Test Report

Clear Ballot Group
ClearVote 1.3.3 Voting System
Certification Testing

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1 Introduction

The purpose of this Test Report is to document the procedures that Pro V&V, Inc. followed to perform certification testing of the Clear Ballot Group's ClearVote 1.3.3 Voting System to the requirements set forth in the Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (VVSG).

1.1 Scope

The scope of this testing campaign incorporated a sufficient spectrum of physical and functional tests to verify that the ClearVote 1.3.3 Voting System conformed to the applicable EAC 2005 VVSG requirements, with the exception of Volume I, Section 4.1.2.13.

Specifically, the testing event has the following goal:

- Evaluate the ClearVote 1.3.3 Voting System to the applicable requirements of the EAC 2005 VVSG

1.2 References

The documents listed below were utilized in the development of this Test Report:

- ClearDesign and ClearCount 1.3.3 Upgrade Notes
- Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (VVSG) Version 1.0, Volume I, "Voting System Performance Guidelines", and Volume II, "National Certification Testing Guidelines"
- National Voluntary Laboratory Accreditation Program NIST Handbook 150, 2006 Edition, "NVLAP Procedures and General Requirements (NIST Handbook 150)", dated February 2006
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, "Voting System Testing (NIST Handbook 150-22)", dated May 2008
- Pro V&V, Inc. Quality Assurance Manual, Revision 7.0
- United States 107th Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Election Assistance Commission Testing and Certification Program Manual, Version 2.0

- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 2.0
- EAC Requests for Interpretation (RFI) (listed on www.eac.gov)
- EAC Notices of Clarification (NOC) (listed on www.eac.gov)
- ClearVote 1.3.3 Technical Data Package *(A listing of the TDP documents submitted for this test campaign is listed in Section 2.3 of this Test Plan)*

1.3 Terms and Abbreviations

"BMD" – Ballot Marking Device

"Clear Ballot" – Clear Ballot Group

"COTS" – Commercial Off-The-Shelf

"DRE" – Direct Record Electronic

"EAC" – Election Assistance Commission

"EMS" – Election Management System

"FCA" – Functional Configuration Audit

"PCA" – Physical Configuration Audit

"TDP" – Technical Data Package

"HAVA" – Help America Vote Act

"2005 VVSG" – 2005 Voluntary Voting System Guidelines

1.4 Background

The ClearVote 1.3.3 Voting System is comprised of previously VSTL tested and state certified components. The ClearVote 1.3.3 Voting system is based on the ClearVote 1.3 Voting System. Clear Ballot Group has identified the following functional and usability enhancements, as well as defect resolutions, which are incorporated into the ClearCount, ClearDesign, and ClearAccess components of the ClearVote Voting System:

ClearCount

- When creating an XML results file, the values for the overvotes attribute in the Contest,ContestGroup, and ContestGroupVotes elements now calculate correctly.
- When using the Card Resolutions tool to adjudicate unresolved cards, multiple users (with modify access or above) can now resolve cards simultaneously without error. Previously, simultaneously resolving the same card could sometimes result in the value for the Ballots with Contest being inaccurate.
- Enhanced system capacity for simultaneous adjudications that previously affected Ballots with Contest counts.
- The Safely Merge BDF feature now imports UTF-8 multibyte characters properly.
- The XML results export now exports the regVoters attribute if its value is zero. The export now also handles null fields appropriately.

ClearDesign

- Headers with previously assigned contests now can be saved properly if those contests have been deleted. This was primarily an issue with templates.
- ClearDesign now supports zipped files larger than 2 GB and indicates progress while zipping files.
- ClearDesign now prints a card for each ballot set that uses it. The split name at the bottom of the card includes the ballot set name if the card is used by more than one ballot set.
- When a precinct has splits with no contests associated with it either at the beginning or in the middle of splits that do, those empty splits receive a common sequence number, but don't print (because they don't have any contests).

ClearAccess

- Ballot Report generation when split identifier is set to "Ballot Sequence"

2 Test Candidate

A description of the system tested, as taken from the manufacturer's technical documentation is provided in the paragraphs below.

The ClearVote 1.3.3 Voting System is a voting system encompassing all aspects of election management, including election definition and configuration, ballot creation, voting, vote data management, reporting, and auditing. The ClearVote 1.3.3 Voting System is a browser-based voting system that consists of the major components listed below:

ClearDesign

ClearDesign is an interactive set of applications which are responsible for all pre-voting and post-voting groups of activities in the process of defining and managing elections. This includes ballot design, proofing, layout, and production.

ClearAccess

ClearAccess is an accessible touchscreen ballot marking device (BMD) used for the creation of paper ballots that can be scanned and tabulated by ClearCount.

ClearCount

ClearCount is a central, high-speed, optical scan ballot tabulator coupled with ballot processing applications.

The ClearVote 1.3.3 Voting System utilizes the data flows and configurations depicted in the following figures to exchange information, as taken from the Clear Ballot-provided technical documentation:

