



# Central

**Ballot Scanning and Review Software**

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## **Technical Reference Manual**

Document number 6600-003-A04

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Hart InterCivic, Inc.  
P.O. Box 80649  
Austin, Texas 78708  
Telephone: (866) ASK-HART /(866) 275-4278  
URL: [www.hartintercivic.com](http://www.hartintercivic.com)

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CHAPTER 1

Introduction

Welcome to Verity Central. The following sections provide an introduction to the Verity Central application, part of the Verity Voting system. Concepts include the general workflow, an overview of hardware and software, system security, using the interface, and next steps.

This chapter details the following introductory information:

Central Overview.....10

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# Central Overview

This section introduces the main features and requirements of Verity Central. Also, this chapter identifies the intended reader of this manual, where readers can find more information about the Verity Voting System, and some basic tools to help the user navigate Verity Central.

## About Verity Voting

Verity Voting is an Election Management System (EMS) that is used to create and tabulate ballots in an election. Verity Voting applications are used to cast votes, tabulate votes, generate reports, and display reports to either a monitor or a printer.

Using the EMS, users define election districts, precincts, contests, candidates, and so forth. The EMS stores this data in a database from which election definitions, ballots, and reports are generated.

Once ballot details are specified, ballots are proofed and accepted, at which time the election definition is created and the ballot is closed to further editing. Accepted ballots are used in elections and the election definition can be deployed on external media devices called vDrives.

The EMS captures activity in an audit log. The audit log and cast vote records (CVRs) are stored on external media devices. External media devices are used to transport election data to other certified Verity Voting applications and devices.

## About Central

Verity Central is a high volume paper ballot scanning solution designed for use in the central election office.

Ballots scanned in Central are usually by-mail ballots. Central can also be used to count polling place ballots in a central location, or to scan paper ballots and resolve voter intent issues.

Users scan ballots, complete post-voting tasks such as reviewing write-in candidates and ballots flagged with voter intent issues, and write ballots to vDrives. Central acts as a centralized compilation and processing site for final ballot handling, reading, and processing before tabulation.

Following is a general outline of Central task performance.

- Ballots are scanned in bulk. Each ballot has the front and back pages scanned simultaneously to capture all voter marks. All ballots received at polling places and via mail are scanned into digital files and compiled into batches.
- Each batch is saved with a unique ID, is designated a voting type, and may include manually added notes. Each batch is given a status based on all of the ballots in that scanned batch:
  - *Unresolved*: At least one ballot in the batch has at least one voter intent issues
  - *Resolved*: Ballot batches that do not have any voter intent issues or have had all voter intent issues resolved
  - *Written*: Ballot batches are written to vDrives as CVRs
- Once ballots are scanned, Central analyzes them to verify the validity of the ballot and to identify voter marks on the ballot. The system flags any potential voter intent issues for review. Voter intent issues may include undervotes, overvotes, write-in candidates, or invalid ballots.
- Flagged ballots are reviewed for voter intent and resolved.
- Ballots are then written as Cast Vote Records (CVRs) to vDrives. Each vDrive can hold multiple batches. A restoration backup is saved on the workstation. The saved backup allows users to create restoration vDrives to replace any lost or problematic vDrives.
- The final CVR records on vDrives are then sent to a Verity Count workstation for official tabulation.
- Ballots written to vDrives are read into Verity Count for tabulation.

Election rules mandate the performance of logic and accuracy tests (LAT), which must be repeated on each unit at least as often as before and after each election. Central *Tasks* enable a device to read the same data multiple times by storing the data in separate chunks for each task.

Central is scalable for all sizes of jurisdictions, supporting configurations for a single client-server workstation and multiple client workstations to a single server.

## How to Use This Manual

This manual is a technical reference, providing detailed overviews of application features and the user interface. This manual is not intended for training purposes or for learning best practices and procedures, nor is it intended to replace such guides.

This manual is intended for referential use by Information Technology (IT) workers who configure workstations and workers assigned to work at Central workstations.

When using this manual, users should have a general understanding of voting and voting procedures.

The Verity Voting documentation suite comprises the following:

- Verity Build Technical Reference Manual (Doc ID 6600-002 A05)
- Verity Build Quick Reference Manual (Doc ID 6620-002 A05)
- Verity Central Technical Reference Manual (Doc ID 6600-003 A04)
- Verity Central Quick Reference Manual (Doc ID 6620-003 A04)
- Verity Count Technical Reference Manual (Doc ID 6600-004 A04)
- Verity Count Quick Reference Manual (Doc ID 6620-004 A04)
- Service and Maintenance Operations Technical Reference Manual (Doc ID 6610-001 A05)
- Polling Place Operations Technical Reference Manual (Doc ID 6610-100 A04)

## Verity Central Equipment

Central is installed on a commercial off-the-shelf workstation by Hart InterCivic (hereafter, "Hart").

The Central workstation includes a monitor, keyboard, and mouse. Optionally, a report printer can be added. Both Verity Key and a vDrive are required.

Hardware equipment issues are discussed in the *Service and Maintenance Operations Manual*.

## Central-Specific Equipment

Verity Central supports the following scanning devices:

- Canon DR-G1100
- Canon DR-G1130
- Kodak i5600

These scanners enable duplex scanning with multi-feed detection.

All of the supported scanners can print on the following paper sizes:

- 8.5" x 11"
- 8.5" x 14"
- 8.5" x 17"
- 11" x 17"

Verity Central supports a minimum throughput speed of 50 sheets per minute.

Ballot definitions:

- Ballot=1-4 sheets
- Sheet=2 pages
- Page=1 side of paper

## Verity Key

Verity Key, or Key, is a small security device that is inserted in a USB port. Key is programmed for each election to ensure two-factor authentication with a user account. Specific features may require the use of the Key and passcodes to validate access.

