

Hash Testing for Installed Software

Overview

A hash function is a reproducible method of reading a data stream to produce a number (the “hash value”) that serves as a digital “fingerprint” of the data. Hash testing is a common method used to verify the integrity of installed software. The process may be used to confirm that the voting system software running locally on your Hart InterCivic PC matches the software as certified by the NASED or the EAC.

To conduct hash testing, a third party program may be used to generate the hash value for installed software, and the hash value can be compared to that of the original source data to confirm that it has not been altered or corrupted. General directions for finding and downloading a third-party hash value generation tool and using that tool to verify Hart Voting System software application hash values are outlined below.

Note: Hash values for polling place device firmware (i.e. JBC, eSlate and eScan) are verified through your SERVO application, as outlined in the *SERVO Operations Manual*.

This information is being shared as a courtesy of Hart InterCivic. Contact your Secretary of State’s office for additional information concerning hash testing requirements in your state. Consult your Information Technology department for assistance with hash tools.

Note: You will have to download the executable files and the NSRL file to a non-Hart InterCivic PC and then take them to your HVS PC’s.

Never connect a Hart InterCivic PC or Laptop to the Internet.

Instructions

1. For an independent explanation of “MD5 Hash Testing,” go to www.dmares.com/maresware/hash_faqs.htm
2. Options for Hash verification tools that Hart InterCivic has tested are listed below.
Note: These tools are NOT endorsed by Hart InterCivic, but we have tested and verified their functionality.

Mares: <http://www.maresware.com/maresware/gk.htm#HASH>

AccuHash: <http://www.accuhash.com/>

HashMyFiles: <http://hashmyfiles.nirsoft-freeware.qarchive.org/>

MD5/SHA1 Hash Generator: <http://codecentral.borland.com/Item/25029>

3. The remaining steps provide a guide through the use of the Mares hash tool. Similar steps will be used for any of the hash verification tools listed above. For specific directions for each tool, refer to the associated website and the documentation that accompanies the tool.

Example Steps Using Mares Hash Tool

1. On a non-Hart InterCivic PC, go to <http://www.maresware.com/maresware/gk.htm#HASH>, in the “Hash” section at the bottom of the page, *right-click* on the hyperlink for “[GET the 32 bit.exe](#)” and select “**Save Target As...**” (OR follow links to purchase a CD).
2. Navigate to My Computer\Local Disk (C:) on your non-Hart InterCivic and *click* “**Save.**”
3. You will perform hash testing on applications located on your Hart InterCivic PCs, so you will need to copy the “hash.exe” program to the Local Disk (C:) of each.
Note: The sample download is a demo program, and is good for a limited time and a limited number of uses.

(Steps 4 - 10 apply regardless of the particular hash tool used.)

4. On a non-Hart InterCivic PC, go to www.nsrl.nist.gov/votedata.html
Note: This is the website of the National Software Reference Library. It contains the hash values of ITA certified voting system software voluntarily submitted by vendors.
5. *Right-click* on the link for “**NSRLFile.txt**” and select “**Save Target As...**”
6. In the “**File Name**” field, change the name of the file to “NSRLFile.csv” (i.e., change the file extension to csv), then *click* “**Save.**”
7. *Double-click* the .csv file you just saved, and it will open in MS Excel.
8. Select Column F, “Product Code” and sort by clicking the “a→z” (sort ascending) button. Accept the radio button to “expand the selection” and click **Sort**.
9. Sorted product codes in Column F are associated with the following versions of the Hart Voting System:
8392 Hart Voting System Version 4.1
8775 Hart Voting System Versions 6.0-6.1
8776 Hart Voting System Version 6.2.1
10. Column D, “File Name” references files on your PC that are contained within Hart applications. You can verify the authenticity of the files on your PC by running a hash test and comparing the results of the test with the certified hash value you just downloaded from the NSRL website.
11. With the Mares hash tool, for example, if you wanted to run a hash test on the “Boss.exe” file in the BOSS application on your computer, you would:
 - a. *Left-click* on the **Start Menu**, select **Programs**, navigate to the **Accessories** folder and *click* on **Command Prompt**.
 - b. Type the “hash” command and file path of the boss.exe file (on the C drive in the Boss root directory), as follows: “hash C:\boss\boss.exe” (without the quotation marks). Make sure you are at the C:\> prompt before entering path.
 - c. Press **Enter**.
 - d. Compare the resulting hash string with the reference value in Column B (MD5) of your “NSRLFile.csv” file. The strings should match exactly. If they do, then the file you have just evaluated on your PC matches the file version certified by the federally recognized agency.

Note: Steps for alternative hash verification tools listed above are similar to the steps for the Mares tool; in each case, simply specify the location of the executable file to be verified, and compare the results with the reference value in Column B (MD5) of the “NSRLFile.csv” file.