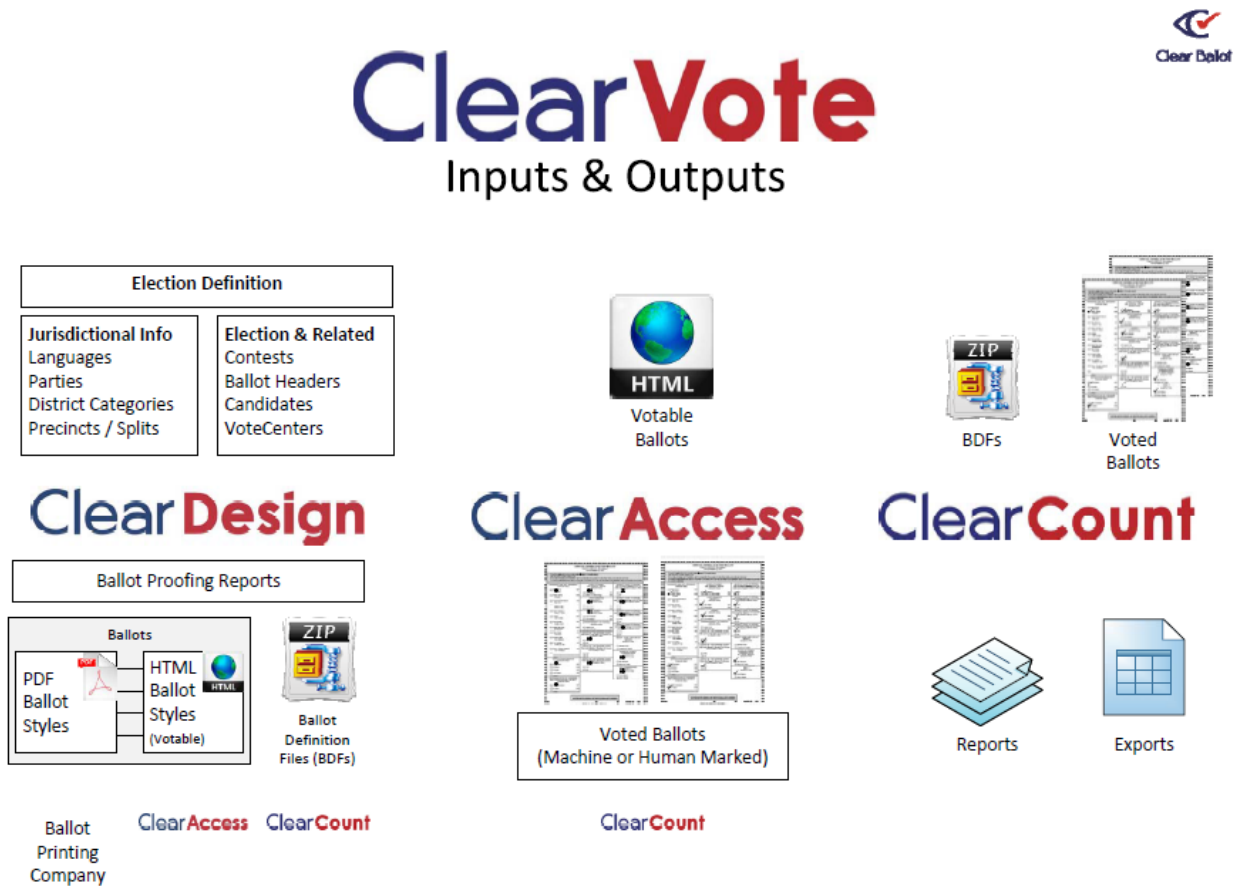


Figure 2.1 ClearVote Inputs & Outputs Diagram

The inputs and outputs of the ClearVote System depicted in Figure 2.1 are listed below:

- Inputs: Election Definition
- Outputs: Ballot proofing reports, PDF ballot styles, HTML Anywhere ballot marking files, Ballot Definition files