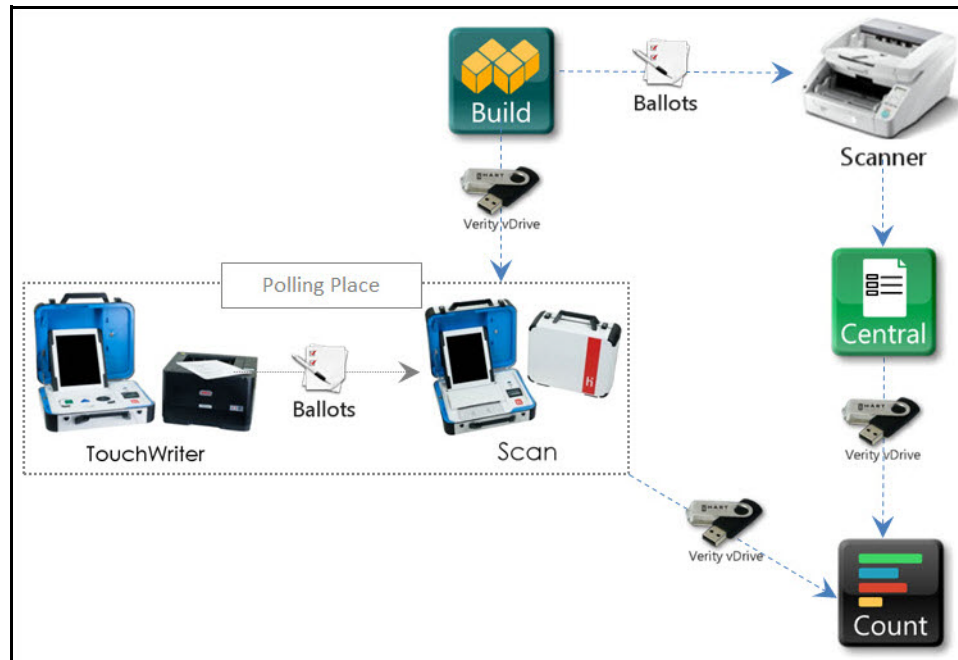
## vDrive

vDrive is a small, portable memory device. vDrives are created in Verity Build to carry the signed election definition to the Verity Voting devices, Scan and Touch Writer. vDrives are used throughout the election process to record voting device activity audit logs to ensure security, and to carry cast vote records (CVRs) forward to be resolved and tabulated.

Audit logs are recorded for all activity performed in the Verity Voting system as it occurs. Each Verity component (application or device) maintains its own audit log. Audit logs are a critical part of ensuring that security is maintained by providing an audit trail.

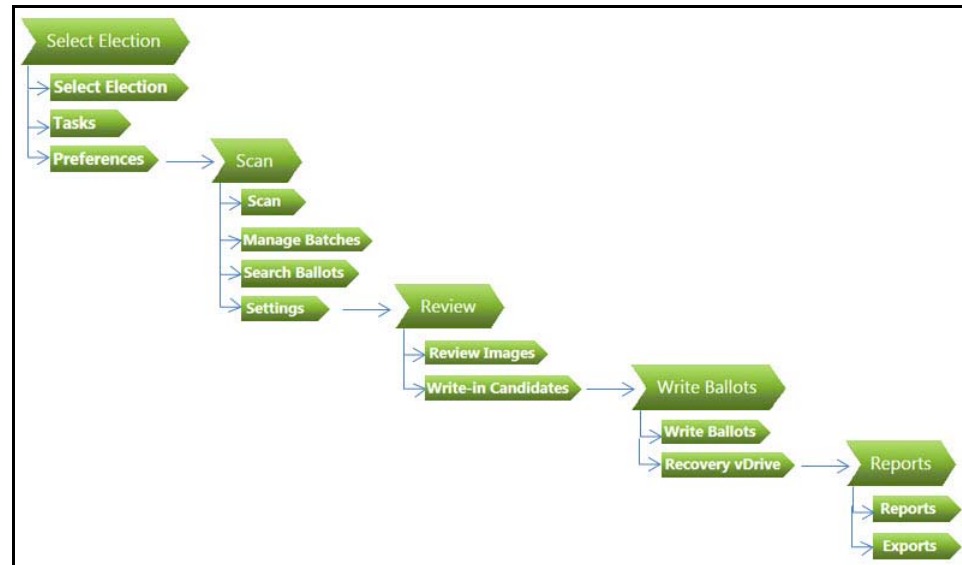
## Verity Workflow

The following image is a visual representation of the Verity Voting System and is intended to help users understand where Central functions within the system.



## Central Workflow

The following image depicts a high-level view of the Central process flow.



Users can move forward and backward through the program at any time.

Beginning with the **Select Election** chevron, users work their way through Central from the top down, following the arrows through the **Scan**, **Review**, and **Write Ballots** workflows to **Reports**.

# Verity Central Security

Proper security is critical to safeguarding the election process. Hart designed all Verity applications, including Central, with security as a core component. Secure computing functionality is implemented in these products with modern security technologies and best practices. In addition, Central has been thoroughly tested, both internally and externally by a certification lab, to ensure proper security and software functionality. Following the guidelines in this manual is very important in order to maintain voting security.

## Software Security

Central is designed for cost-effective and meaningful security solutions. To ensure security at every level, Verity Voting engages the authentication, authorization, and audit (AAA) security framework. For each of the Verity Voting software applications and voting devices, the following security elements are implemented.

### Application

At the application level, security is maintained with a secure boot process. Verity uses write-protection technologies to prevent the accidental installation of viruses and malware. Only verified applications can be installed and executed. Whitelisting prevents unauthorized programs from running on the workstation. Only authorized users can update applications.

### User Authorization and Authentication

Verity applications are designed to ensure that they are accessible only by authorized users. Authorized users, in turn, are required to identify themselves using a login name and password prior to gaining system access.

**Authorization.** Role-based permissions determine the tasks that each user can perform. Only users with the proper privileges can view or change data. User roles adhere to the principle of least privilege: user access to resources and information is limited to what is required to complete each task. Administrators assign a user role to each user, ensuring that each user has access only to the information for which that user has been granted access. (For more information about specific user roles, refer to [User Roles, starting on page 65.](#))



**Passwords and Authentication.** In addition to being assigned a user role, each user has a unique login name and password. Password management rules are modern and flexible.

When each user logs in, Central ensures that the user name and password are valid before the user can access the software. This process is critical for ensuring that proper security is maintained at all times.

User passwords for Central are configured by the administrator in each jurisdiction. Standard security best-practices are advised.

Verity Key is used to transport secrets such as passwords. User passwords for Verity Key are election-specific and user-specific.



