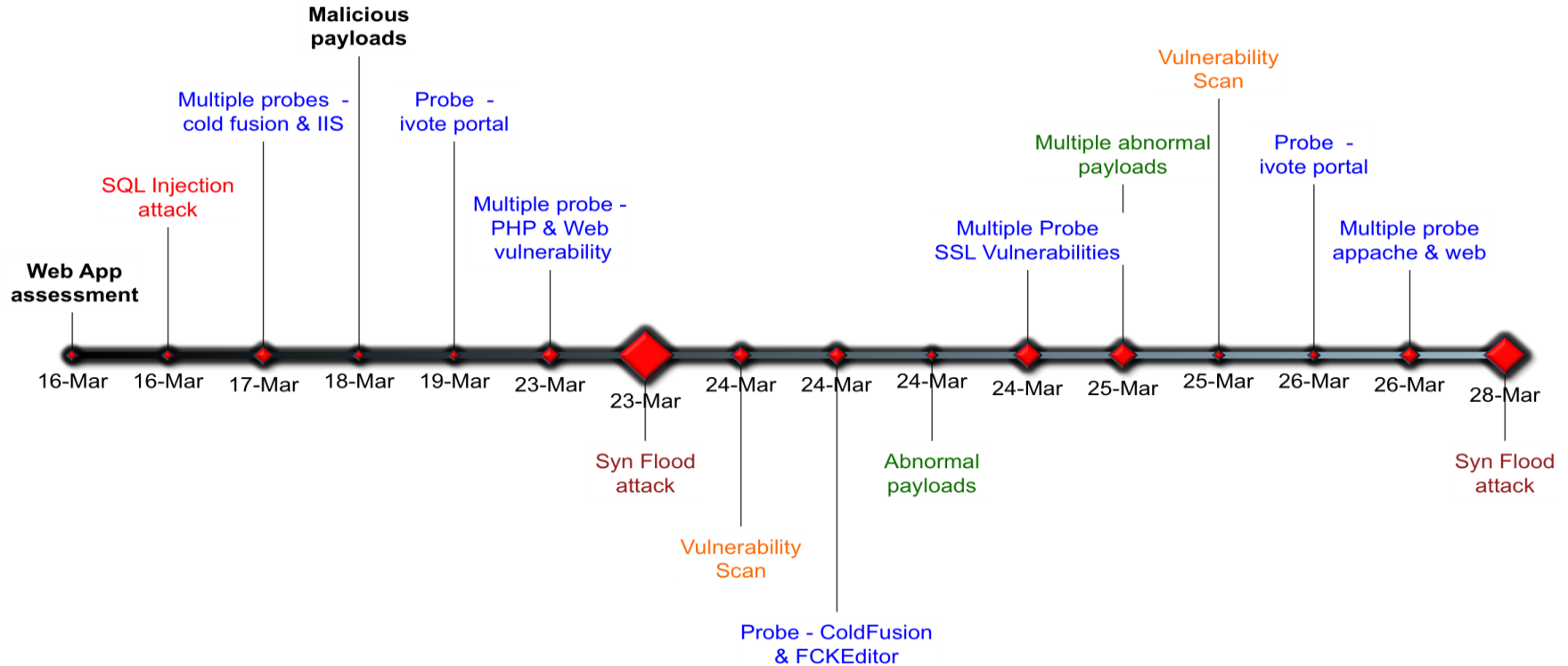
iVote Architecture
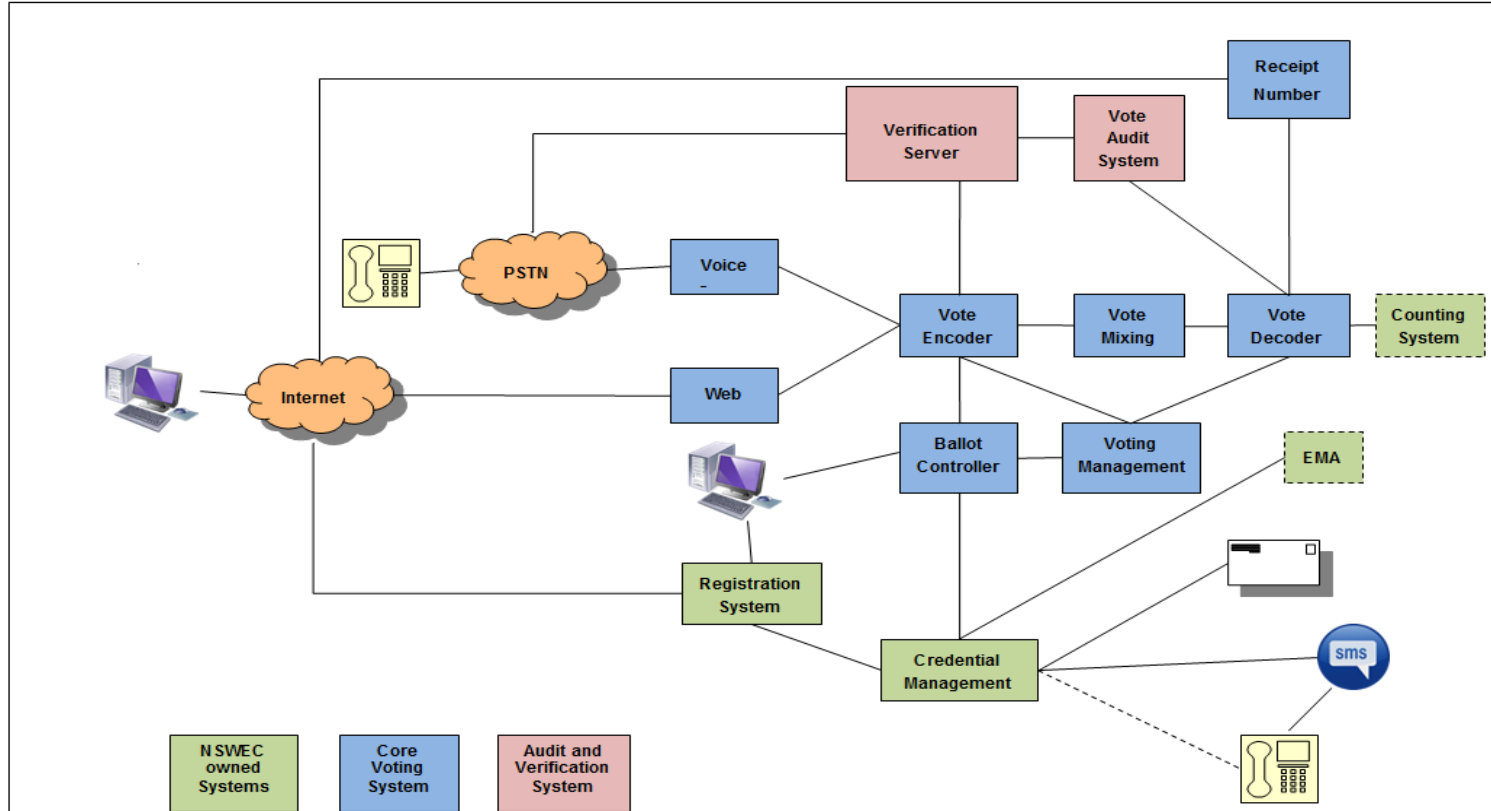
iVote Verification