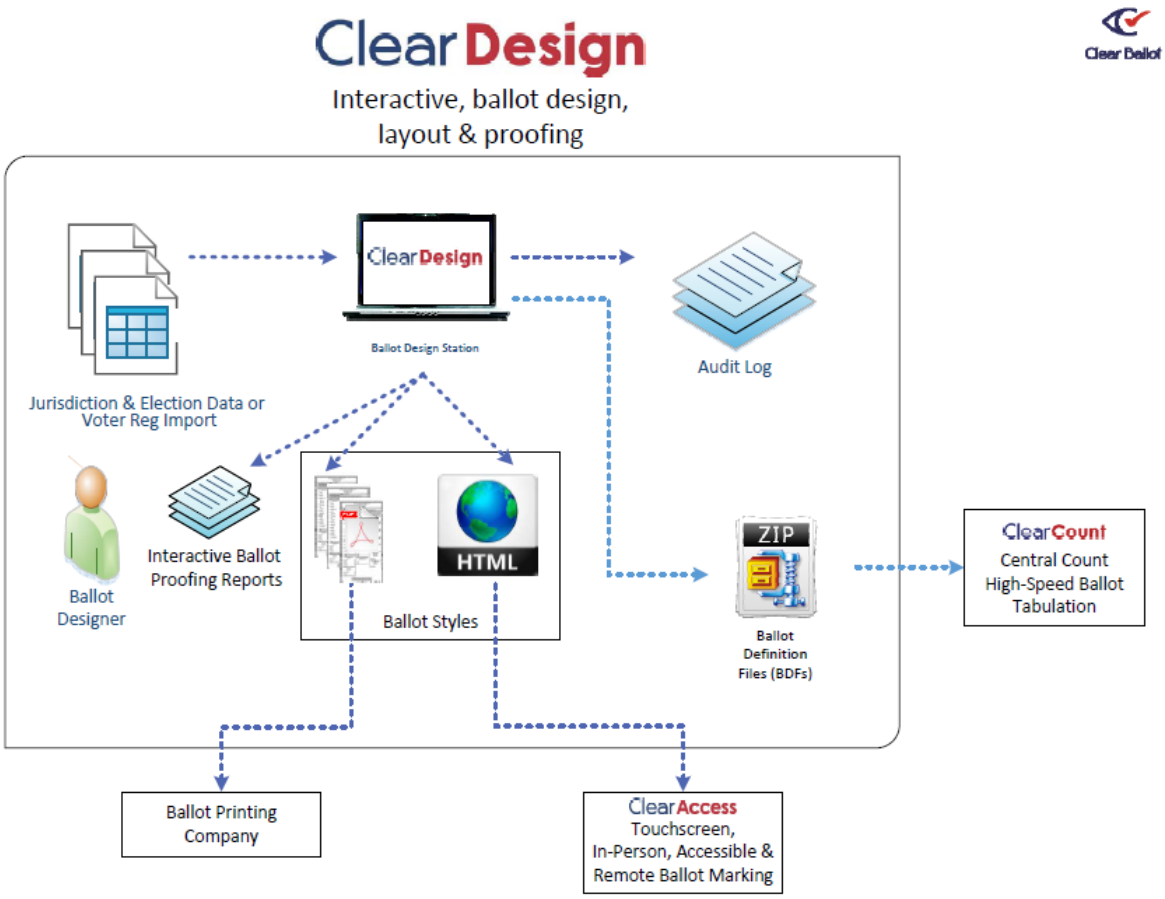


Figure 2.2 ClearDesign Interactive, Ballot Design, Layout, and Proofing Diagram

As illustrated in Figure 2.2, ballot design, proofing, layout, and production are accomplished in ClearDesign, the ballot design component of the ClearVote product family. The ClearDesign system consists of the following physical components (all of which are unmodified COTS hardware and are connected via closed, wired Ethernet connections): DesignServer, DesignStation(s), and router.

Figure 2.3 ClearAcess Touchscrren, In-Person, and Accessible Ballot Marking Diagram

ClearAccess, depicted in figure 2.3, is an accessible touchscreen ballot marking device (BMD) used for the creation of paper ballots that can be scanned and tabulated by ClearCount. The ClearAccess ballot marking system consists of one or more Ballot Marking Stations (BMS) having the following physical components (all of which consist of standalone, unconnected, unmodified COTS hardware): Ballot Marking Device (BMD), privacy screen, Personal Assistive Technology Devices (PATS), USB flash drive, and laser printer.

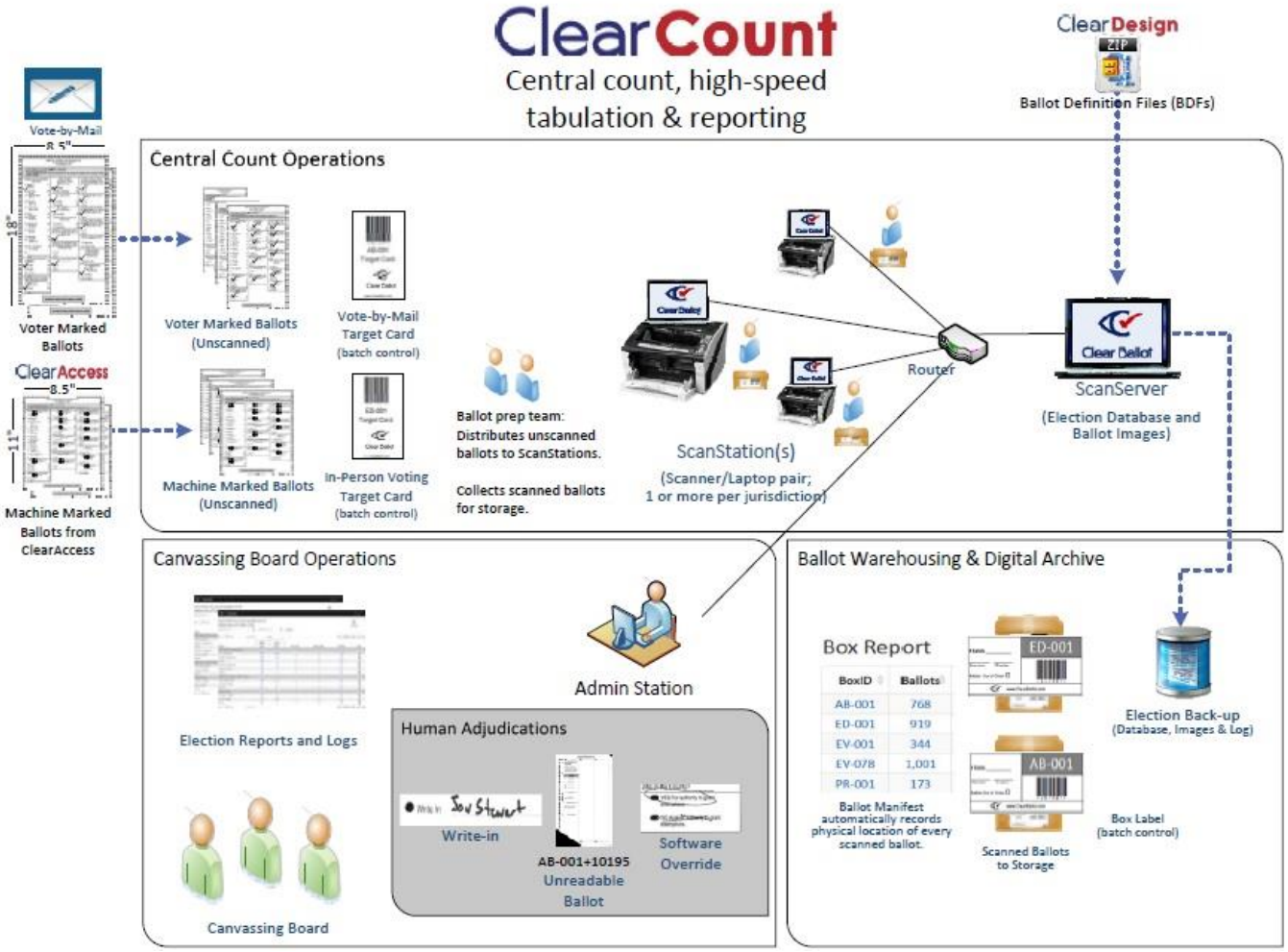


Figure 2.4 ClearCount Central Count Tabulation and Reporting Diagram

Tabulation and reporting at the central location is accomplished by ClearCount, as depicted in Figure 2.4.

