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Open Source Remote Electronic Voting in Norway

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and Regional Development

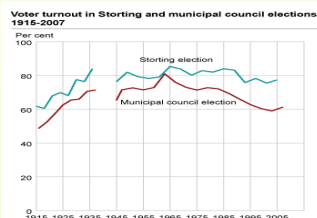


**BIST DU SICHER, DASS DEINE STIMME
RICHTIG GEZÄHLT WIRD?**

Project scope

- Why internet-voting
 - increase availability
 - reduce cost long term
- New central fully integrated voting administrative government owned and operated system(E/I/P-votes)
- Internet-voting from home/abroad in 2011 elections in in advanced voting period (Not election day)
- Use online electoral roll in polling stations
- Enable E-voting in poll stations for advanced voting (internet technology)

Facts on voting in Norway



- 3.600.000 in electoral roll
- Parliamentary and local every four years, offset by two years)
- Infrequent, non-binding referenda
- proportional electoral system where parties or lists win representatives according to their relative support in the electorate
- Voters can make changes to the ballot

Challenges in Norway

- Big debate on family voting from April
- Two municipalities (Oslo and Drammen) changed their mind and withdrew from the project
- Opposition in parliament (the conservative party) tries to stop internet-voting from home, but the government will go on as planned

What are Norway's advantages? (and prerequisites for e-voting?)

- Very high public trust
- Absolute trust in central election administration
- Relatively low level of political conflict

A basic premise for e-voting

One basic and all important premise for all electronic voting is that the public trusts the government not to conspire against it.

That having been said, the system should not require that no conspiracy against it exists within the government!

The Challenges of Remote e-voting in Norway

- Audit ability / transparency to the lay person
- The buying and selling of votes
- Coercion / family voting
- Home computer security
- Anonymity of the vote
- Attacks *scale*

Transparent e-voting?

- Complete openness and transparency in all aspects of the project
- Available source code
 - Unfortunately cryptography is really, really hard
- Cryptographic proofs of correctness
 - Even the voter gets one
 - The good thing about crypto is that it's all just math's
- Immutable logging of all system events



Transparent e-voting?

- Obviously open source won't make the system understandable to "everyone"
- ...and extensive use of esoteric cryptography makes things worse...
- ..but at least the lay person can choose which expert to trust.
- Besides, paper voting really isn't that transparent either!



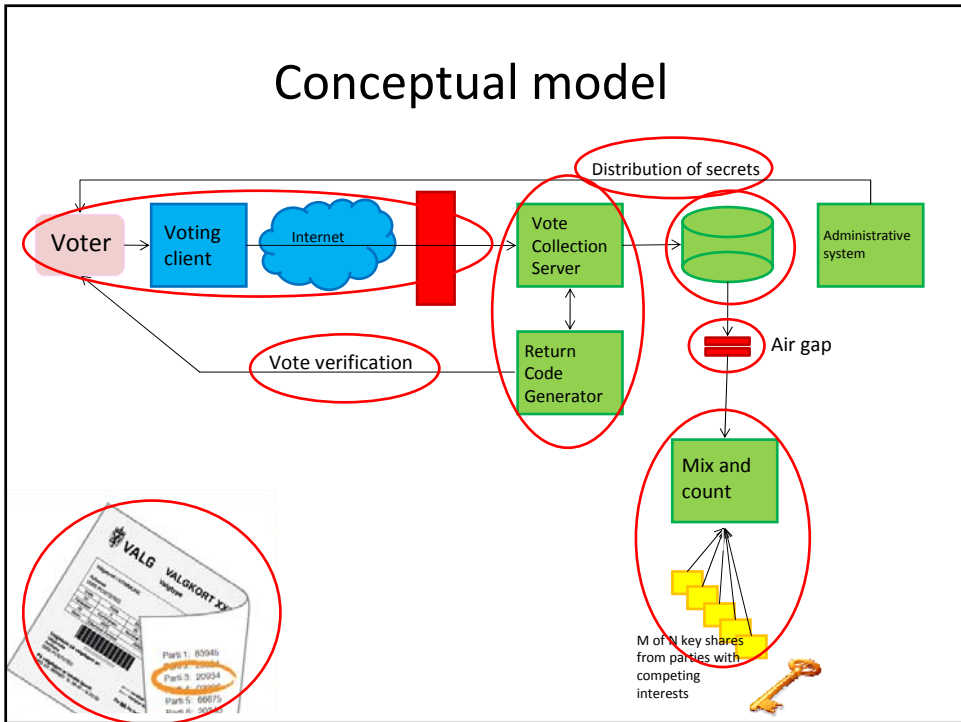
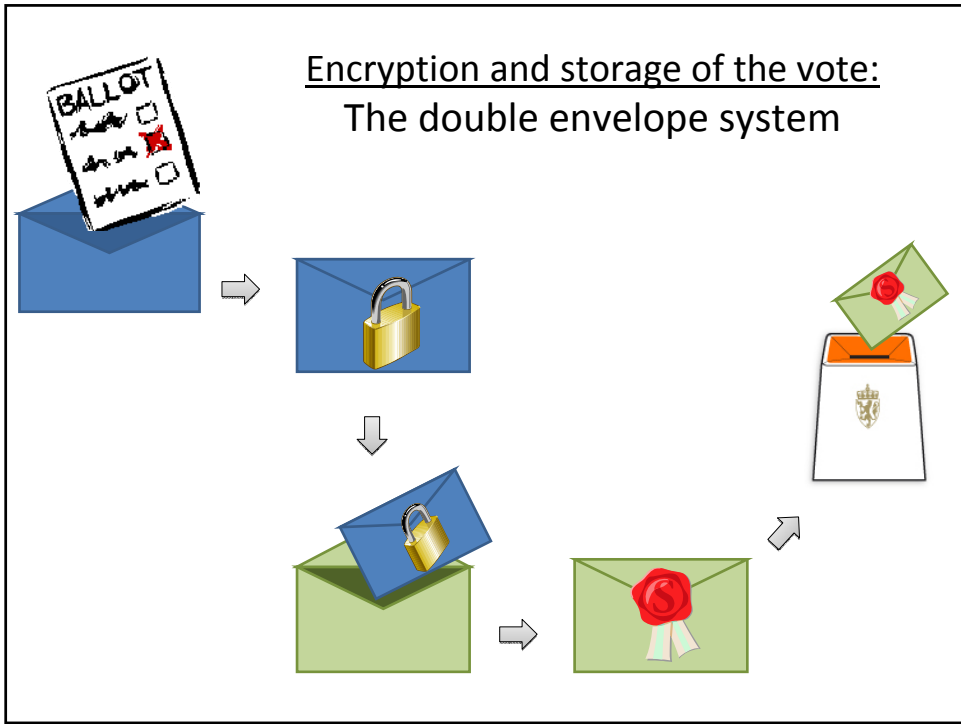
The Challenges of Remote e-voting