**CAUTION:** Passwords for Verity Key cannot be recovered if they are forgotten. They can be changed only if the authorized user knows the administrator password.

For more information on passwords or user roles, see [User Management, starting on page 57](#).

## Secure Environment and Operating System

Central engages the highest level of security features and functionality. Kiosk mode ensures that users can safely perform Verity Voting tasks without inadvertently altering the operating system. In kiosk mode, users do not have access to Verity Voting workstation operating system components, preventing installation of unauthorized applications and ensuring that user access to election data is managed through only Verity Voting applications.

## Data Encryption

When workstations are operating in a networked configuration that employs a server and one or more clients, the data transfer between clients and server is encrypted.

Verity Central meets or exceeds minimum National Institute of Standards and Technology (NIST) standards for data encryption. All data transfers are encrypted with a NIST-approved algorithm that is compliant with Federal Information Processing Standards (FIPS) 140-2. FIPS ensures a security standard of encryption required by federal agencies.

## Digital Signature

Certified Verity applications digitally sign the data that is stored by Verity (that is, election definition files, vDrives, and so forth). All data transferred from a Verity application is digitally signed with FIPS-compliant hash algorithms.

## Cast Vote Record (CVR)

To protect voter privacy, CVRs are stored in randomized order so that voting order cannot be determined. CVRs do not contain voter information connecting a vote to a specific voter. The use of digital signatures makes CVRs tamper-evident. CVRs are stored in multiple locations for redundancy.

## Verity Key Security

Key is part of the Verity Voting two-factor authentication process. Two-factor authentication requires that each user have something (a programmed Verity Key) and know something (the pass code associated with the Key). Users and the Key must be authenticated. Each Verity Voting application reads the Key before allowing certain operations to occur. Some Verity Voting applications will not operate without a programmed Key. Each Key is valid for one and only one election.

## Electronic Data Transfer Functionality

Election professionals are responsible for ensuring that Verity Voting workstations have established any required network connectivity before running Verity Voting applications. Users with proper credentials are able to connect securely. Data is encrypted to prevent unauthorized access and digitally signed to verify the source of the message. This security policy is applied message-by-message in transport.

## Audit Log

Comprehensive audit logs are generated for all user authentication attempts, data transfers, configuration changes, and errors. Audit logs are designed to be complete and easy to understand. Audit logs are created uniformly across system applications, PC applications, and voting devices.

# System Requirements

Central has network- and application-specific requirements. This section discusses what is needed in order to run Central over a network.

## Verity Voting Network

Central can be installed in different configurations. It can be installed on a standalone workstation, or it can be configured as a server-client network. The network connection type and settings are managed in the workstation operating system. Central uses a TCP/IP connection and supports the following connection types:

- Network speeds of 100Mb/s-1Gb/s
- Wired TCP/IP
- Ethernet

Hart pre-configures the network settings for Verity workstations, and these settings should not be changed.

## Central Application

Each time Central starts, Central requires authorized users to log in with a valid user name and password. If user credentials are incorrect, the user is notified and is required to enter valid credentials before Central grants the user access to Central functionality.

Once authentication is confirmed, Central grants access to users depending on each user's assigned role. User roles are assigned when the user is added to Verity. For more information on user roles, see [User Management, starting on page 57](#).

# Verity Application Installation

Verity applications are installed only on Hart-approved workstations. Installation is performed by a Hart IT professional.

# Navigating Central

Central incorporates an intuitive user interface that was designed for time efficiency and ease-of-use. In this section, several basic Central navigation tools are described.

## Workflow Chevrons

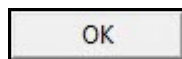
All of the Verity applications display chevrons for each workflow. Workflow chevrons identify the function the user is currently viewing.



In the above example, the **Select Election** workflow chevron is highlighted, indicating that the user can complete tasks associated with the Select Election workflow. In Verity Voting applications, users can switch views and corresponding functionality by clicking a different chevron.

## Buttons and Icons

Central, like all Verity Voting applications, uses familiar buttons and icons. Buttons may include text to easily identify each button's purpose. For example, the **OK** button enables users to accept the currently displayed options or conditions.



Clicking the **OK** button enables users to continue forward with their work.

Note that a button that is more pale, or dim, compared to its active counterpart, is an inactive button.

For a complete list of Central buttons, see [User Interface Buttons, starting on page 161](#).



## Match Case Button

The **Match Case** button filters options by case (that is, uppercase or lowercase).



Users can click the **Match Case** button beside text boxes in order to invoke case matching for the filter.

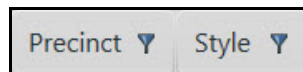
## Expand/Collapse Button

On some lists in the Verity Voting system, users may see the **Expand**  button. Clicking the **Expand** button expands, or opens, the selected item to display further details. Once the **Expand** button is clicked, the image changes to the **Collapse**  button. Clicking the **Collapse** button collapses, or closes, the detail region.

## Sort and Filter Bar


Many of the Verity software applications employ the **Sort and Filter** feature to display data in a specific order. This section describes the **Sort and Filter** functionality that can be applied to context-specific data lists as they are used throughout Verity Central.

Following is an example of a **Sort and Filter Bar**. These are usually found at the top of lists.





To sort the list by a column heading, click the heading. To reverse sort order, click again. In order to see the change in sort order, at least two items must be displayed in the list.

