



U. S. ELECTION ASSISTANCE COMMISSION
VOTING SYSTEM TESTING AND CERTIFICATION PROGRAM
1335 East West Highway, Suite 4300
Silver Spring, MD 20910

October 1, 2020

Sent via e-mail

Re: ExpressVote 1.0 Trusted Build

Dear State Election Directors,

On September 23, 2020, the U.S. Election Assistance Commission (EAC) was notified by the Texas Secretary of State's (SOS) office that they discovered a hash value discrepancy with a voting system they were examining for certification, ES&S EVS 6.0.3.0. This hash value discrepancy was discovered on ExpressVote 1.0 when the Texas SOS staff exported the software files from the installation USB drive and the installation files from the trusted build and imported them into a 3rd party software tool, Ubuntu, which compared the two hash values and displayed the mismatched hash value.

It's important to note in this case that the states and their jurisdictions wouldn't have seen an automated hash value error displayed on the screen as there are two separate load processes, which makes it impossible to allow for the system to compare the two hashes and display an error message. Discovering the hash value discrepancy would require a manual process of comparison by reviewing the hash value from the Inno disk (inside the unit) which loads the entirety of the installation (all files), to the hash value from the USB drive (as it only loads the firmware).

Texas SOS representatives and ES&S representatives determined this validation error existed in EVS 6.0.2.0 as well. Both versions are certified by the EAC to VVSG 1.0 and EVS 6.0.2.0 is currently deployed in 43 counties in Texas. 18 of the 43 counties use a configuration of EVS 6.0.2.0 that includes the ExpressVote 1.0.

As part of EAC certification, manufacturers are required to submit system identification tools and procedures that use hashes to prove that the applications installed on a voting system exactly match the certified versions. ES&S explained that only one file was causing the hash validation error, a bitmap image file (SYSLOAD.BMP) with a copyright date that displays on the ExpressVote while booting up. ES&S further explained that the issue occurs only if a USB update method is used to update the version of the ExpressVote unit from a previous version. The reason the update method causes the issue is due to the fact that the USB drive is a quick installation method that is designed to ONLY update firmware, and because the bitmap file is not part of the firmware, the installation via the USB drive method didn't replace the bitmap file and left the old bitmap file on the system resulting in the hash discrepancy.

Texas contracted with the voting system test laboratory (VSTL) Pro V&V to verify ES&S' claim that the SYSLOAD.BMP file was the only change to the certified trusted build. Pro V&V performed a source code comparison of the EVS 6.0.2.0 update image disk file and the EVS 6.0.2.0 production release disk image file. Pro V&V confirmed that the only change was a bitmap file. Pro V&V upgraded an ExpressVote from EVS 5.2.2.0 to EVS 6.0.2.0, received a hash mismatch message as expected, and

performed functional testing on the upgraded ExpressVote. Pro V&V concluded that the hash mismatch error does not impact the functionality of the ExpressVote. Pro V&V's test report is attached to this letter.

Initially, we were under the impression that only EVS 6.0.2.0 systems in Texas were impacted. We requesting information from ES&S to better understand the scope and to date have received information that the states listed in Table 1 have at least one jurisdiction that may be affected. Please note that this information is current as of October 1, 2020. We will provide updated information as soon as it is received.

Table 1

State	# of Units	Status
AL	105	Potentially affected
AR	2072	Potentially affected
AZ	496	Potentially affected
DC	102	Affected
FL	2893	Potentially affected
IA	532	Potentially affected
ID	346	Potentially affected
IN	731	Potentially affected
KS	1742	Potentially affected
KY	400	Affected
MD	3501	Likely unaffected
MI	548	Potentially affected
MO	538	Potentially affected
OH	168	Potentially affected
TN	671	Potentially affected
WA	3	Potentially affected
WI	667	Potentially affected
WY	20	Potentially affected

On September 29, 2020, we sent the following request to ES&S:

"In order to be in compliance with our Testing and Certification Program, we are requesting the following information. We may request additional information, and expect that you will disclose any other information that would assist us in understanding the scope of impact of any ES&S voting system regarding compliance with EAC certification.

