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# **DOMINION VOTING SYSTEMS**

## **ADJUDICATION 2.4.1.14601 MODIFICATION**

### **Staff Report**

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# **I. INTRODUCTION**

## **1. Background**

On December 30, 2014, Secretary of State Debra Bowen conditionally approved the Dominion Voting Systems (Dominion or DVS) Democracy Suite 4.14-A.1 with Adjudication 2.4 voting system. The system was conditionally approved because of a finding in the Adjudication 2.4, specifically version 2.4.1.3201 component, which improperly permits an adjudication judge to inadvertently and erroneously change vote selection while maneuvering the ballot image during the ballot resolution process. Further, Dominion recognized the deficiency and developed an updated version of the software, Adjudication version 2.4.1.14601, to prevent adjudication judges from inadvertently and erroneously changing a vote selection.

## **2. Scope**

This report presents the test results for the two phases of the certification test campaign of the Dominion Adjudication 2.4.1.14601 modified component. The purpose of the testing is to verify that the modified component fixed the problem in the Adjudication 2.4.1.3201 component that was identified in the Secretary of State's Staff Report and Conditional Approval of the Democracy Suite 4.14-A.1 with Adjudication 2.4 voting system. Further, pursuant to Elections Code section 19216, the testing shall verify that the modification does not impair the accuracy and efficiency of the voting system.

## **3. Summary of the Application**

Dominion submitted an application for an update to the Adjudication component of the Democracy Suite 4.14-A.1 voting system, which was conditionally approved on December 30, 2014. The updated Adjudication component contains the following software:

- Adjudication Client version 2.4.1.14601; and
- Adjudication Services version 2.4.1.14601

In addition to the software, which includes the executable code and the source code, Dominion was required to submit updated California Use Procedures.

# **II. SUMMARY OF THE MODIFICATION**

In order to create the new Adjudication 2.4.1.14601 component, Dominion made changes to the following six files:

1. Product.wxs - Windows Installer XML file;
2. DVSVerisign.pfx – Personal Information Exchange certificate;
3. DVSVerisign.pfx – Personal Information Exchange certificate;
4. DVSVerisign.pfx – Personal Information Exchange certificate;
5. BallotViewer.xaml.cs – source code file

#### 6. AssemblyInfo.cs – version information file

All six files were components of the Adjudication Client application. No changes were made to the Adjudication Services file. However, because of the build process, it had to be re-compiled and therefore, received a new version number as well.

### **III. TESTING INFORMATION AND RESULTS**

#### **1. Background**

During the conduct of the Dominion Democracy Suite 4.14-A.1 with Adjudication 2.4 voting system certification testing, issues were discovered and then mitigated procedurally. However, there was one issue that could result in an adjudication judge inadvertently and erroneously changing vote selection while maneuvering the ballot image during the ballot resolution process. The issue was described in the Staff Report for the Dominion Democracy Suite 4.14-A.1 with Adjudication 2.4 voting system as follows:

*Maneuvering a ballot image in the Adjudication application may cause an erroneous vote selection. The only way to scroll the ballot up, down, left, and right to go from contest to contest is by using the grab function (represented by the Hand icon) in Adobe. This causes the user to have to physically move the ballot on screen by grabbing a spot on the ballot. However, if the user grabs the ballot in the area of a vote target, the application selects or deselects the vote position where the ballot was grabbed. In multiple instances a vote was accidentally and erroneously given to a candidate for whom a vote was not intended. The application does give a color-coded notification (Green for vote selection, Red for deselect) across the top of the screen that appears for five (5) seconds, but it is easily overlooked as the user is searching for the exception on the ballot that needs to be resolved. Dominion added a procedure to the California Use Procedures stating that the user should only maneuver the ballot image along the left or right timing marks. Later, it was discovered that this new procedure would not work either because there is an approximately two-inches (2”) of dead space on the left-hand side of the application screen. Therefore, the California Use Procedures were again amended to state that the scrolling of the ballot image should be “in an area that does not contain voting targets...” It further explains that the best area to select is the center of the ballot in the second column.*

On January 2, 2015, Dominion submitted an application for a modification to the Democracy Suite 4.14-A.1 voting system that was conditionally approved on December 30, 2014. The application contained two modified components; 1) Adjudication Client version 2.4.1.14601 and 2) Adjudication Services version 2.4.1.14601. With the application, Dominion also submitted an updated California Use Procedures document.

## **2. Voting System Testing Laboratory Results**

NTS, the federal EAC accredited voting system testing laboratory (VSTL), which conducted the source code review and software compile for the Adjudication 2.4.1.14601 trusted build, submitted its source code review analysis report to the Secretary of State on January 14, 2015. The review conducted by NTS concluded that the modified code for Adjudication 2.4.1.14601 contained six modified files, only one of which was a source code file. The source code was determined to be clean and compliant with the Voluntary Voting System Guidelines (VVSG) 2005. Compliance with VVSG 2005 is easily traceable and verifiable. However, the definition of clean code is subjective and open to interpretation. Therefore, OVSTA worked directly with the source code review team at NTS to get further clarification and substantiation. Based on those discussions, OVSTA determined that the code, including of the comments, was easy to understand, easy to test, and provides sufficient information and clarification to allow the code to be easily modified in the future, if required.

From the code base, NTS created a trusted build of both Adjudication 2.4.1.14601 applications; Adjudication Client and Adjudication Services. The trusted build was compiled utilizing the build documents provided with the voting system technical data package. Further, included in the trusted build compilation was a process for obfuscating the code. A copy of the trusted build software and source code for both Adjudication version 2.4.1.14601 applications was provided to the Secretary of State directly from NTS.