## Custom-Filter Icon and Drop-Down Lists

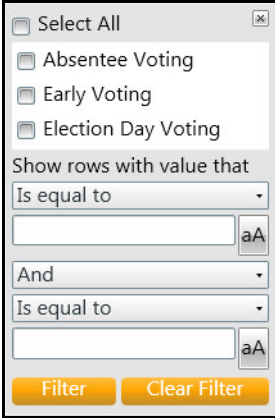
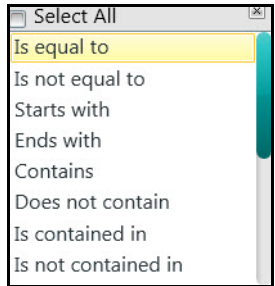
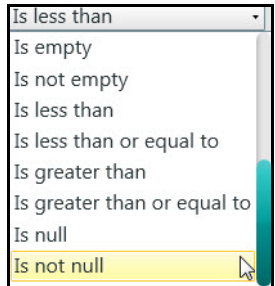

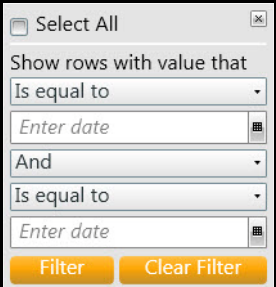
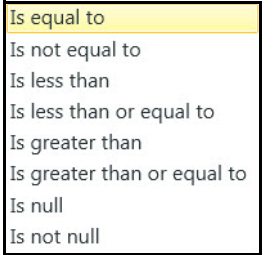
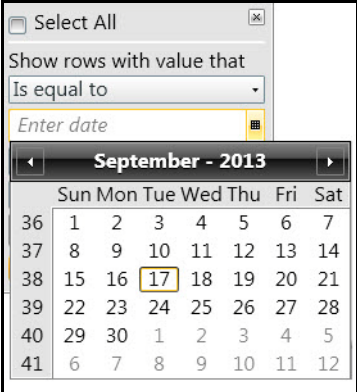
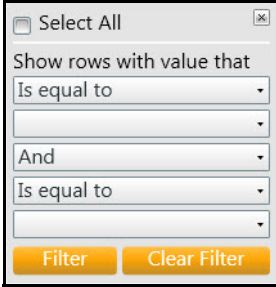
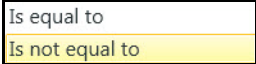
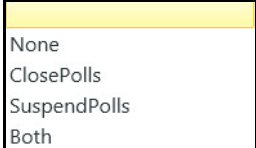
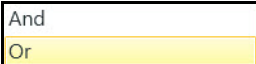
Clicking the **Custom-Filter** icon  opens the **Custom-Filter** drop-down dialog box. Each **Sort and Filter Bar** label has a **Custom-Filter** drop-down dialog box that users can customize to achieve specific custom-filter results.

Each filter icon is blue when inactive (the default). The filter icon turns yellow to identify the label currently being filtered.

Inactive Filter Icon	Active Filter Icon
	

## Sample Filter List

Clicking a **Filter** icon displays the drop-down list of filter options. List options are context-sensitive and vary by location. Following are examples.

Sample	Sample	Sample
   	  	   

Note that this list is a sample list and is not intended to be exhaustive.



## Filter and Clear Filter Buttons

Clicking the **Filter** button filters the data and displays the results based on the selected filter options.



Users can click the **Clear Filter** button to reset filter options and clear any selections made.



## Other Navigation Options

Central utilizes other commonly used and familiar navigation options to enhance the user experience.

### Selecting Multiple Items in a List

Where more than one item in a list can be selected at the same time, users can click one item, press and hold the **Ctrl** key, and then continue clicking other items in the list. Each selected item is highlighted. To select all of the items in a range of items, users select the first item in the range, press and hold the **Shift** key, and then select the last item in the range. All items in the selected range are highlighted to indicate that they are selected.

### Scrolling

Some of the panes in Verity applications contain more information than fits in the window, particularly when the zoom function is engaged. Users can scroll to view all of the data by clicking and dragging the scroll bar or by clicking in the gray scrolling region.

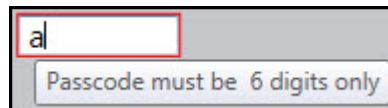


## Text Boxes

Text boxes identify specific regions on the screen in which users can type text. Text boxes are labeled so that the expected content for each text box is clearly identified.

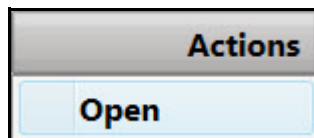


If users make a mistake when entering characters in a text box, the text box is lined in red. Moving the cursor inside the text box displays the corresponding error message, such as the error in the following example.



## Drop-Down Lists

Another common navigation technique incorporates a button with a list to form a drop-down list. Clicking the labeled button causes a list of options to be displayed. Users click the button to display the list and then click to select the item in the list.

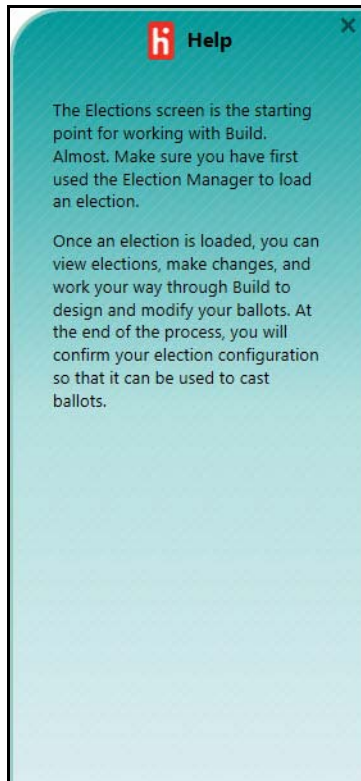


## Help Button

All Verity applications include a **Help** button in the lower-left corner of the screen.

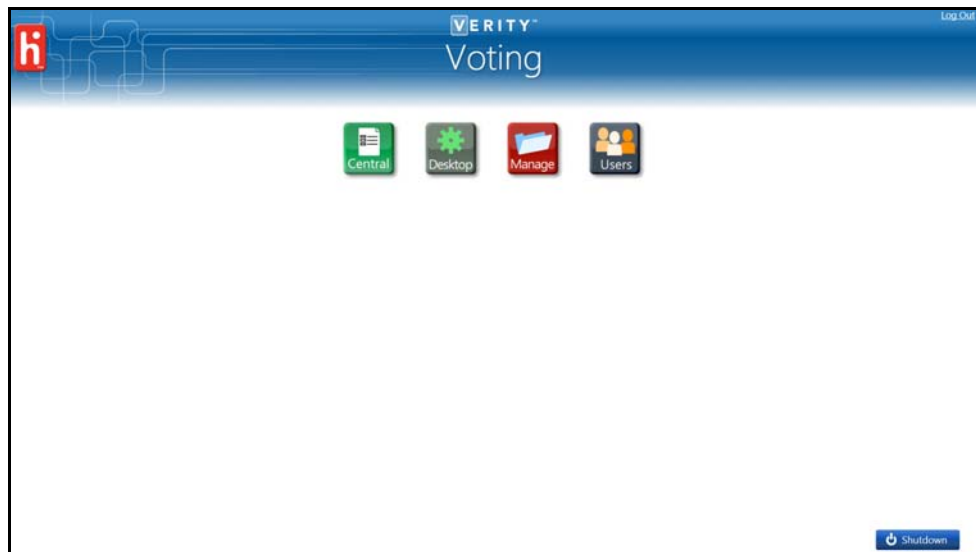


Clicking the **Help** button expands context-sensitive Help tips.



