Challenging the Geneva E-voting System in Court

Richard Hill
(private citizen)

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Bern University

Outline

- What am I doing

- Why am I doing it

- Who am I

- The legal process

  – Receivability

  – Substance

- The actual procedures

  – There were several and one is pending

- Next steps

What am I doing

- Asking court to find that the Geneva system:
  - Violates cantonal law
  - Violates federal law (Constitution)
- Because:
  - No guarantee that vote transmitted reflects voter's intent
  - Family member can vote for another member
  - Confidentiality not guaranteed

Why am I doing it

- Because politicians don't know or understand that:

  - There has long been a consensus amongst computer scientists that e-voting is risky

  - The rather simple Geneva system is inadequate

  - Appropriate systems can be put into place

For the first two points, see for example Simons, B. and Jones, D. W. (2012), "Internet Voting in the US", *Communications of the ACM,* October, Vol. 55 No. 10, p. 68, available at: http://dl.acm.org/citation.cfm?id=2347754 ; for the third point see reference later

Who am I

- Not a lawyer (but have some legal training and experience)
- BS Math MIT, PhD Statistics Harvard
- But mostly worked as computer programmer and IS manager, including in telecommunications
- CV is at http://www.hill-a.ch

The legal procedure

- At cantonal level:
  - Receivability
  - Substance (both cantonal and federal law)
- At federal level (Federal Tribunal - TF)
  - Receivability of federal case
  - Receivability of cantonal case, but restricted review: arbitrary
  - Substance: full review for provisions related to voting, even if cantonal law (but relies on facts established by cantonal tribunal – but there are some exceptions)

The Swiss legal system is such that a private citizen can make such court challenges at reasonable cost

Receivability

- Within time limit

- Right to complain (e.g. is a voter)

- Formal rules respected (format, language, number of copies, etc.)

➢No problem at federal level

➢More difficult than expected at cantonal level

Challenge is to cantonal-only vote, where all voters could use e-vote. Hard to challenge federal vote, since percent of e-voters is limited (result probably not affected by e-vote).

Substance: legal basis

Federal law: 34 Cst. and TF case-law

- Results must reflect the voters' intent
- Vote must be secret (with some exceptions)
- One person-one vote
- Need not prove that irregularities did affect result: it suffices that irregularities could have affected result

Cantonal law: art. 60 LEDP

- Voter must use equipment that is sufficiently secure
- Government publishes security rules
- Government can suspend voting if insufficient security

Substantive arguments (1/6)

<u>Not yet heard</u>

- Users' PCs are vulnerable to viruses that can change vote without user knowing (e.g. man-in-browser)

- Man-in-the middle attack is possible

- Central server can also be compromised

- Massive fraud cannot be detected

- Secrecy of vote cannot be guaranteed

- A family member can easily impersonate and vote in place of another family member (also risk in old persons' homes)