The follow table 2.1 provides the software components of the ClearVote 1.3.3 Voting System that were evaluated during this test effort.

Table 2.1: Software /Firmware Versions

Software /Firmware	Version
ClearDesign Components, Version 1.3.3	
Ubuntu	14.04.3 server
MySQL Linux	5.5.32 The database engine
Apache2	2.22-6ubuntu5.1
libapache2-mod-fcgid	1:2.3.7-0.ubuntu2
PhantomJS	1.9.01-1
Python 2	2.7.6
Python web.py	1:0.37+20120626-1
Python MySQL dB library	1.2.3-2ubuntu1
Python SQLAlchemy	0.8.4-1build1
Python Pillow library	2.3.0-1ubuntu3
Python dbutils library	1.1
Python xlrd library	0.9.4
Python rtf library	0.2.1
Python FontTools library	3
Python PyCrypto library	2.6.1
JavaScript jQuery	1.10.2
JavaScript DataTables	1.10.5
JavaScript Bootstrap	3.0.0
JavaScript jQuery-Impromptu	5.2.3
JavaScript jQuery-qrcode	1.0
JavaScript jQuery-splitter	0.14.0
JavaScript jQuery-ui	1.10.4
JavaScript jscolor	1.4.2
JavaScript tinymce	4.1.9
JavaScript fastclick	1.0.4
JavaScript libmp3lame	na
JavaScript jszip	na
JavaScript papaparse	4.1.2
ClearAccess Components, Version 1.3.3	
Windows	8.1 or 10
Python	2.7.10
Python web.py	0.38
Python pywin32 library	2.2.0
Python pyCrypto library	2.6.1
JavaScript DataTables	1.10.5
JavaScript jQuery	1.10.2

ClearCount Components, Version 1.3.3	
Debconf	1.5.49ubuntu1
python	2.7.4
python-mysqldb	1.2.3-1ubuntu1
PIL-python-imaging	1..7+2.0.-1ubuntu0.1
PyInstaller	2.1
python-webpy	1:0.37+20120626-1
Ubuntu Server	13.04-serveramd64
mysqlserver	5.5.32
apache2	2.2.22-6ubuntu5.1
libapache2-mod-fcgid	1:2.3.7-0.ubuntu2
samba	2:3.6.9-1ubuntu1.1
JavaScript Bootstrap library	2.3.2
JavaScript Chosen library	1.0.0
JavaScript jQuery library	1.10.2
J JavaScript jQuery-migrate library	1.2.1
JavaScript DataTables library	1.9.4
JavaScript FixedHeader library	2.0.6
JavaScript hotkeys library	no version, dated May 25, 2013
JavaScript pep library	no version, dated Oct 4, 2013
JavaScript tooltip library	1.3
JavaScript LESS library	1.3.3
JavaScript TableTools library	2.1.5
ZeroClipboard.js	na

The follow table 2.2 provides the hardware components of the ClearVote 1.3.3 Voting System that were evaluated during this test effort.

Table 2.2: Hardware Components

ClearVote 1.3.3 Voting System Component	Serial Number(s)
ClearDesign Components	
Dell Precision M2800	13Q0362
Dell Laptop Latitude E5570	927QQC2
TRENDnet Switch TEG-S80g	CA11238032857
ClearAccess Components	
Dell OptiPlex 3240 All In One	F0B6B02
Dell Inspiron 15 5000 Series 2 in 1 (Windows 10)	29XF1C2
Oki Data Laser Printer Model: B432dn	SAK5B007647A0
Brother Laser Printer Model: HL-L2340DW	U63879M4N628612, U63879M4N628617, & U63879M4N628535
HP OfficeJet 100 Mobile printer	MY648F10JG