1. The total number of jurisdictions throughout the United States affected including the jurisdiction name, contact information, and a list of affected devices including the system version information as well as serial numbers in each jurisdiction and when the installation occurred by ES&S personnel.

2. A detailed document providing a timeline of when this issue was first known and what ES&S is doing to remediate the issue.
3. All communication with the VSTLs regarding this issue.
4. An advisory notice specifying each EAC-certified voting system that uses the ExpressVote 1.0 and the ExpressVote's certified hashes and the mismatched hashes generated from the "update" file that has been installed on fielded devices.
5. All communication to the affected jurisdictions must represent the real facts regarding the circumstances.
6. Submit all documentation that supports your position regarding what you feel occurred.
7. A detailed document describing why ES&S disagrees with some of the statements the Texas Secretary of State's office made in their letter to ES&S dated September 24, 2020.
8. ES&S' plan to install EAC-certified software on the affected ExpressVotes in Texas.
9. ES&S' plan to install EAC-certified software on affected ExpressVotes as requested by jurisdictions.
10. ES&S' planned resolution, including a documented procedure, to ensure that this does not occur again.
11. ES&S' communication plan and any other documentation (timeline, FAQs) that will be distributed to the affected jurisdictions for review and approval by the EAC.
12. ES&S will communicate directly with the Executive Director or her designated representative and will cease to contact EAC employees throughout the duration of this investigation.

Finally, according to Section 5.15.4 of the Testing and Certification Program Manual, a manufacturer has 15 days from receipt of this letter to comply with the recommended corrective actions. However, due to the urgent nature of this issue and its impact on fielded, EAC-certified voting system 35 days before the 2020 General Election, we are requesting this information by close of business on October 1, 2020. We anticipate you immediately provide a written advisory of the situation to the states and localities impacted by this issue. We are requesting you utilize additional personnel and expend whatever resources necessary to install to provide an appropriate validated hash on identified EAC certified voting systems, resolving the issue upon request of the states. The EAC anticipates that we will review and re-test the software with incorrect hash validation in our accredited laboratories in the coming days and weeks. We anticipate your cooperation with this matter and working with the states and localities using the identified systems.

ES&S needs to be prepared to cooperate with the labs and EAC to provide complete test reports on each of the builds of different versions among the states that have an incorrect hash validation - so we have a complete record of testing results that confirms there is not any impact to accuracy, functionality, use, etc.

Failure to comply will result in the EAC taking immediate required action as it deems appropriate as the system no longer complies with its original certification, including but not limited to initiating decertification actions and/or suspension of manufacturer registration.

We are taking this matter very seriously and understand that ES&S does as well and appreciate a prompt response given the nature of this issue."

We will request that ES&S submit all update image files and voting system configurations to VSTLs for examination via our de minimis change process. Table 2 displays all affected EVS voting systems, firmware versions, and hash values of the production trusted build.