## Next Topics

In order to use Central, users must first use Election Management to import elections and User Management to set up users in the Verity Voting environment. Tiles to access these functions appear beside the Central tile on the application launcher screen. Once those tasks are complete, users can use Central. The following image (example taken from Verity Central), depicts other applications available in Verity Voting.



To change the time on the workstation, to export file hashes, or to access the operating system, administrators use the tools in Desktop. For more information, see [Desktop, starting on page 29](#).

To import elections in Central, administrators use the Election Management application. For information on managing election definitions, see [Election Management, starting on page 39](#).

To add or alter user profiles, administrators use the User Management tool. For information on creating and managing user accounts, see [User Management, starting on page 57](#).

Once elections have been imported and users have been created, users can begin using Central.

To begin using the Central application, see [Getting Started with Central, starting on page 75](#).

CHAPTER 2

Desktop

Every Verity application has access to the Desktop tool. Desktop is one of the three Verity tools that is common to Build, Central, and Count. Therefore, this chapter discusses Desktop from a bird’s-eye view, including all Desktop functionality for all applications. Only Desktop Administrators can see the tile for and interact with the Desktop application.

This application allows users assigned the Desktop Administrator role to set workstation date and time, export file hashes to a removable drive, and enter a password for accessing the operating system.

This chapter details the following introductory information:

Overview..... 30

Desktop Screen ..... 31

Setting the Clock..... 32

Exporting File Hashes..... 34

Entering an OS Code ..... 36

Closing Desktop..... 37

# Overview

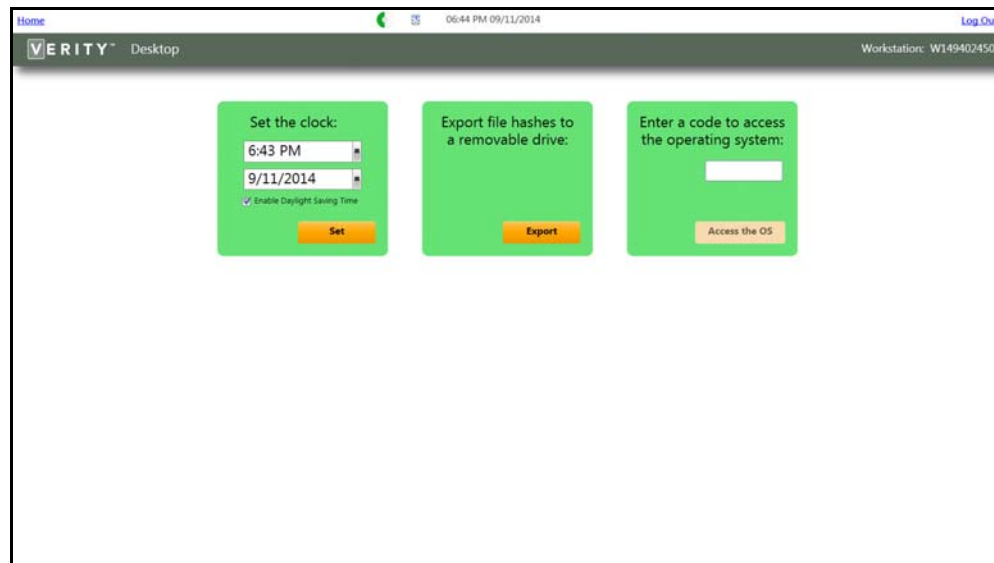
Verity Desktop allows users with Desktop Administrator access the ability to set the computer date and time, enable or disable daylight savings time, export file hashes to a removable drive (perform software validation), and enter an operating system access password.

Desktop access depends on user roles and permissions. Desktop is accessed by clicking the **Desktop** tile.



# Desktop Screen

Clicking the **Desktop** tile opens the Desktop application and displays the **Desktop** screen.



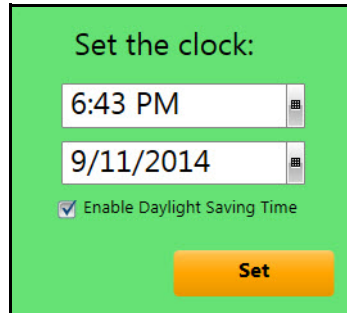
The **Desktop** screen contains the following:

- **Set the clock:** defaults to current system time
- **Export file hashes to a removable hard drive**
- **Enter a code to access the operating system**

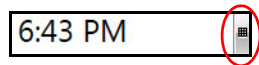
These are discussed in the following sections.

# Setting the Clock

Desktop Administrators can set the time and date on the computer.



Clicking in the hours:minutes time box, and then typing over the current time changes the time. Users must retain the hh:mm time configuration. Variations are not accepted.



Workstations do not use a 24-hour clock, so administrators can type over the AM or PM text to change it, or they can select a time with an AM or PM assignment by clicking the drop-down icon to the right of the time display.



Clicking the time icon displays the time selection box.




Clicking a time closes the box and resets the time to the selected option.

Clicking the **Set** button saves any changes.



The date can also be adjusted on workstations. Users can change the date by typing a new date over the old date using the format mm/dd/yyyy (with slashes).

9/11/2014 

Alternatively, users can change the date by clicking the calendar drop-down icon to display the calendar.

September - 2014							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat
36	31	1	2	3	4	5	6
37	7	8	9	10	11	12	13
38	14	15	16	17	18	19	20
39	21	22	23	24	25	26	27
40	28	29	30	1	2	3	4
41	5	6	7	8	9	10	11

Clicking on a date in the drop-down calendar closes the calendar and displays the new date.