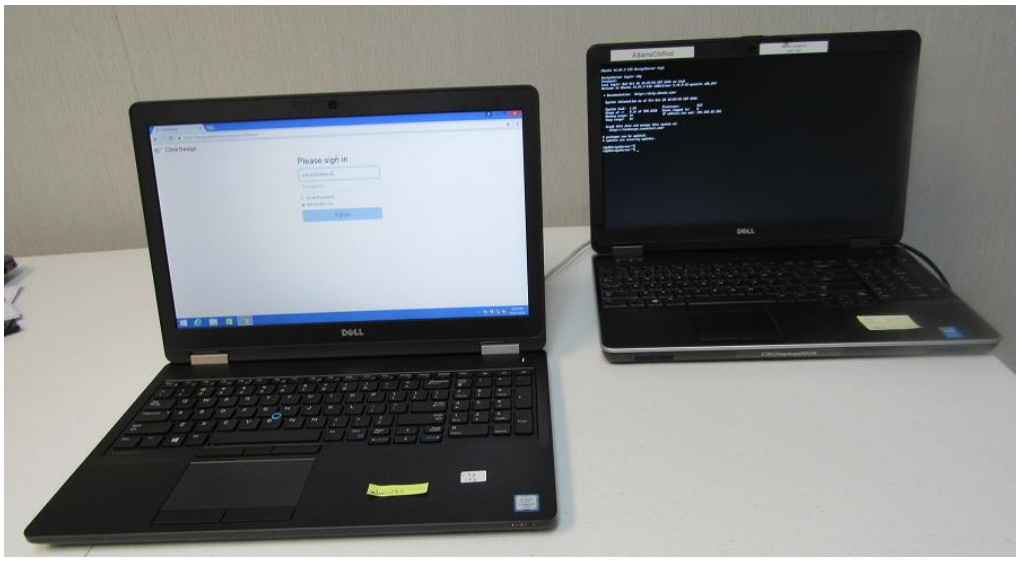
HP Inkjet Printer Model: HP7612	CN6343R0D6
APC Smart-UPS 1500 (for All In One PC) Model: SMT1500	3S1525X07491
APC Smart-UPS 2200 (for the Laser Printers) Model: SMT2200	AS1603160039
Origin Instruments Sip/Puff Breeze with Headset Model: BZ2	AC-0313-H2
Storm EZ Access Keypad Model: BZ2	1500005
Hamilton Buhl Over-Ear Stereo Headphones Model:HA-7	CLR-002-20-HP
ElectionSource Table Top Voting Booth (Privacy Screen) Model: VB-60B	CLR-002-21-VB
Hosa Technology Male 3.5 mini to Female ¼" Adapter	Model: GMP112
Hamilton Buhl Sanitary Headphone Covers	Model: HYGENX45
Security Seals Model: MRS2-12030	CLR-002-22-Seal
ClearCount Components	
Fujitsu fi-6800 Scanner	A9HCA00737
Fujitsu fi-6670 Scanner	AAADC00936
Fujitsu fi-7180 Scanner	A20D000798
IBML ImageTrac Lite Scanner 6000 series	A-108126000019
IBML ImageTrac DS series Scanner 1210	763SHT416568M100050029
Toshiba Laptop Model: S55-A5167	1E098351S, 1E123732S, & 1E068199U
Lenovo Laptop Model: Y50-70 20378 59441402	CB34965397& CB34673854
Dell Laptop Latitude E5570	5537MC2, J2ZQQC2, & FXDQQC2
HP ProBook Laptop Model: 4540s	CLR-002-23-Laptop
Lenovo Server Tower Model: TS140	MJ03T42D
Dell 22 inch Monitor Model: S2240M	CN-0CFGKT-64180-58B-0X3T
Apex Boxx Server	B159306
APC Smart-UPS 1500 (for Fujitsu scanners) Model: SMT1500	3S1525X07491
APC Smart-UPS 2200 (for IBML scanners) Model: SMT2200	AS1603160039
TP-Link VPN Router Model: HP7612	2149342000209
TRENDnet TEW-733GR	C1408RN800574
NETGEAR ProSAFE FVS318G 8-Port Gigabit VPN Firewall (FVS318G-200NAS)	40F266BA00280
Lenovo USB Portable DVD Writer Model: GP60NB50	411HV005130 & 411HR027583
Dell OptiPlex 7440 All In One	64WPXG2

2.1 Testing Configuration

The testing event utilized one setup of the ClearVote 1.3.3 Voting System and its components. The following is a breakdown of the ClearVote 1.3.3 Voting System components and configurations for the test setup:

Standard Testing Platform:

The standard testing platform consisted of one ClearVote 1.3.3 Voting System in a standalone configuration. In the pre-election phase of testing, ballots were created utilizing ClearDesign, the EMS component of the ClearVote 1.3.3 Voting System. Ballot styles were then imported into ClearAccess for ballot marking. Once ballots were marked and the polls were closed, ballot reconciliation procedures were performed and the ballots were tabulated by ClearCount, the central count tabulation and reporting component of the ClearVote 1.3.3 Voting System.



Photograph 2-1 ClearDesign Configuration

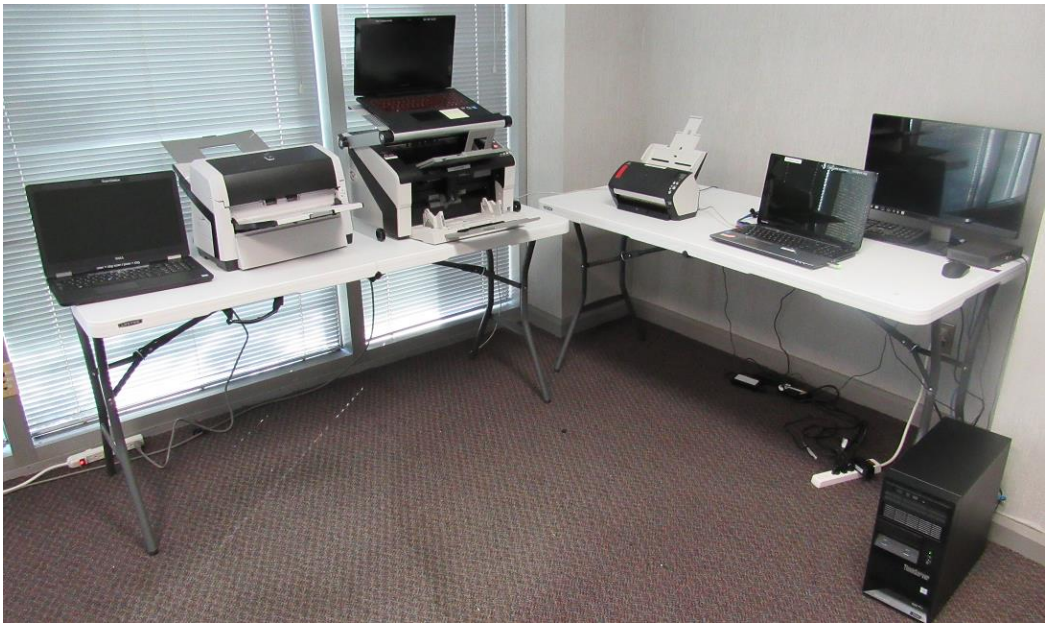
The tested configuration for ClearDesign consists of the following components:

