Best Practices For Maintaining Voting Systems Audit Logs
June 1, 2010

Background

In December 2007, Humboldt County elections officials learned that a problem with its voting system resulted in the unintentional deletion of 198 votes. In the course of an investigation by the Secretary of State's Office of Voting Systems Technology Assessment (OVSTA), additional problems were discovered in the audit logs of the voting system there. Following this discovery, the Secretary of State requested specific audit log information from each voting system vendor with a system approved for use in California. The Secretary of State then engaged an independent computer science expert to analyze the audit logs of each of the voting systems based on their documentation, design and implementation, and make recommendations about actions the Secretary of State may wish to consider taking.

Findings

The independent researcher who conducted the Voting Systems Audit Log Study reported finding deficiencies in the audit log features of all approved voting systems and identified possible mitigations specific to each system. OVSTA analyzed the findings and the mitigations to determine which of them could be quickly implemented, provide the greatest benefit to the public, while allowing local elections officials to continue to use the voting systems they had purchased.

Mitigations

Based on the findings in the researcher's report, the Secretary of State prepared a list of recommended best practices county elections officials should implement to protect their voting system against the loss and destruction of the significant information stored in its audit logs. The mitigations listed are not specific to each voting system, but instead can be used with any voting system. The primary goals are to preserve and archive the audit logs so they are available for audits, recounts, election contests and forensic purposes.

All of the listed mitigations have been discussed in detail with each voting system vendor that has a system approved for use in California and have been reviewed by the county elections official in at least one county that uses the vendor's voting system.

The Secretary of State has required each voting system vendor to include specific instructions for implementing the mitigations in future revisions of its mandatory California Use Procedures.

Best Practices

File location and retrieval
Each county elections official should require the county's voting system vendor to provide a list of all audit log files, the file location within the voting system, and the procedures to navigate to and retrieve them from the voting system. This information should be maintained in each county's standard election practices and procedures documentation.

Protective measures
Each county elections official should protect the audit logs from possible intentional or unintentional erasure or alteration. This is voting system specific. Each county elections official should work with the county's voting system vendor on the specific steps needed to maintain the integrity of each voting system's audit logs.

Prohibited practices
Each county elections official should include information in the county's standard election practices, procedures and training material about specific prohibited practices that could result in destruction of audit logs.

Back up and archive
Each county elections official should back up and archive all audit logs in their native electronic form, even if they are saved in a proprietary format. However, if the native form of the audit logs is a paper record, and there is not a way to maintain an electronic copy, each county elections official should make sure that the archived copy is a clean, unaltered, readable copy that can be examined, if necessary, at a later date.

Make audit log information user friendly
Each county elections official should export audit logs in formats suitable for use by elections officials and the public. If the audit log may only be exported and saved in a proprietary format, the county elections official should maintain a list of procedures, to be used when needed, on how to import the information back into the voting system component, from which it was exported, so that it may be printed out in a human readable format.

Retain copies
Each county elections official should maintain a copy of all audit logs for the mandated 22-month retention period following each election.