Substantive arguments (2/6)
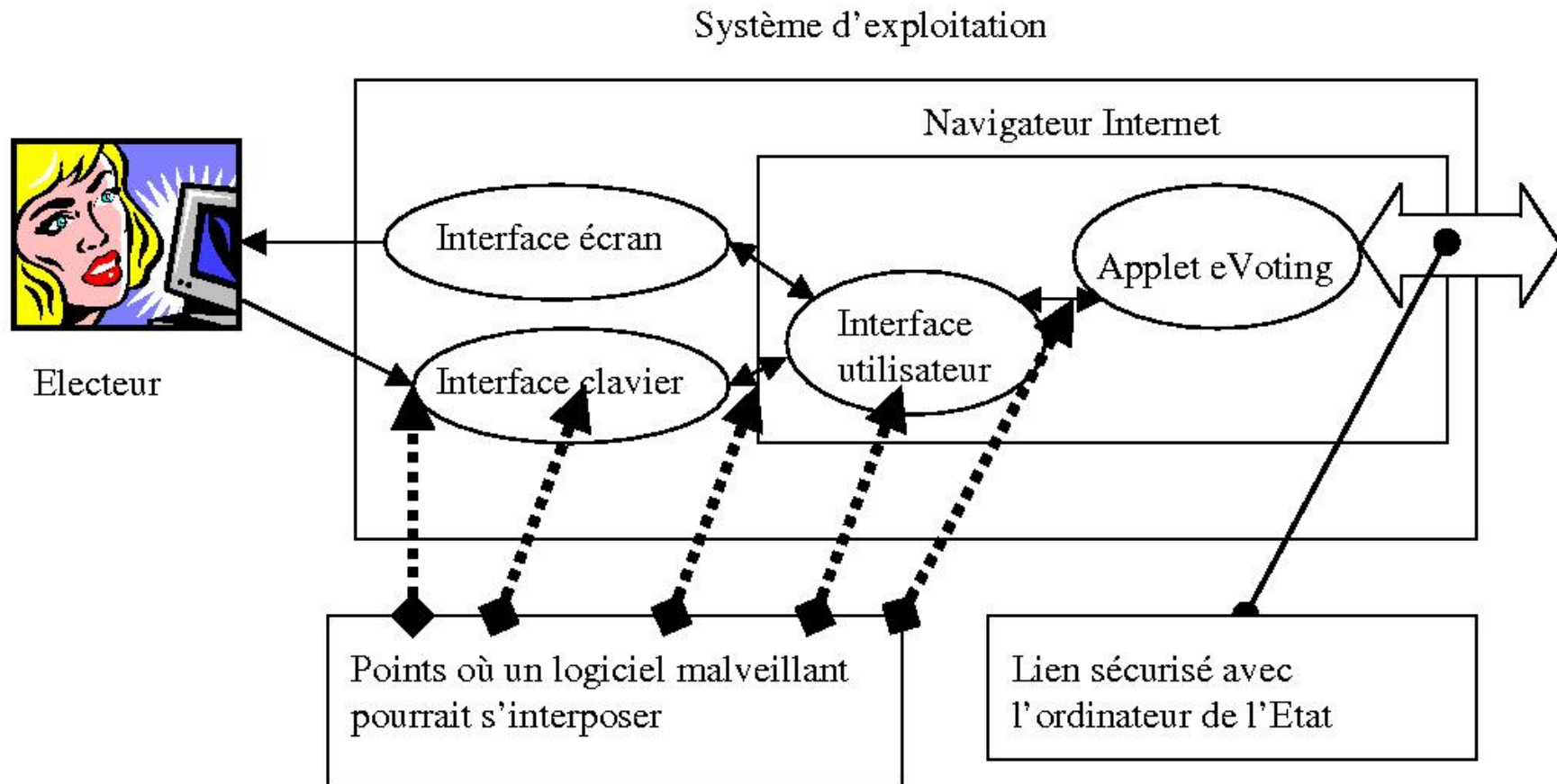
Not yet heard

- Geneva government did not produce security requirements called for in Geneva law

- Geneva government should suspend e-voting until security requirements are published