**Note:** Supported dates are 1/1/2009 to 12/31/2037.

Most regions adapt their clocks to Daylight Savings Time. Adjusting the clock to or from Daylight Savings Time is accomplished by clicking to check ☒ or clear ☐ the Daylight Savings check box.


Clicking **Set** saves any changes.

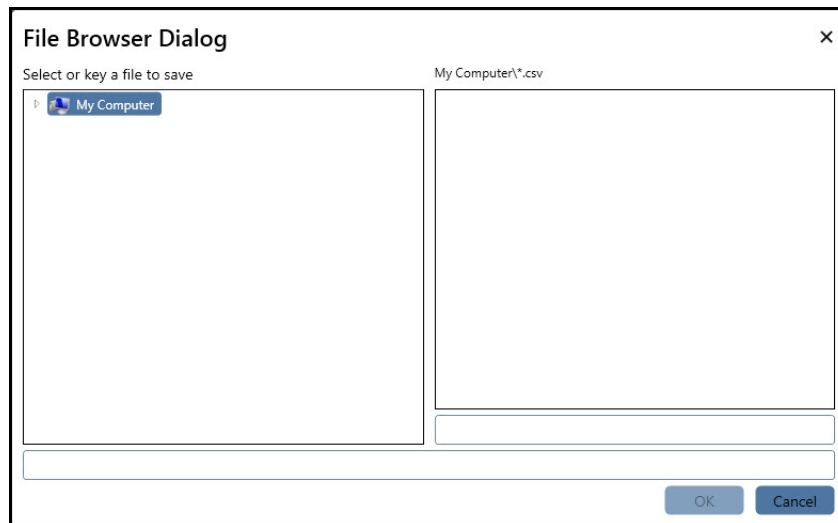


# Exporting File Hashes

The **Export File Hash** box is for generating the file manifest on the Trusted External Interface. Desktop Administrators can export files to a removable drive in order to verify that the software installation is identical to the certified software.

To generate the file manifest, users will perform the following steps:

1. First, users contact Hart Customer Service and Care.
2. Then users insert a USB portable drive into one of the workstation's USB ports.
3. Once the USB drive is installed, users log into the Verity application launcher.
4. Then users launch the Desktop application.
5. In the **Export file hashes to removable drive** dialog box, users select the **Export** button. Clicking the **Export** button  displays the **File Browser Dialog** window. Clicking **Cancel** in the **File Browser Dialog** window closes the window without exporting.



6. Users select a location and click the **OK** button.
7. Users then allow the system to write the manifest file to the USB drive.
8. Users remove the USB drive from the workstation.
9. Then users retrieve Verity file manifests from the NSRL reference files from the NSRL Voting website <http://www.nsrl.nist.gov/vote.html>

10. Using Notepad, Excel, or WinMerge, users will manually compare the Verity Manifest file provided by the NSRL to the manifest file stored on the USB drive.

The comparison should indicate that the file names, file versions, and file checksums are identical.



# Entering an OS Code

The third activity available on the Desktop screen is accessing the operating system.



When the Desktop window is opened, the **Access the OS** button is dimmed. Clicking in the **Access Code**  text box and then typing the access code activates the **Access the OS**  button. If the code entered is correct and active, the system exits kiosk mode and allows the user to access the operating system.

Codes to access the desktop are distributed by Hart Customer Support Center representatives as needed for one-time usage. The alphanumeric code cannot be used beyond the designated time interval, and Desktop Administrators must call the Customer Support Center for another code.

**Note:** When the term “alphanumeric” is used to define allowed values, it means the following Unicode characters are supported: 0x09,0x0A,0x20-0x7F,0xA1, 0xC1, 0xE1, 0xC9, 0xE9, 0xCD, 0xED, 0xD1, 0xF1, 0xD3, 0xF3, 0xDA, 0xFA, 0xDC, 0xFC, 0xAB, 0xBB, 0xBF.

You must shut down and restart the workstation to use Verity once again:

1. Select the **Shutdown** option from Windows.
2. Once the workstation is shutdown, press the power button on the workstation to start the workstation and launch Verity.

**Note:** For networked configurations, see the Verity Network Troubleshooting section for proper network shutdown procedures.

# Closing Desktop

Users can close **Desktop** in one of two ways: by clicking the **Home** link or by clicking the **Log Out** link. Clicking **Log Out** [Log Out](#) logs the Desktop Administrator out of the application and launcher entirely, and returns to the **Verity Voting** log in screen. Clicking the **Home** link [Home](#) returns the user to the **Verity Voting** application launcher screen, from which the Desktop Administrator can choose to work with another application. The **Verity Voting** log in and **Verity Voting** application screens are discussed in detail in Chapter 6, Getting Started with Central.

## Next Topic

To import elections in Central, administrators use the Election Management application. For information on managing election definitions, see [Election Management, starting on page 39](#).

# Notes

CHAPTER 3

Election Management

Every Verity application has access to the Election Management tool. This tool allows Election Management Administrators to manage elections. Election Management is one of the three Verity tools that is common to Build, Central, and Count. Therefore, this chapter discusses Election Management from a bird’s-eye view, including all Election Management functionality for all applications.

Because Election Management functionality is context-sensitive and application-dependent, not all functions described in this chapter are available to every Verity application.

This chapter details the following information:

Overview..... 40

Election Management Screen ..... 43

Managing Elections..... 44

# Overview

Election Management allows users with the role of Election Management Administrator to import, import signed, export signed, archive, restore, rename, maintain the database for, and delete existing elections.

**Note:** The Election Manager tile will not display on a networked client workstation.

The Election Management application is accessed through the **Manage** tile on the **Verity Voting** launcher screen.




All elections are managed through this application. Users of other Verity Voting applications also installed on the workstation or network can access elections through the **Select Elections** screen. **Select Election** and other screens are discussed in the chapters that follow, beginning with [Getting Started with Build, starting on page 79](#).

## A Word About Removable Media Devices

Working with external media devices requires a solid connection. When using vDrives, users should ensure that they are properly inserted and firmly seated. While using any Verity application, if users receive an error message stating that there is a problem with the vDrive, they should remove the vDrive, wait a moment, and then reinsert it. If, after a few attempts the vDrive still triggers an error message, users should contact Hart Customer Support Center for a replacement vDrive.