- Voter can **verify vote is captured as cast** prior to close of polls – **1.7% verified**

- **Auditor** verifies all votes **decrypted** match votes held in verification system

- Voter can **verify their vote is in count** after close of polls

iVote® Attack Timeline

Vulnerabilities

- There will always be vulnerabilities in computer systems, the real issue is what risk do they cause to the overall system's operation vs the benefits the system delivers.

- Security researchers found **FREAK vulnerability** during election and went to media before telling Commission.

- **FREAK** vulnerability was ultimately acknowledged to be difficult to exploit and was mitigated as soon as advised by researchers.

Registration Impact from FREAK
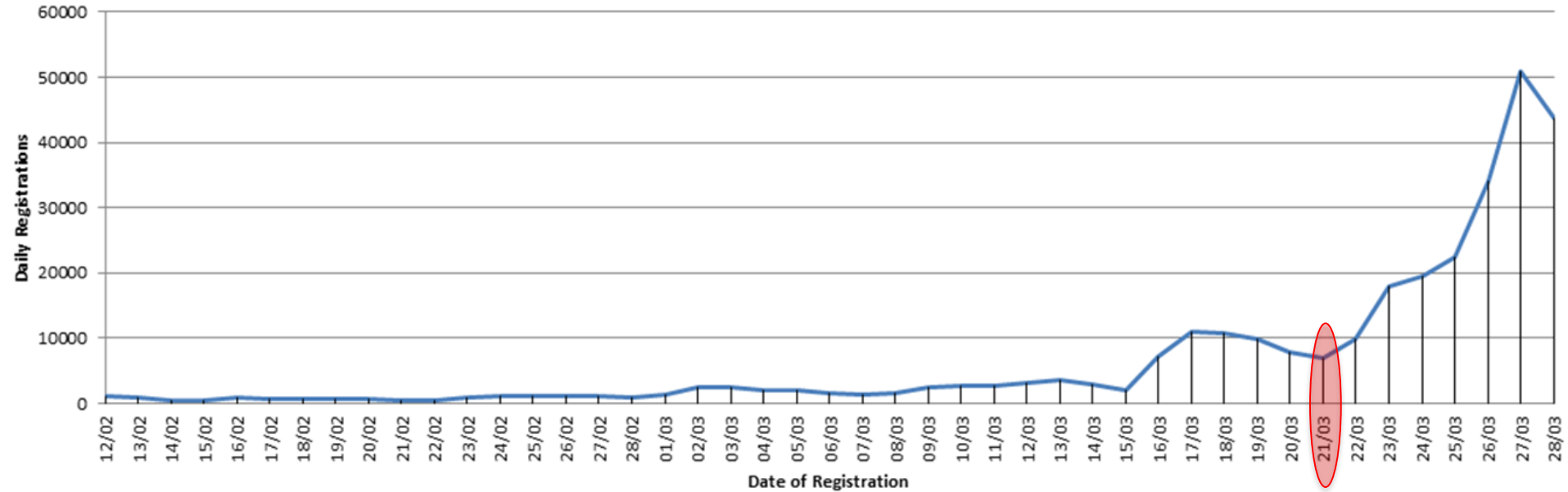
Main Operational Risk