- ClearDesign Server Laptop (Dell Precision M2800 or Dell Laptop Latitude E5570)
- Client Laptop (Dell Laptop Latitude E5570)
- Brother Laser Printer (Model: HL-L2340DW) (not pictured)
- TRENDnet Switch (Model: TEG-S80g) (not pictured)

Photograph 2-2 ClearAccess Configuration

The tested configuration for ClearAccess consists of the following components:

- ClearAccess All-in-One (Model: Dell Optiplex 3240)
- Brother Laser Printers (Model: HL-L2340DW)
- Oki Laser Printers (Model: B432dn)
- HP InkJet Printer (Model: HP7612) *(not picture)*
- Storm EZ Access Keypad (Model: EZ08-22201)
- Origin Instruments Sip/Puff Breeze (Model: BZ2)
- Over-ear Stereo Headphone (Model: Hamilton Buhl HA-7)
- ClearAcess Laptop (Model: Dell Inspiron 15 5000 Series) (*not pictured)*
- HP OfficeJet 100 Mobile printer (*not pictured)*
- ElectionSource Table Top Voting Booth Privacy Screen (Model: VB-60B) (*not pictured)*
- Battery Backup (APC Smart-UPS 1500 (for the All in One PC) (*not pictured)*
- Battery Backup (APC Smart-UPS 2200 (for laser printers) (*not pictured)*



Photograph 2-3 ClearCount Configuration

The tested configuration for ClearCount consists of the following components:

- ScanServer Laptop (Lenovo: Y50-70 or Dell: E5570 or HP: ProBook 4540s)
- ScanServer Tower (Lenovo: TS140)
- ScanStation Laptop (Toshiba: S55-A5167 or Lenovo: Y50-70 or Dell: E5570)
- ScanStation Tower (Apex Boxx Server used for IBML Image-Trac Lite Scanner) (*not pictured)*
- ClearCount Scanner (Fujitsu fi-6800)
- ClearCount Scanner (Fujitsu fi-6670)
- ClearCount Scanner (Fujitsu fi-7180)
- ClearCount Scanner (IBML ImageTrac Lite Scanner 6000 series) (*not pictured)*
- ClearCount Scanner (IBML ImageTrac DS series Scanner 1210 or 1155) (*not pictured)*
- TP-LINK VPN Router (Model: TL-R600VPN) (*not pictured)*
- Battery Backup (APC Smart-UPS 1500 (for Fujitsu scanners) (*not pictured)*
- Battery Backup (APC Smart-UPS 2200 (for IBML scanners) (*not pictured)*
- NETGEAR ProSAFE FVS318G 8-Port Gigabit VPN Firewall (Model: FVS318G)
- ClearCount Adjudication Station (Dell OptiPlex 7440 All In One) (*not pictured*)

2.2 Test Support Equipment/Materials

All test support equipment/ materials required to facilitate testing were supplied by Clear Ballot.

2.3 Technical Data Package

This subsection lists all manufacturer provided documentation that is relevant to the system that was tested.

The following TDP documents were submitted as part of this test campaign:

Table 2.1: ClearVote 1.3.3 Technical Data Package

Document Name	Version	Document Number
ClearAccess 1.3.3 Build Procedures	1.0.2	100051-10010
ClearAccess 1.3.3 Installation Guide	1.0.2	100053-10010
ClearAccess 1.3.3 Upgrade Notes	---	100037-01
ClearCount 1.3.3 Upgrade Notes	---	1011-01
ClearCount 1.3.3 Election Administrator's Guide	3.3	100004-10009
ClearCount 1.3.3 Election Preparation and Installation Guide	3.2.1	100006-10005
ClearCount 1.3.3 Reporting Guide	1.01	100070-10010
ClearDesign 1.3.3 Upgrade Notes	---	100012-01
ClearDesign 1.3.3 Build Procedures	---	100083-10010
ClearDesign 1.3.3 Installation Guide	3.1.12	100063-10010
ClearDesign 1.3.3 Installation Upgrade Instructions	---	---
ClearDesign 1.3.3 User Guide	1.0.4	100041-10010

3 Test Process and Results

The following sections outline the test process that was followed to evaluate the ClearVote 1.3.3 Voting System to the test goals defined in the scope of this test report.

3.1 General Information

All testing was conducted by qualified Pro V&V personnel at the Pro V&V test facility located in Huntsville, AL.

As stated in section 1.2, Hardware Requirements listed in the EAC 2005 VVSG Volume I Section 4.1.2.13 were not tested as part of this test campaign.

3.2 Test Cases/Procedures

Test procedures were developed to evaluate the system being tested against the stated requirements. Prior to execution of the required test procedures, the system under test was subjected to testing initialization to establish the baseline for testing and ensure that the test candidate matched the expected test candidate and that all equipment and supplies are present.
The following tasks were completed during the testing initialization:

- Ensure proper system of equipment. Check network connections, power cords, keys, etc.
- Check version numbers of (system) software and firmware on all components.
- Verify the presence of only the documented COTS.
- Ensure removable media is clean
- Ensure batteries are fully charged.
- Inspect supplies and test decks.
- Record protective counter on all tabulators.
- Review physical security measures of all equipment.
- Record basic observations of the testing setup and review.
- Record serial numbers of equipment.
- Retain proof of version numbers.

3.3 Test Results

The procedures that were utilized during the test engagement and the results obtained are summarized in the following paragraphs. During the evaluation, the test team made observations of general system behavior.