- The criticism is directed against the specific system used in Geneva, not against the principle, or the law, or the Geneva Constitution *(challenge to the law is time-barred)*
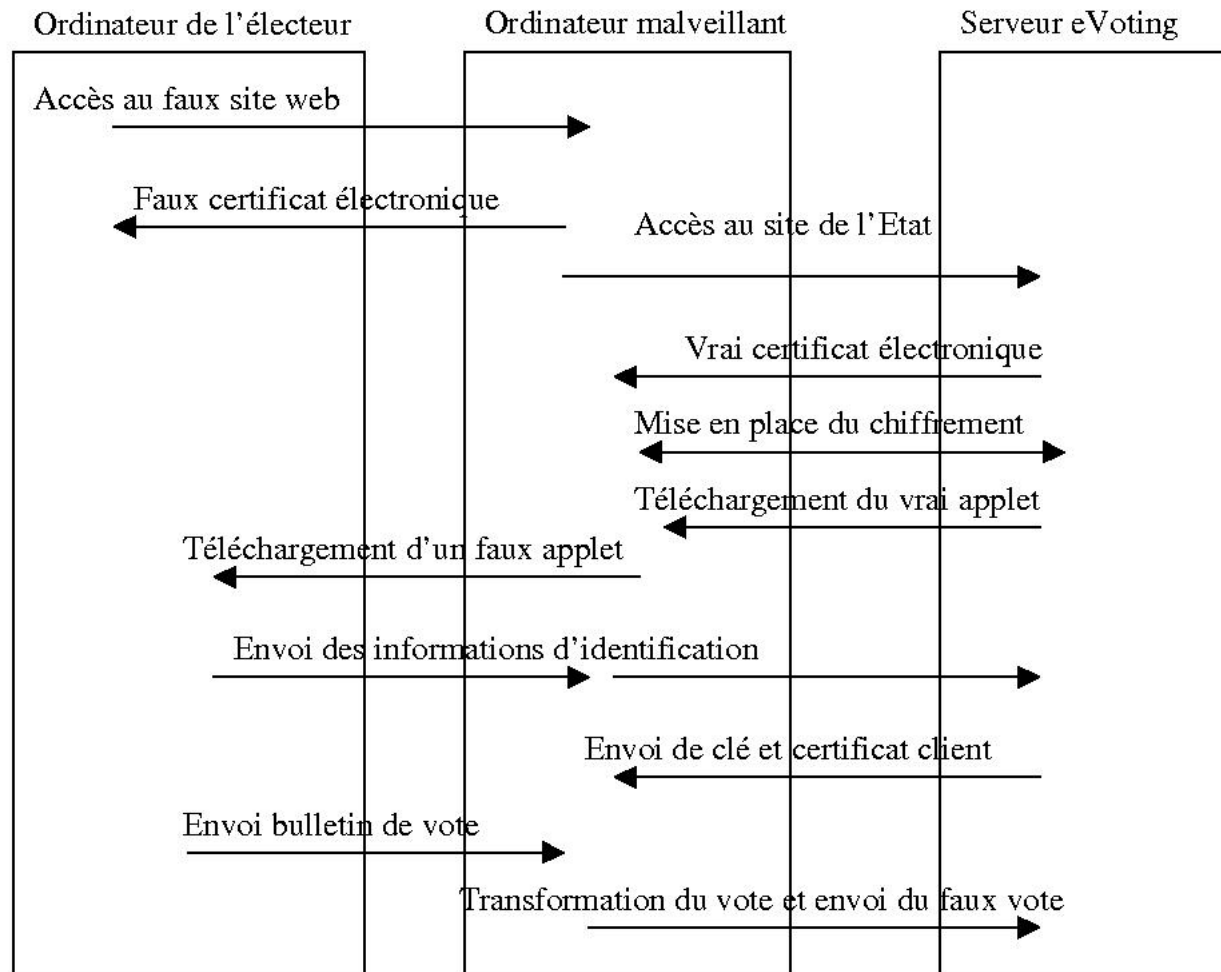
See ATA 533/2012 at http://justice.geneve.ch/tdb/Decis/TA/ata.tdb?F=ATA/533/2012

Substantive arguments (3/6)

Not yet heard

Substantive arguments (4/6)