**Note:** Only Hart approved, formatted, and distributed devices should be used.

## Actions Button

The **Actions** button  is located on the **Election Management** screen. Clicking the **Actions** button displays the **Actions** drop-down list.



The tasks displayed in the list are application-dependent. While this chapter discusses all of the tasks, the user interface for each application includes only the tasks relevant to that application.

Within each application, the available tasks in the **Action** list are in boldface text, and the unavailable tasks are dimmed. Activating dimmed Action list options is accomplished by clicking an election.

The following example, taken from Verity Build, contains most of the tasks. Because the list is application-dependent, the **Import Signed** option does not display. Verity Build does not allow signed election importing; only Central and Count users can import signed elections. The **Import Signed** function is discussed later in this chapter.



This menu is context sensitive, meaning that the Actions listed below may or may not be accessible by the user depending on the currently selected election data.

- **Rename:** (all applications) Renames the selected election. The election ID does not change.
- **Delete:** (all applications) Removes the selected election from the election list and the workstation or network. Hart recommends archiving before deleting an election in order to mitigate issues related to unintended deletion.
- **Import:** (Build) Imports an unsigned election.
- **Import Signed:** (Central and Count) Imports a signed election.
- **Export Signed:** (Build) Exports and signs the finished and accepted election. Only Build can create an election definition and export the signed election. Signed elections are used in Count and Central.

**Note:** External mass storage devices used to archive or export data from Verity should be formatted as NTFS.

- **Archive:** (all applications) Creates an archival copy of the election, including the current snapshot of all election data, election definition, audit logs, tasks, and so forth. The election status does not change.

- **Restore:** (all applications) Restores the archived election without changing the election status. An archive can be restored only for the system on which the archive was created.
- **Maintenance:** (all applications) Runs a database optimization program to ensure that Verity runs quickly and efficiently.

The following table shows which features are available in each of the Verity applications.

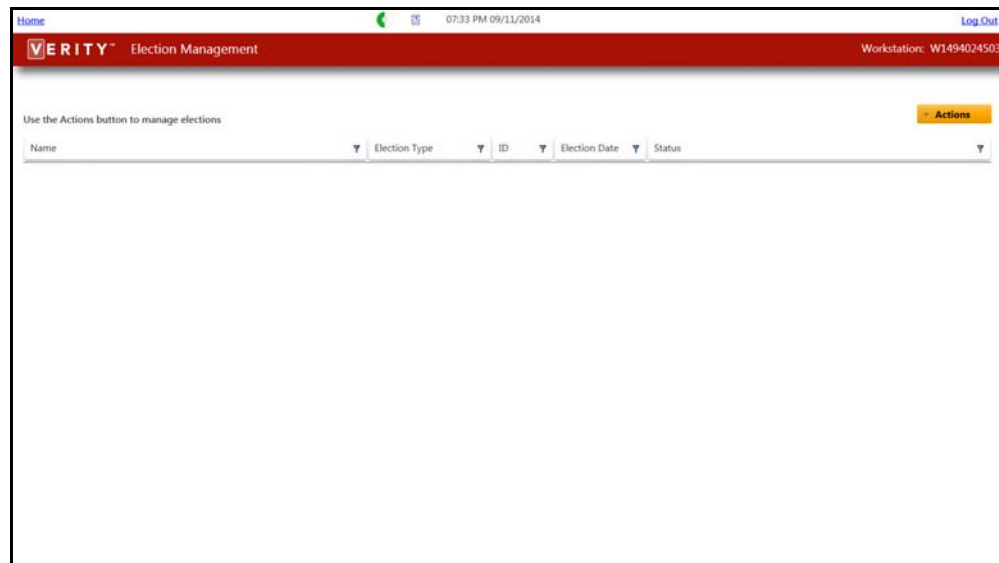
Action	Build	Central	Count
Rename	x	x	x
Delete	x	x	x
Import	x		
Import Signed		x	x
Export Signed	x		
Archive	x	x	x
Restore	x	x	x
Maintenance	x	x	x

## Closing Election Management

Users can close **Election Management** in one of two ways: by clicking the **Home** link or by clicking the **Log Out** link. Clicking **Log Out** [Log Out](#) logs the user out of the application and launcher entirely, and returns the user to the **Verity Voting** log in screen. Clicking the **Home** link [Home](#) returns the user to the **Verity Voting** application launcher screen, from which the user can choose to work with elections, Desktop, Election Management, or User Management, depending on the user's assigned user role. The **Verity Voting** log in and **Verity Voting** launcher screens are discussed in detail in [Getting Started with Build, starting on page 79](#).

# Election Management Screen

Clicking the **Manage** tile opens the Election Management application and displays the **Election Management** screen.



The **Election Management** screen contains the following:

- **Elections** list
- **Actions** drop-down list

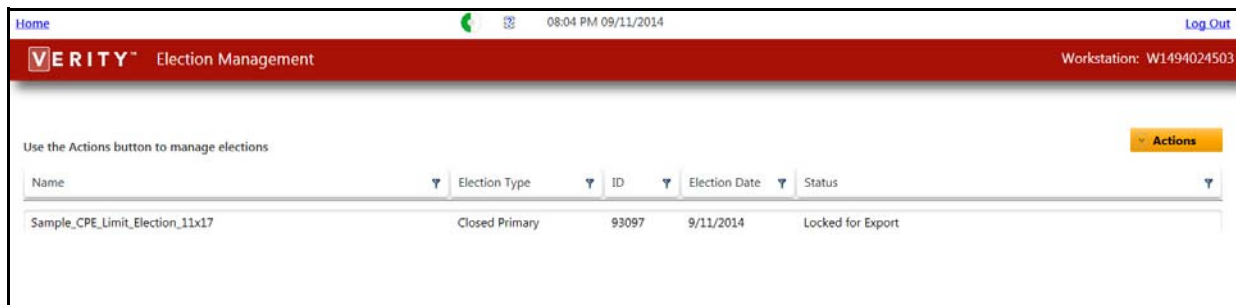
These are discussed in the following sections.

# Managing Elections

The **Election Management** screen contains an elections list. A blank screen indicates that no elections have been added or loaded.



Any elections currently installed in the Verity system are displayed on the **Election Management** screen.