Limited TDP Review - This review is conducted only for stated functionality review and verification. This review does not address consistency or completeness of documents. Results of the review of each document were entered on the TDP Review Checklist and were reported to Clear Ballot for disposition of any discrepancies. This process was ongoing until all discrepancies were resolved. Any documents that were revised during the TDP review process were compared with the previous document revision to determine changes made, and the document was re-reviewed to determine whether the discrepancies had been resolved.

Summary Findings:

During execution of the test procedure, it was verified that the technical documentation provided for the ClearVote 1.3.3 Voting System was successfully subjected to the TDP review with all discrepancies that were noted during the review being resolved.

Source Code Review - The Source Code Review was a formal review of the submitted source code to specific requirements. The requirements may be published standards, manufacturer supplied requirements, and/or third party supplied requirements. The Source Code Review included a Trusted Build of the submitted source code.

Summary Findings:

During execution of the test procedure, it was verified that the source code provided for the ClearVote 1.3.3 Voting System successfully met the requirements. After a review of the submitted code was completed, all issues were reports and resolved prior to the Trusted Build.

Trusted Build (EAC equivalent Compliance Build) – To perform the trusted build Clear Ballot-submitted source code, COTS, and Third Party software products were inspected and combined to create the executable code. Additionally, during the performance of the compliance build, the build documentation was reviewed.

Summary Findings:

During execution of the Trusted Build, the source code submitted by Clear Ballot Group and reviewed by PRO V&V was successfully built using the submitted COTS and third party software products, and the reviewed build documentation.

Functional Configuration Audit (FCA) – During this area of testing, the specific functionality of the system under evaluation that is claimed by the manufacturer was targeted to ensure the product functioned as documented. This testing used both positive and negative test data to test the robustness of the system. The focus of the FCA was the incorporation of the general improvements to the system.

Summary Findings:

During the test case design and execution phases of the FCA, it was verified that the ClearVote 1.3.3 Voting System successfully completed the FCA with all actual results obtained during test execution matching the expected results.

Limited Physical Configuration Audit (PCA) – A PCA was performed to compare the voting system components submitted for testing to the manufacturer's technical documentation. The PCA was conducted in two phases: Initial and Final. The Initial PCA was conducted in order to baseline the system prior to test campaign commencement. The Final PCA was conducted in order to verify the final software and hardware configurations.

Summary Findings:

During execution of the test procedure, the components of the ClearVote 1.3.3 Voting System were documented by component name, model, serial number, major component, and any other relevant information needed to identify the component. For COTS equipment, every effort was made to verify that the COTS equipment had not been modified for use. Additionally, each technical document submitted in the TDP was recorded by document name, description, document number, revision number, and date of release. At the conclusion of the test campaign, test personnel verified that any changes made to the software, hardware, or documentation during the test process were fully and properly documented

System Integration – The system level certification tests addressed the integration of the hardware and software. This testing focused on the compatibility of the voting system software components and subsystems with one another and with other components of the voting system. During test performance, the system was configured as would be for normal field use.

Summary Findings:

To perform the System Integration test, a General and a Primary elections were designed in ClearDesign. The election were then loaded into ClearAccess. Ballots were marked using ClearAccess and were read by ClearCount. The results were adjudicated by ClearCount for results reporting. During execution of the test procedure, it was verified that the ClearVote 1.3.3 Voting System successfully completed the system level integration tests with all actual results obtained during test execution matching the expected results.

Regression Testing – Regression testing was performed as needed on the system components to verify that all functional and/or software modifications made during the test campaign did not adversely affect the system and its operation.

Summary Findings:

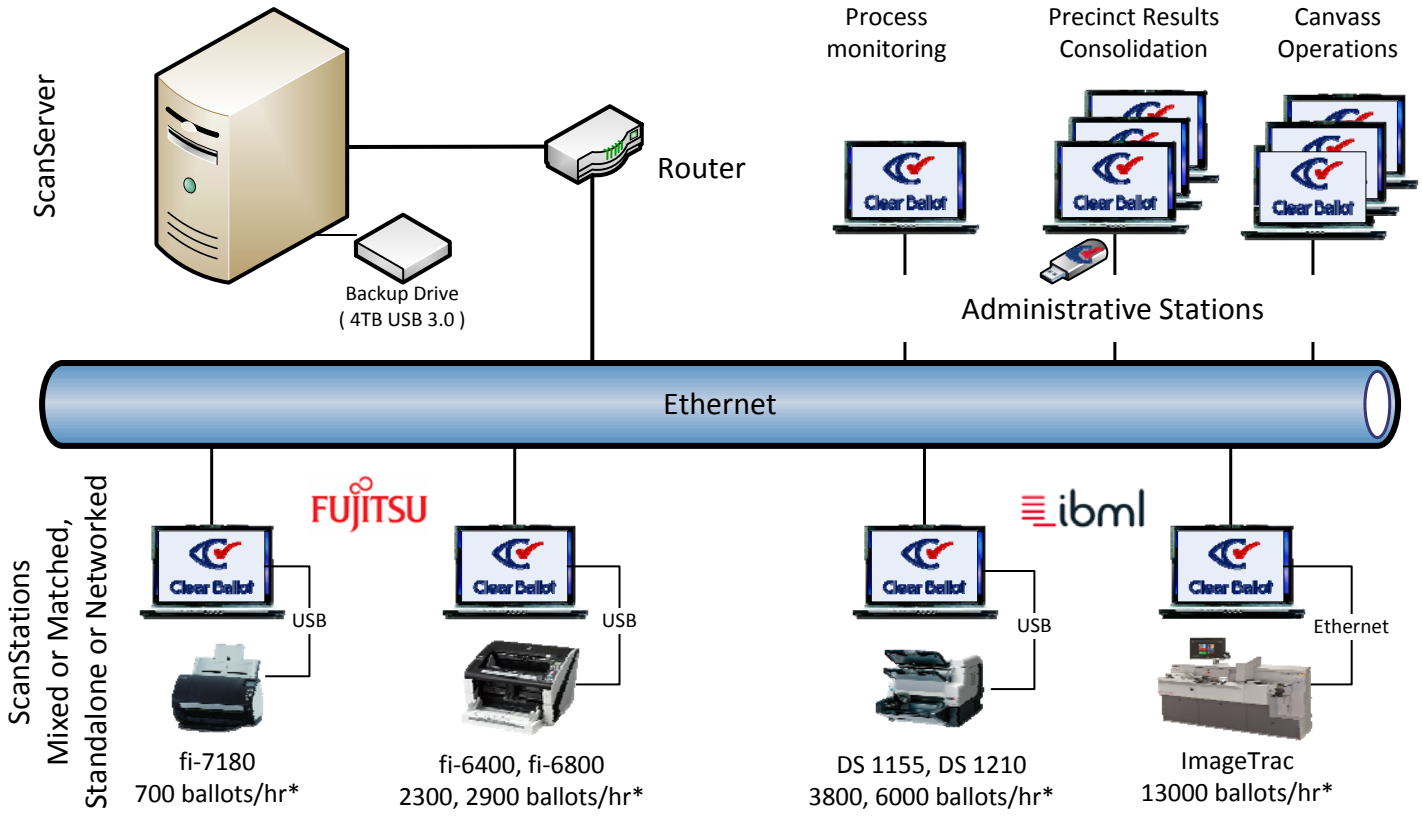
During execution of the test procedure, it was verified that the ClearVote 1.3.3 Voting System successfully completed the functional regression test with all actual results obtained during test execution matching the expected results.