- Auditability / transparency to the lay person
- The buying and selling of votes
- Coercion / family voting
- ➔ • **Home computer security**
- **Anonymity of the vote**
- Attacks *scale*, and there are *externalities*

The voting process in Norway

We have copied and enhanced the Estonian method to fit Norwegian requirements

- Internet-voting for advance voting period
- You can e-vote as many times you want
- You can cancel your e-vote by paper-vote on election day
- This to prevent cohesion and buying/selling of votes



In conclusion – what we believe we've achieved i Norway

New approach to transparency

- A fully open source system
(you must be very clear in procurement process)
- Vote verification in remote e-voting by use of returncodes
- Near independence of client side (in)security (no-trust in client, we assume all personal PCs are
- Excellent auditability and verifiability
 - Can be improved upon by an N-version architecture
- Auditing combined with voter observation of returncode replaces the function of the observer in the polling station

Conclusion

We don't believe our system is fail-proof, but we believe the cost of hacking our system is greater than the possible gains

We see there are disadvantages by introducing e-voting, but we believe the democratic gain of better availability is greater than the disadvantage

If system fails or is hacked, we will have fallback to paper-voting on voting day (but if not detected we might have a wrong government)

Type of election planned	When	Scope	Voters in ER
Youth concil in Ålesund municipality	15-18 oct.	Internet from home	3400
Youth concil in BODØ municipality	Oct. 2010	Internet from home	4000
Non binding referendum in Vefsn	Oct. 2010	Internett + papir	10.500
Non binding referendum in Mandal	Nov. 2010	Internet from home	11.500
Non binding referendum in Sandnes	Nov. 2010	Internet + paper	1900
Non binding referendum in Hammerfest	Nov. 2010	Internet from home	7500
Non binding referendum in Bremanger	feb.2011	Internet from home	3000
Non binding referendum in Radøy	feb.2011	Internet from home	3500
Non binding referendum in Tynset	feb.2011	Internet from home	4100
Non binding referendum in Re	mar.2011	Internett+paper+scanning	6200
Local election 2011 in 10 municipalities. ADVANCE VOTING INTERNET	10 aug-12.sept. 2011	Internet from home+paper+scanning	160.000
County election 2011 in 10 municipalities ADVANCE VOTING INTERNET	10-aug-12.sept. 2011	Internet from home+paper+scanning	160.000
Parliament election 2013? If success in 2011 , roll out will be decided by parliament in 2012	2013-	Internet?+evote+paper+	3.600.00

For more information, see:
evalg.dep.no

The screenshot shows the website for the Ministry of Local Government and Regional Development. The main heading is "E-VOTE 2011-PROJECT". Below this, there is a sub-heading: "Valgere i 10 kommuner kan stemme elektronisk ved kommune- og fylkestingsvalget i 2011". A navigation menu includes "Ministry home", "Project frontpage", "About the e-vote project", and "Technical documents". A news section titled "NEWS" features a sub-heading "New version of the description of cryptographic protocol" dated [09.08.2010]. The news text states: "Kristian Gjosteen, from the Norwegian University of Science and Technology (NTNU), has described the cryptographic protocol that will be used in the trial with internet. You may find the full version of the protocol here." The website footer includes "LokalInternett" and "100%" zoom level.