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Outline

- Operation BRAVO Foundation
- ODBP Objective
- Operational Concept
- Security Overview
- Processes
- Project Team
- Discussion



Operation BRAVO Foundation

- **Administrative Framework for Overseas Voting Pilot Projects**
- **Private Funding**
- **Cooperation between:**
 - **Local Government**
 - **Industry**
 - **Academia**
 - **State Government**



Project Team

- Pat Hollarn (CERA), Supervisor of Elections
- Paul Lux, Assistant Supervisor, Okaloosa County
- Carol Paquette, project manager
- Election Trust, system integration
- ScytI Secure Electronic Voting
- SALT Laboratory, Florida State University
- Dr. Thad Hall and Dr. Michael Alvarez
- Sabrina McLaughlin (APR), public relations



Pilot Objective

To assess the effectiveness of using voting kiosks to improve voting access and preserve ballot secrecy for overseas voters.

By-mail, fax and e-mail voting methods are unreliable, not secure and can compromise ballot secrecy

20-30% of overseas military and civilian voters are disenfranchised by current by-mail process

Consistent with Okaloosa County experience



Operational Concept (kiosks)

- Voting kiosks and election staff placed at selected overseas distance balloting sites
- Diskless kiosks, software loaded from CD
- Kiosks connected to Okaloosa secure remote server via Virtual Private Network (VPN)
- Kiosk sites operate for 10 day voting period

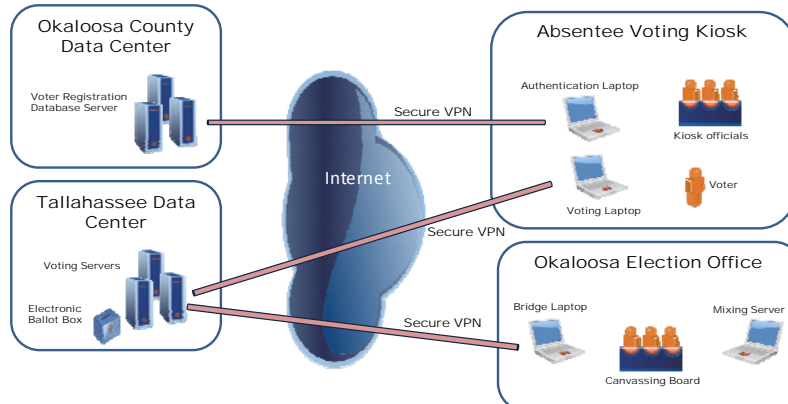


Operational Concept (voters)

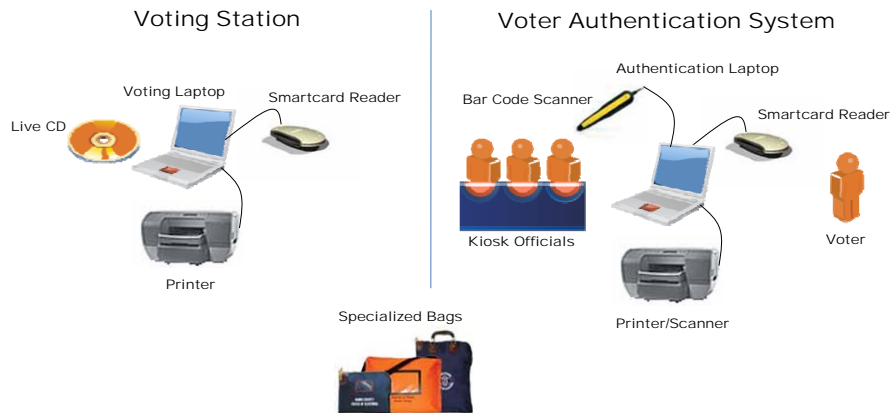
- 900 self-selected Okaloosa County voters
- Voter eligibility validated by on-site election staff
- Voter casts ballot with total privacy
- Digital ballot is encrypted, digitally signed and transmitted to Okaloosa secure remote server
- Voter verifiable paper ballot is printed, placed in a receptacle, and is returned to election central
- Voter receives “counted as cast” confirmation to verify inclusion of his/her ballot in the final tally