NTS was not contracted to perform any functional testing.

## **3. Functional Test Results**

OVSTA conducted a functional test to determine whether the Adjudication 2.4.1.14601 software corrected the issue that was discovered in the conditionally approved version (Adjudication 2.4.1.3201). The software modification worked as intended. Therefore, Adjudication version 2.4.1.14601 will prohibit an adjudication judge inadvertently and erroneously changing vote selection while maneuvering the ballot image during the ballot resolution process.

OVSTA performed a complete rebuild of the Dominion Democracy Suite 4.14-A.1 voting system in accordance with the Install Procedures. The only change that occurred from the original install was the use of the Adjudication 2.4.1.14601 trusted build application software, instead of the old version of the software (Adjudication 2.4.1.3201).

The testing was conducted utilizing the General Election definition database that was used in the original Dominion Democracy 4.14-A.1 voting system certification test campaign. This allowed the reuse of the ballots that had been marked, including exception ballots to be resolved through Adjudication, from the previous testing. Therefore, the pre-defined election definition was loaded onto the voting system through the restore process, defined in the California Use Procedures.

Ballots were scanned through the ImageCast Central (ICC), including exception ballots that were electronically outstacked into the Adjudication Client application. Three separate Adjudication Clients were running simultaneously, using three separate accounts with different roles and permissions. The role/permission and computer for each respective account is listed below:

1. EMSServer – emsadmin, administrator role with full control on all DVS applications;
2. EMSWorkstation1 – AdjUser, administrator role with full control in Adjudication Client only; and
3. EMSWorkstation2 – AdjUser2, user role with permission to resolve ballots only in Adjudication Client.

During the resolution process, under each respective account, OVSTA verified that the new software prohibits an adjudication judge inadvertently and erroneously changing vote selection while maneuvering the ballot image during the ballot resolution process.

After resolving all exception ballots in the Adjudication Client, the emsadmin, on the EMSServer, accepted the ballots as resolved and electronically pushed them on to be tabulated and reported in the Results Tally Reporting (RTR) module. All of the results from Adjudication were validated and published. A statement of votes cast report generated and the vote totals were verified.

The application performed as intended and did not allow an adjudication judge to inadvertently and erroneously change vote selection while maneuvering the ballot image during the ballot resolution process. Further, it was determined that the new software did not impair the accuracy and efficiency of the voting system. However, the following two issues did arise during the Functional Test.

### **Issue with Installation**

During the install one error was discovered when installing the commercial off the shelf anti-virus software, avast! Pro, on two of the three workstations (EMSWorkstation1 and ICCWorkstation). The error message was generated during the install of the avast! update file, vpsupd.exe, which occurred after the successful install of the avast! Pro software. The error message was as follows:

*“Setup is already running. Please try to start the setup later.”*

When the error message was first received on the EMSWorkstation1, the process could not be stopped. Multiple tries to stop the process through the task manager were unsuccessful and the system had to be rebooted. After a second unsuccessful install of the vpsupd.exe file, it another attempt to stop the process through the task manager created a system freeze. At this point, the system was again rebooted, the avast! Pro software was uninstalled, and the system was rebooted a third time. The install of avast! Pro was performed in its entirety a second time. After that install, OVSTA waited

approximately five minutes between the completion of the install of avast! Pro and the running of the update file. The updated installed successfully.

Similarly, on the ICCWorkstation, the avast! Pro software was installed and OVSTA waited three minutes before running the update file. This again caused the identical error. However, this time there was not a system freeze or need to stop the process, OVSTA solely launched the vpsupd.exe file a second time. This attempt was installed successfully.

During the install of the vpsupd.exe file on the EMSWorkstation2, the error was not observed. However, there was an eleven minute delay between the time in which the avast! Pro software was installed and the vpsupd.exe file was executed.

Although a root cause has not been determined by Dominion, it is suspected, based on the error message language and the results from the testing, that the error is a function of avast! Pro software continuing to run background processes even after the successful install message has been displayed. Therefore, it is the recommendation that Dominion update the Install Procedures to notate that the vpsupd.exe file should not be run immediately following the install of avast! Pro; there should be at least a five minute lag time.

### **Issues with Adjudication Client**

Two issues in the Adjudication Client arose during testing. However, both issues were notated in the original testing of the Adjudication 2.4.1.3201 and reported in the Dominion Democracy Suite 4.14-A.1 with Adjudication 2.4 Staff Report. This section is to reiterate that the modified Adjudication version 2.4.1.14601 has not addressed these outstanding issues. The following paragraphs are direct excerpts from the Staff Report describing the issues.

*While resolving ballots through the Adjudication Client, the client erroneously sat in the "Waiting for ballot" state. This normally occurs only when there are no additional ballots that need to be resolved. However, in multiple instances there were ballots waiting in queue that were not making it to the client. A procedural workaround was added to the California Use Procedures that corrects the issue. The workaround is for the Administrator to log onto the Administration Adjudication application and "Refresh" the application.*

*[I]t was discovered that this new procedure would not work either because there is an approximately two-inches (2") of dead space on the left-hand side of the application screen.*

In addition to the approximately two-inches (2") of dead space on the left-hand side of the application screen, this testing showed that there is a similar issue with the approximately two-inches (2") of space across the top of the application screen.

## **IV. CONCLUSION**

The modified Adjudication software version 2.4.1.14601 performed as intended, prohibiting an adjudication judge from inadvertently and erroneously changing a vote selection while maneuvering the ballot image during the ballot resolution process. The modification to the Adjudication component did not impair the accuracy and efficiency of the conditionally approved Dominion Democracy Suite version 4.14-A.1.