



**Review of Butler County
March 2008 Primary Election
Issues**

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Executive Summary

Butler County experienced two issues during the March 2008 Primary.

Both issues were related to the process of vote tabulation and were identified during the normal checks and balances carried out by Butler County during the election. These anomalies did not affect the final election results.

An investigation of the election logs and the voting system source code has not revealed a definitive root source for the issues, which have not recurred and which Premier was unable to replicate in its testing laboratory.

A speculative root source might be the interaction between the voting system and certain external anti-virus software installed on the server.

Moving forward, Premier will make adjustments to its system that will minimize the effect that this external anti-virus software has on the voting system. In addition, Premier will provide additional information to election officials and workers to help guide them should similar issues ever recur. In an upcoming Product Advisory Notice, Premier will remind operators of the system that they should be reviewing the "AccuVote-TS Status", and the "AccuVote-OS Status" reports within GEMS, to ensure all memory cards have been uploaded. These measures will not only readily identify any such occurrences of the event evidenced in Butler County, but also detect any procedural or operational errors that may have occurred.

Overview

During the March 2008 Primary Election, Butler County experienced two unexpected issues with the Global Election Management System (GEMS) software. The first occurred during the upload of the unofficial results, and again, during the upload of the official count. During the unofficial upload, GEMS reported that all memory cards were uploaded. However, a review the next day indicated that one memory card was not uploaded. A review of the poster log showed one "Sharing Violation" error. This same issue happened during the upload of the official count, but to a memory card from a different vote center.

The second issue occurred during the recount when the absentee ballots were being counted. Two of the machines reported a "Lost DSR" error. In addition, a "Deck Already Committed" error was displayed to the system operator. The operators misunderstood the message, and since the system showed a committed deck with the ID of the deck being processed, they assumed there was no problem

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and did not re-feed the deck. During the audit of the central count it was determined that two decks were not accounted for and a review of the audit log showed the errors. When the two decks were processed, the ballot count audit matched.

Butler County has requested that Premier Election Solutions analyze these two issues to determine the source of the problem.

Review

Premier Election Solutions provided Butler County with a list of information that would allow the company to perform an initial review. The information requested included files, logs, process lists, services lists, and sample control cards that were used during the election.

This information was collected by the county, with representatives of the state present, and received by Premier Election Solutions on April 30, 2008. Premier software developers have reviewed this information and performed a detailed analysis of the source code in order to investigate and understand the source of the problem.

It's important to note that a number of the third party log files contained no readable data. Unreadable log files included:

- AccessProtectionLog.txt
- BufferOverflowProtectionLog.txt
- OnAccessScanLog.txt

For example, AccessProtectionLog.txt file is three bytes, all spaces. It is possible the files were corrupted somehow, but it is more likely they simply do not contain useful data to analyze.

The Sygate related log files did not contain any information related to the file system, or any other data that would explain the sharing violation. They were entirely network related.

The services running were reviewed and, with the exception of McAfee Framework Service, nothing was out of the ordinary; similarly for the list of running processes.

The GEMS logs were all present and well-formed.

Sharing Violation Issue

Upon review, none of the logs revealed why the poster "Sharing Violation" occurred initially. Note that the poster caught the error on the single file and then immediately processed the queue without interruption. The GEMS system was not shut down, and there was no evidence of malfunction before or after that point. There was nothing unusual in the AV Server log.

There have been reports of on-access scanning anti-virus software causing sharing violations for other third party products. However, Premier Election Solutions has never experienced this issue with its products neither during other internal testing situations nor during review of other elections.

Moving forward, Premier Election Solutions will enhance the system to automatically recover from this error condition and to make non-recoverable errors more visible to the operator.

Central Count Issue

With respect to the central count issue, the logs were reviewed and Premier Election Solutions has determined there was an issue with the assignment of the deck identifiers by the GEMS system. A similar issue had been reported before but was believed to have been caused by the use of incorrect control cards and operator error. In the previous report, the county was using sequenced Precinct Header Cards while Butler County was using generic deck header (“Batch Start”) cards. In the Butler case, the message “Error: Deck already committed” caused confusion. Because of this message, the deck was not re-processed as it should have been.

A detailed review of the code and error logs has not revealed a root cause of this problem. Premier Election Solutions is setting up an extensive test bed to exercise the system. However, the GEMS system did detect the error and provide the operator with an error message, which is a correct functioning of the system’s built-in safety checks.

Premier Election Solutions will enhance the error reporting to clarify the need for the operator to re-feed the deck.

Conclusion

Premier Election Solutions has reviewed the information provided by Butler County to investigate and determine the root cause of two issues that occurred during the March 2008 Primary election. Both issues were detected during the normal post-election processing conducted by Butler County. Because the county followed these normal safety checks, the two isolated issues did not affect the election results.

Our detailed analysis of the information provided by Butler County and the source code has not revealed the root cause of the problem. A possible source of the first issue is an interaction between the on-demand anti-virus software and the GEMS system.

Premier Election Solutions will enhance the GEMS system to better handle the sharing violation issue and to provide clearer information to the operators about potential issues that might arise during operations.

As a final note, Premier Election Solutions reminds jurisdictions that conducting a proper election canvas is an essential part of the election process and serves as a check and balance to detect and correct any potential errors found.