ODBP System Architecture



Absentee Voting Kiosk



Pilot Security Overview

End-to-End Security



- Okaloosa County:**
- Canvassing Board
 - Tabulation and canvassing
 - Storage of encrypted votes
 - Storage of all audit elements

- Remote locations:**
- Election staff
 - Clean voting kiosks
 - VPN routers
 - Web browser



Pilot Security Overview

- Ballot privacy
- Ballot integrity
- Voter verifiability
- Auditability

Protection against internal attacks

- Protection from Denial of Service
 - Protection from malware attacks
- } VPN, Voting Kiosks

Pnyx
CORE



Process I: Preparation

- Independent audit of voting and canvassing applications (which are digitally signed to prevent alteration)
- Extensive independent audit of voting kiosks
- Secure chain of custody management of voting kiosks
- Extensive testing of the voting system
- Generation of the Election Key Pair (Public Key and Private Key). The Private Key, used to decrypt ballots, is split and distributed in shares among Canvassing Board members through a cryptographic "secret sharing scheme"



Process II: Voter Enrollment

- Notification and promotion of project to potential voters
- Enrollment of pilot voters via electronic ballot request form
- Distribution of information and instructions to enrolled voters



Process III: Voting

- On-site election staff verify voter identification and eligibility
- Voter provided with unique digital certificate
- Voter uses secure voting kiosk to connect to secure server in Okaloosa to view ballot. Voter makes ballot selections and confirms selections via summary screen and paper record (if legally required)
- The confirmed ballot selections are then “wrapped” in a digital envelope and encrypted using the Election Public Key to protect voter’s privacy
- This digital envelope is then digitally signed using the voter’s unique digital certificate to protect ballot integrity and guarantee authenticity
- The cryptographically protected ballot is securely sent via VPN to the Okaloosa secure remote server
- Voter receives a “counted as cast” receipt that allows the voter to individually verify the inclusion of his/her vote in the final election tally



Process IV: Canvassing

- The Okaloosa secure remote server containing the encrypted ballots will be disconnected from the VPN and physically secured at the close of polls
- After the close of polls, the Canvassing Board meets to reconstruct the Election Private Key to decrypt the voted ballots. This requires the participation of a pre-defined number of Canvassing Board members
- Ballot decryption includes a mixing process to prevent any correlation between the ballots and the voters to protect voter privacy
- The Canvassing Board will prepare a combined tabulation report for all kiosk locations which will be incorporated in the final Okaloosa County tabulation report
- The list of the “counted as cast” receipts will be posted on the Okaloosa County website so pilot voters can verify that their electronic ballots were included in the final tally



Process V: Audit

- The “counted as cast” receipts contain a unique alphanumeric code known only to the voter. To prevent voter coercion and vote selling the receipts do not include the voter’s ballot selections
- Each voter can check whether his/her code is on the published list to verify that their ballot is included in the tally.
- Every activity of the server is logged using patented, encrypted chained logs. Any unauthorized change, addition, or deletion made to the log is detected.



Summary - This is a Pilot

- Improve election accessibility to overseas voters
- Remote absentee voting
- Hardened, elections official controlled kiosks
- Virtual Private Network
- Cryptographic paradigm voting system
- Verifiable at both vote cast and tabulation
- Paper record retained for audit
- Every ballot will be audited



Questions?

BRAVO

Bring Remote Access to Voters Overseas

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AA: Applicable Acronyms

- OBF: Operation BRAVO Foundation
- ODBP: Okaloosa Distance Balloting Pilot
- UOCAVA: Uniformed and Overseas Citizens Absentee Voting Act
- OVF: Overseas Vote Foundation
- EAC: Election Assistance Commission
- FVAP: Federal Voting Assistance Program