4 Conclusions

Based on the results obtained during the test campaign, Pro V&V determines that the ClearVote 1.3.3 Voting System, as presented for evaluation, meets the requirements to the Election Assistance Commission 2005 Voluntary Voting Systems Guidelines for the requirements that were tested. Pro V&V, Inc. has determined that ClearVote 1.3.3 Voting System is in compliance with Election Assistance Commission 2005 Voluntary Voting Systems.

ClearCount

Central Count Ballot Scanning Architecture



* Sustained Scanning Performance
18" folded ballots

-- Increasing Performance --

Administrative Station(s)

- Process monitoring
- Precinct results consolidation
- Canvass operations
  - * Write-in adjudication
  - * Digital duplication
  - * Manual overrides
- Election results reporting

Software:
Windows 8.1 Pro
Firefox or Chrome browser
Hardware:
Intel i7 CPU; 8GB RAM 500GB disk

ScanServer Laptop or Desktop

- Results & ballot image consolidation
- Serves Administrative Stations

Software
Linux
MySQL
ClearCount™
Hardware specs
Intel Core i7 quad CPU;
16GB RAM; 4TB Disk

Network

Protocol: Ethernet 1 GB, 10GB*
Router: 8-24 port

ScanStation(s)

- Ballot image capture
- Ballot interpretation & server upload

Software
ClearCount™
Fujitsu ScandAll Pro, ibml SoftTrac
Windows 8.1 Pro
Hardware: Computing
Intel: Core i7 4-core, Xeon 22-core*
16 GB RAM, 64 GB*memory
500GB disk
Hardware: Image Capture Scanners
Fujitsu: fi-7180, fi-6400, fi-6800,
ibml: DS 1155, DS 1210, ImageTrac*

* Applies to ibml ImageTrac ScanStation

ClearVote Architecture – Inputs & Outputs

Clear Ballot

ClearDesign

Ballot Design & Programming

Accessible | Paper

ClearAccess

In-Person Ballot Marking

Ballot Marking Device | Ballot-on-Demand

ClearCast ClearCount

Ballot Tabulation

In-Person | Central Count

Inputs

1 Election Definition

Jurisdictional Info
Languages
Parties
District Categories
Precincts / Splits

Election & Related
Headers
Contests
Candidates/Choices
Vote Centers

Initial Inputs

4 ZIP HTML ADFs

Voter's intent expressed through an accessible browser user interface (e.g. tablet or PC)

Poll worker selects ballot style

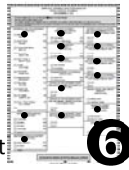
Duplex printer

Poll worker prints blank ballot for voter to mark

5 ZIP BDFs

ClearCast memory stick for results consolidation

ClearCast in-precinct voting & tabulation



6 Voters' intent expressed on paper ballots

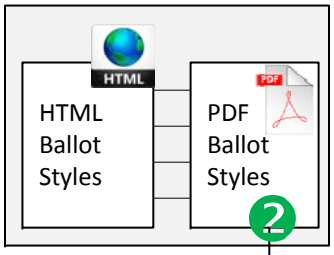
Central Tabulation & Consolidation

7

Outputs

4 ZIP HTML

Accessible Definition Files (ADFs) program ClearAccess



2

3

Interactive Ballot Proofing Reports

Ballot Printing Company

5 ZIP

Ballot Definition Files (BDFs) program ClearCast & ClearCount

Duplex printer

Ballot marking device (BMD) marked ballots

6

Voter marked ballots in-precinct, vote center or mail

Ballots cast into secure ballot boxes

7

Precinct Results

ClearCast memory stick for ClearCount results consolidation

Consolidated reports

Exports

Visualizations

ClearCast in-precinct results reporting

8 ClearCount central site consolidated election results, audit & operational reports, exports & visualizations

Final Outputs

April 26, 2016