

Hart InterCivic Verity 2.0

The Hart InterCivic Verity version 2.0 voting system was examined at the Office of the Secretary of State in Austin on June 29-30, 2016. It is a modification to the previous certified version 1.0. This is the identical system reviewed for the U.S. Elections Assistance Commission (EAC). Its EAC certification # is HRT-Verity-2.0.

The following tables lists the applications and COTS hardware components used during the examination.

Table 1 - Proprietary Software Components

Product (election central)	Application/Firmware	Release #
Verity Build	Election ballot definition validation and election media creation	2.0.2
Verity Data	Data management software	2.0.2
Verity User Management	Election system user management	2.0.2
Verity Election Management	Election database management system	2.0.2
Verity Desktop	Software used to manage computer settings and export	2.0.2
Verity Central	High speed digital scanner	2.0.2
Verity Count	Central count accumulation and tallying	2.0.2
Product (voting center)	Application/Firmware	Release #
Verity Scan	Precinct or early-voting ballot scanner (firmware)	2.0.3
Verity Touch Writer	Ballot marking device (BMD)	2.0.3
Verity Touch	DRE Voting Device	2.0.3
Verity Touch with Access	Accessible DRE Voting Device	2.0.3
Verity Controller	DRE polling place management device	2.0.3

The components listed above for the election central location run on a server or PC running Windows Embedded Standard 7 with Service Pack 1, 64-bit. The OS is configured for Verity kiosk operations to prevent direct access to the OS.

The software components listed above for the voting center run on proprietary hardware running Windows Embedded Standard 7 with Service Pack 1, 32-bit. The OS is configured for Verity kiosk operations to prevent direct access to the OS.

Table 2 - COTS Hardware Components

Component/Description	Manufacturer	Model/Part #
Verity Touch Writer/Ballot/Report Printer	OKI	B431d
	OKI	C831dn & C911 dn
Verity Central Scanner	Canon	DR G1100 & DR G1130
	Kodak	i5600
Verity Application Workstation	HP	Z230
Verity Application Workstation Monitor	HP	P231

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Component/Description	Manufacturer	Model/Part #
Verity Application Workstation Keyboard	HP	N/A
Verity Application Workstation Mouse	HP	N/A
Ethernet Switch	HP	1405-8G
Verity Tablet	ADLink	2005301
Verity vDrive	Apacer	AH322
Verity Device AC-DC Power Supply	AP Power	VEH60WS24
Verity Print, Controller, Touch, Touch with Access AC-DC Power Supply	SL Power	TE60B2449F02
Verity Device Battery	TOTEX	1005015 U80327
UPS for Touch Writer Printer	EATON	5P1500

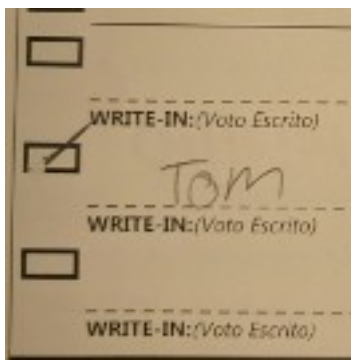
For a detailed explanation of the hardware components and applications of the system please refer to the EAC certification test report [here](#).

Findings

- The responses provided for Form-101 are acceptable.
- The system software components listed in Table 1 were built successfully and the file hashes were verified to be correct.
- The prepared test ballots and the manually voted test ballots were recorded and tallied correctly.
- The accessibility devices worked as expected.
- The real-time audit log still did not start each new log entry on a newline. This makes it difficult to read the log. The vendor said that this was to conserve paper. The saving of paper does not justify the lack of readability. This was called out in my report for version 1.0. It should be corrected in the next release of the Verity system.
- External USB ports are customized to prevent non-Verity created thumb-drives or COTS cables from being used. The cables that connect the precinct machines in a network are custom cables. A jurisdiction should have spare cables on-hand on election night if they are using the Verity Touch precinct devices. The cables must be acquired from Hart.
- The internal write buffers have been disabled for the CFAST and vDrive drive write operations to increase reliability in the case of power failures. This seems like a unnecessary customization because the machines are required (federal requirement) to be sustained by a battery backup until a machine can be gracefully shutdown. However, the disabling of the buffers does not present a problem.
- Each precinct Verity Controller can support up to 12 Touch DRE voting machines (via the Ethernet over USB network). This seems to be adequate for most precincts.

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- The Verity Touch Writer is slow printing the (marked) paper ballot. Therefore, a jurisdiction should not plan to use it for all voters in a voting location.
- A tally report at a voting location cannot be run during an early-voting period. The report can only be run when the date/time that was configured in Verity Build has been reached. The report also requires the Admin role and password.
- A Verity Touch DRE can be taken to a voter at the curb if necessary. The votes will be recorded (transferred to the Verity Controller) once the machine is reconnected to the network.
- The logs from the precinct devices are automatically backed-up to the vDrives. They imported into the Verity Election Management system when the vDrives cast vote records (CVR's) are processed. The log entries are in clear language and complete. Logs can be filtered to search for specific events and can also be exported in either XML or CSV formats.
- Verity Scan can be configured to use unique ID's (printed on the ballot stock). If configured this way, SCAN will reject a duplicate ballot (same ID).
- If the real-time log at election central is taken off-line, the operator on Verity Count system is logged-out. This prevents the processing of ballots until the printer is back on-line and the operator has logged back in.
- The central servers are using a RAID-1 (mirroring) disk sub-system so the data is not going to be lost due to a single disk failure.
- The Verity Scan (precinct device) can be configured to save images on the vDrives in addition to the CVR's. I recommend for it to be configured this way.
- The 2.0 release fixed a serious problem that was discovered in the 1.0 release examination. The problem occurred when importing the vDrives created from the Verity Central (scan) system into the Verity Count system. This only occurred when ballots were adjudicated on the Central Scan system and there was a straight-party vote with a write-in selected on a ballot. This “corrupted” the vDrive and it could not be loaded into Verity Count. It was verified that the problem has been corrected.
- There was one anomaly during the examination. A ballot scanned by both the Verity Scan and Verity Central scanners was not processed the same. The pre-printed ballot had a blank spot on the selection box (see below). The Verity Scan machine rejected the ballot twice and a pop-up error message stated that there was a problem with the ballot's bar code. There was no problem with the bar code. This message was erroneous and should be corrected. On the 3rd attempt the ballot was accepted and recorded correctly.



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The exact same ballot was rejected repeatedly when it was fed into the Central scanner.

All voting system scanners have difficulty reading marginal (in terms of density, size and location) marks, consistently. Previous federal testing has revealed that sometimes there are differences in the scan processing of the same batch of ballots from machines of the exact model and configuration. Even the same machine can sometime have a discrepancy when scanning the same batch.

I do not believe this indicates a significant problem. If a voter gets a error message on the Scan machine during an election, they will ask for help. The ballot will likely be spoiled and a new ballot issued. Scanning the same ballot at the voting and central locations should never happen during a real election.

The fact that the Central machine rejected the ballot each time is because it has a different scanning engine. The anomaly in this case was not even for a marginal voting mark, but rather a mis-print on the pre-printed ballot stock.

Conclusion

Overall, the Verity system is easy to use for both voter and election workers. It worked very well and tallied correctly. I believe it is suitable for the intended purpose. I believe the system meets the requirements of the Texas Election Code and recommend certification.

Tom Watson
Examiner