Table 2

EVS Release	FW Version	Copyright YRS	Hash Value
FL EVS 4500v4	1.2.3.0	2011 - 2013	f67dbc52fe9c5e65ad786740ca07388e864fc00aaabcb6e0169b44c485356101
EVS 5200 EVS 5300 EVS 5303 IL EVS 5300 EVS 5201 EVS 5202 EVS 5203 EVS 5204	1.4.0.0	2011 - 2014	e173f1a084bb5fac2e19962aeb4f6ecd529e30cc9b0a64411cda80e4b4089686
EVS 5210 EVS 5310	1.4.1.0	2011 - 2015	de99ddc620c6260e5e4dd4d26486b82f8a5c2297fc5169b31607b61563f974de
EVS 5211	1.4.1.1	2011 - 2016	b3a230dc5ff31311a9f83b5bfee22ac96291c57f0c84abd05852aabf605ebbe3
EVS 5220 EVS 5320	1.4.1.2	2011 - 2016	b3a230dc5ff31311a9f83b5bfee22ac96291c57f0c84abd05852aabf605ebbe3
EVS 5321 EVS 5230 EVS 5330	1.4.1.6	2011 - 2017	ff4c1b668dbdale7b23ba41547c62b53385afc836fd60717bc04739d9383b2aa
EVS 5240 EVS 5340 EVS 5241 EVS5341	1.4.1.7	2011 - 2018	07015a3e4d71e8683d3bf21b3d427f007a89b35d236767aedd35c4d94c3d8a12
FL EVS 4520v1	1.4.2.0	2011 - 2015	de99ddc620c6260e5e4dd4d26486b82f8a5c2297fc5169b31607b61563f974de
FL EVS 4530v1	1.4.3.0	2011 - 2017	ff4c1b668dbdale7b23ba41547c62b53385afc836fd60717bc04739d9383b2aa
FL EVS 4530v2	1.4.3.1	2011 - 2018	07015a3e4d71e8683d3bf21b3d427f007a89b35d236767aedd35c4d94c3d8a12
EVS 6000 EVS 6010 EVS 6020 EVS 6030	1.5.0.0	2011 - 2018	07015a3e4d71e8683d3bf21b3d427f007a89b35d236767aedd35c4d94c3d8a12
EVS 6021 EVS 6030	1.5.1.0	2011 - 2018	07015a3e4d71e8683d3bf21b3d427f007a89b35d236767aedd35c4d94c3d8a12
EVS 6040 EVS 6043	1.5.2.0	2011 - 2018	07015a3e4d71e8683d3bf21b3d427f007a89b35d236767aedd35c4d94c3d8a12

EVS 6040 AZ	1.5.2.1	2011 - 2019	e39d71e88398beb836ee95973be1daec2bdbe091619891d8026fbf a15ae1798e
EVS 6050 EVS 6051	1.5.3.0	2011 - 2019	e39d71e88398beb836ee95973be1daec2bdbe091619891d8026fbf a15ae1798e

Proposed Plan

We are asking ES&S to place all affected versions with the labs as a de minimus change. According to Section 3.4.2. of the EAC's Testing and Certification Manual, a de minimis change is defined as a change to a certified voting system's hardware, software, TDP, or data, the nature of which will not materially alter the system's reliability, functionality, capability, or operation. Under no circumstance shall a change be considered de minimis if it has reasonable and identifiable potential to impact the system's performance and compliance with the applicable voting Standard.

The bitmap file is "minor in nature and effect" and qualifies under section 3.4.1 for a change order.

The VSTLS will perform a thorough review of all source code in all affected versions and the EAC will receive reports on all versions.

The de minimus process will allow for election officials to have full assurance that the labs have thoroughly reviewed and compared all affected versions to the trusted build as part of the de minimus review.

We are requesting this effort be performed in an expedited manner and within a two week time frame. We will share our findings with you and keep you updated throughout the process.

In weighing the merits, we believe this is the most optimal solution given the non-substantive impact of the bitmap file issue that is causing the hash mismatch. This process will also allow for verification that the bitmap file is in fact the only change and will result in compliance with EAC's certification program.

This effort doesn't impact the state's/jurisdiction's ability to request ES&S to perform a clean full installation which would also resolve the hash value issue. Given the short time window left until the election, we wanted to implement a solution that resolves the issue for all while simultaneously allowing you to focus on all the hard work you are doing to run safe and secure elections.

Finally, this proposed plan is based on the information the EAC has right now. Should we learn new material information, we will modify the plan and take whatever steps are appropriate.

Sincerely,

Mona Harrington

Mona Harrington, Executive Director

cc:

Kevin Rayburn, General Counsel

Jerome Lovato Director, Voting System Testing and Certification