Ordinateur de l'électeur   Ordinateur malveillant   Serveur eVoting

Accès au faux site web →

← Faux certificat électronique

Accès au site de l'Etat →

← Vrai certificat électronique

← Mise en place du chiffrement →

← Téléchargement du vrai applet

← Téléchargement d'un faux applet

Envoi des informations d'identification →

← Envoi de clé et certificat client

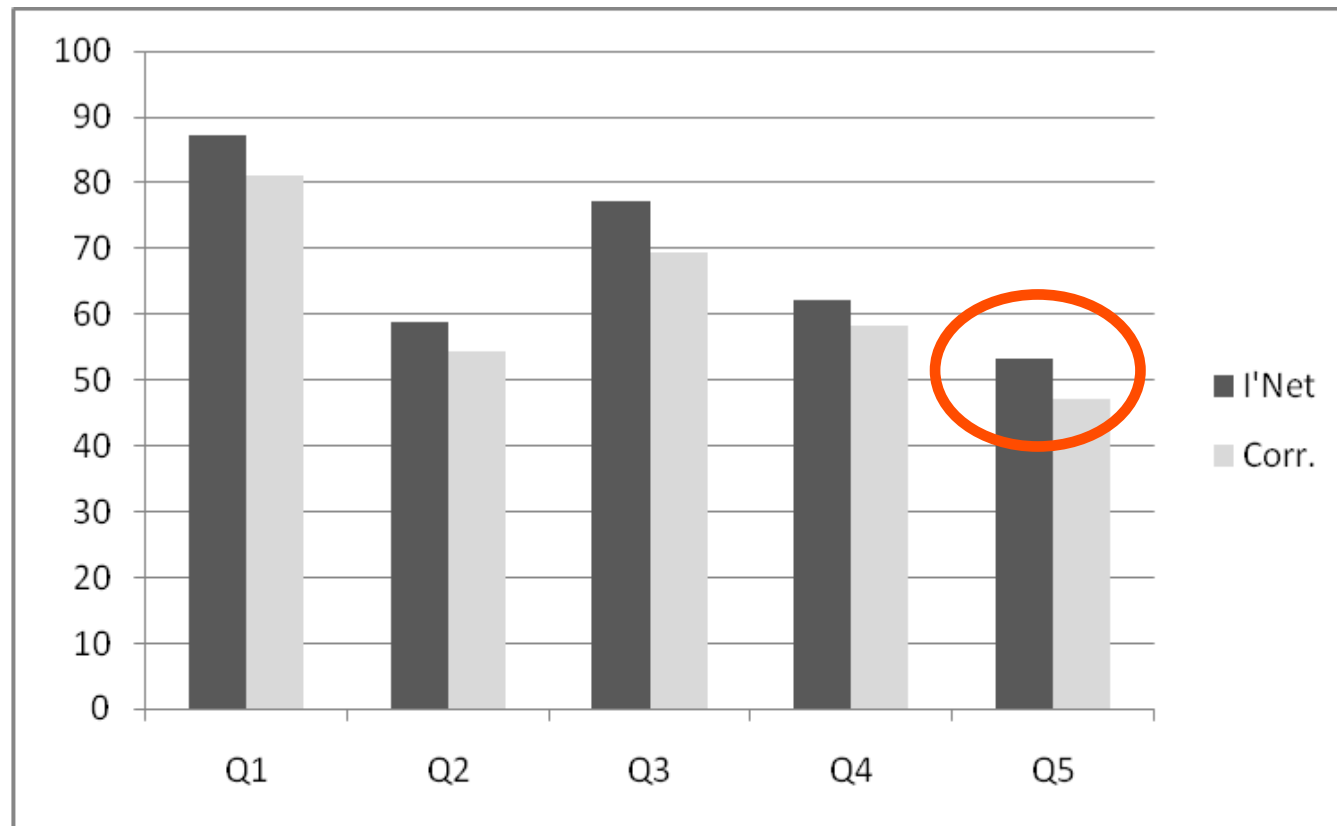Envoi bulletin de vote →

Transformation du vote et envoi du faux vote →

Substantive arguments (5/6)

15 May 2011 vote
by channel (e-vote and correspondence) and question

The difference for Q5 is statistically significant and unusual: in other votes there was no significant difference between the channels

Substantive arguments (6/6)

- Geneva IT specialist has demonstrated man-in-the-browser attack

- 2013 Federal government report calls for no extension of use of existing systems and development of verifiable voting systems (e.g. Norwegian approach)

  - But even this has vulnerabilities

See
- http://www.advtools.com/News/Post/index-UserKey=Attacking-e-voting-a-concrete-case-Nuit-du-Hack-2013.html
- http://www.bk.admin.ch/themen/pore/evoting/index.html?lang=fr
- Koenig, Locher, Haenni http://e-voting.bfh.ch/app/download/5945433661/FKLH13.pdf

The actual procedures (1/2)

1. Against 15 May 2011 voting method: irreceivable because too late (stupid mistake) – cost CHF 500

2. Against result of 15 May 2011 vote: irreceivable because in reality directed against method – <u>TF agrees</u> (restricted review) – cost CHF 500+1000+1000 (revision request)

3. Against refusal of Geneva government to suspend e-voting as requested by letter: irreceivable because not a decision subject to appeal – cost CHF 500

The actual procedures (2/2)

4. Against 27 November 2011 voting method:
    irreceivable because arguments abstract, general, and
    directed against principle of e-voting, not against
    Geneva system – TF disagrees: this is a question of
    substance, not receivability (cost 1500 not paid
    because won)

5. Since Geneva judges have evaluated the substance
    already, their recusal was requested:
    refused by Geneva – TF agrees *(cost 350+2000)*
    *but TF clearly states that arguments must be seriously
    evaluated (1C_563/2013)*

6. 27 November case remanded to Geneva by TF is
    pending judgment: witnesses were not called
    (cost 1500 if lose + TF cost)

Next steps

- If lose 27 November case, appeal to TF

- If lose at TF, point out to parliaments that there is no way to challenge the e-voting system in court, so they have to take responsibility for its security, and trade off:
  - Verifiability/secrecy
  - Useability/coded vote (or boot SW)
  - Cost/dedicated hardware (or boot SW)

Fully electronic system would be better for non-resident voters

References to cases

- 15 May 2011
  - ATA 414/2011
  http://justice.geneve.ch/tdb/Decis/TA/ata.tdb?F=ATA/414/2011
  - 1C_329/2011 and 1F_5/2012

- 27 November 2011
  - ATA 533/2012
  http://justice.geneve.ch/tdb/Decis/TA/ata.tdb?F=ATA/533/2012
  - 1C_477/2012
    - ATA 315/2013 and 1C_563/2013 (recusal)