DDOS

IPSOS iVote Sentiment Analysis

Mode of Voting	Satisfaction			Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied
	Very	Fairly	Total			
Election Day attendance voting	49%	37%	**86%**	4%	6%	4%
Pre-poll attendance voting	70%	23%	**93%**	2%	4%	1%
Postal voting	73%	22%	**95%**	0%	2%	4%
iVote	80%	17%	**97%***	1%	1%	0%

* Increase from 2011 which was 92%

iVote security and trust

- **86% to 90%** of iVoters surveyed **trusted the iVote proces**s.

- **1.7%** iVoters used **verification** service, of which 80% to 87% of those surveyed did so to be confident that they vote was successful.

- **91%** of verification service users were **satisfied** or very satisfied with verification service

- Overall **98%** of respondents said they would **recommend using iVote**.

Benefits of using iVote?

- Allow **independent voting for blind and low** vision voters.

- **Increase participation** of voters **outside NSW.**

- Two channels delivers **greater electoral Integrity.**

- **Replacement for Postal voting.**

- **Electors want it.**

iVote vs Postal Reliability

Comparison between iVote vs Postal Vote failures to vote

iVote	SGE 2011		SGE 2015	
	No. Votes	%	No. Votes	%
Registered for iVote but voted some other way	2,756	5.4%	10,827	3.6%
iVoted	46,864	91.7%	283,669	94.6%
Registered for iVote but **did not vote at all**	1,483	2.9%	5,394	1.8%
Accepted iVote Registrations	51,103		299,890	

Postal	SGE 2011		SGE 2015	
	No. Votes	%	No. Votes	%
Registered for Postal but voted some other way	34,709	11.0%	54,736	18.8%
Postal Voted	245,295	77.8%	203,577	69.9%
Registered for Postal but **did not vote at all**	35,178	11.2%	33,122	11.4%
Accepted Postal Registrations	315,182		291,435	

Problems with Scrutiny

- Current scrutiny processes designed for paper voting in a polling place not for elections using computers.

- Currently partisan scrutineers appointed with little technology audit knowledge. They are appointed by parties or candidates to scrutineer iVote and other computer based processes.

- An electronic voting board should be created to scrutinise computer processes. This needs legislative change.

New iVote System for 2019

- In November 2017 an "Initiation brief for the iVote Refresh Project" was released.

- The brief outlined a tender process to upgrade/replace the core voting and potentially the verification components in the current system for the 2019 election.

- "iVote Refresh Program Procurement Strategy" was issued in June 2017 stated a contract would be executed in February 2018.

- A $1.926M AUD contract awarded to Scytl 20th April 2018.

The Wilkins Report

Report proposed completion in May 2018.

The terms of reference of the report are:

1. Whether the security of the iVote system is **appropriate and sufficient**.
2. Whether the **transparency** and provisions for auditing the iVote system are **appropriate**.
3. Whether adequate **opportunity for scrutineering of the iVote** system is provided to candidates and political parties.
4. What **improvements to the iVote** system would be appropriate before its **use at the 2019 State General Election**.

Conclusion

- **All voting channels have risks**

- **Paper voting integrity** currently relies on election body making no errors

- Use of internet Voting needs to be considered on a **jurisdiction by jurisdiction basis**

- **iVote should continue and supplement not replace attendance voting with paper in NSW**

More information

General Information on iVote

Details about iVote System
https://www.elections.nsw.gov.au/about_us/plans_and_reports/ivote_reports

NSWEC Website information about iVote
https://www.elections.nsw.gov.au/voting/ivote

iVote website with access to practice system
http://www.ivote.nsw.gov.au/

Internet Voting and Voter Coercion
http://www.elections.nsw.gov.au/publications/reports/commissioned_reports/NSWEC_2013_Report_V2.0.pdf