Each election contains the following data:

- **Name:** The Name can be configured by users.
- **Election Type:** Choices are General, Closed Primary, and Open Primary.
- **ID:** Each election has a unique ID number in the form [xxxxx].
- **Election Date:** The Election Date can be configured in Verity. The default in Election Management is the current date.
- **Status:** The Status indicates whether or not the election can be altered in the current application. Verity application statuses change automatically. For example, in Verity Build, elections are opened with the status of *Locked for Export*. At the end of the Build workflow, the election is accepted and the election status becomes *Accepted*, which means it is closed to further edits.

The processes in the **Actions** drop-down list are documented in the order in which they appear. When performing these operations, however, note that elections must first be exported from one application before they can then be imported in another. An election must be imported before it can be altered.

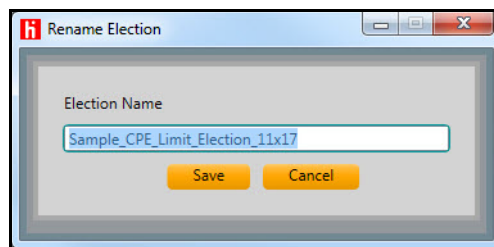
## Renaming an Election

Renaming an election does not modify the election ID or other important aspects of the election. It only changes the name label.

Users can rename an election by selecting an election, clicking the **Actions** button, and then selecting **Rename** from the drop down list.



The **Rename Election** window opens.



Users can type a new election name of up to 50 alphanumeric characters. Clicking **Save** saves the election with the new name and closes the Verity Dialog window. Clicking **Cancel** closes the window without saving changes.

When an election is renamed, the change is applied across all Verity applications in the same system. The system can include a stand-alone application workstation or multiple application workstations on a network.

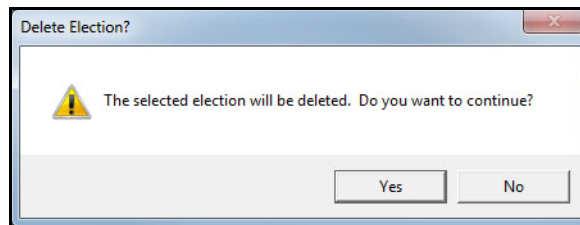
## Deleting Elections

When deleting an election, the user removes it permanently from the Verity Voting system. Hart recommends performing an archive of the election data prior to removal. If the election is needed for further tasks or report generation, the archived election can be restored.

To delete an election, users select an election, click the **Actions** button, and then select **Delete** from the drop-down list.



The **Delete Election** dialog window displays.

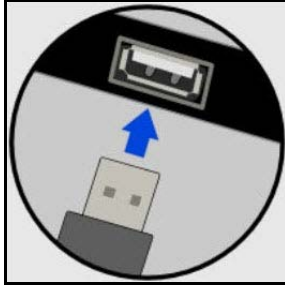


Clicking **Yes** deletes the election and closes the window. Clicking **No** closes the window without deleting the election.

## Importing Elections

The **Import** option imports election data that has been formatted in a manner that is compatible with published file specifications. Only Build users can import unsigned elections. Central and Count require that elections be signed prior to import.

Before importing an election, an external media device containing election data must be connected to a USB port.

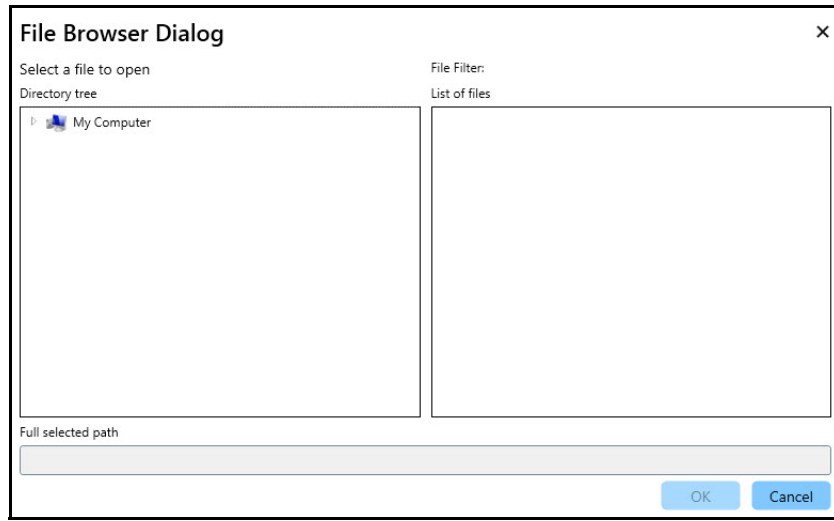


**Note:** The external media device cannot be named "VDRIVE"; if the device is named "VDRIVE" it will not be displayed in the Directory Tree list in the File Browser Dialog box.

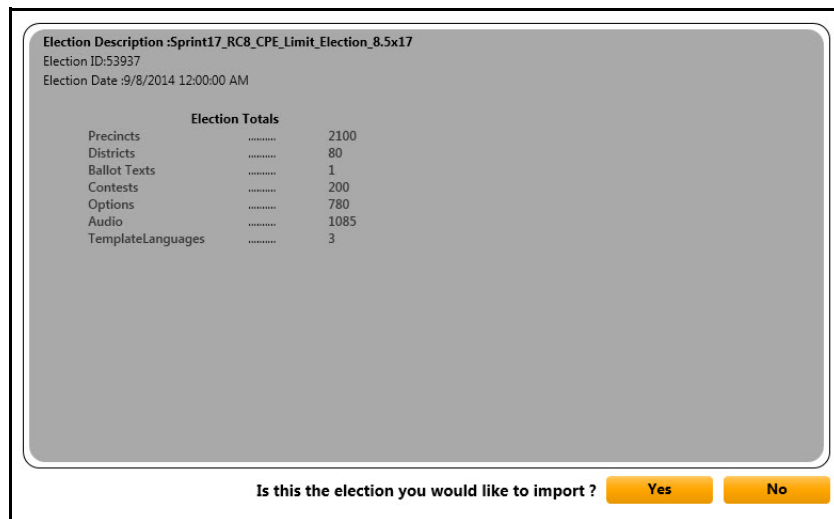
To import an election, users select an election, click the **Actions** button, and then select **Import** from the drop-down list.



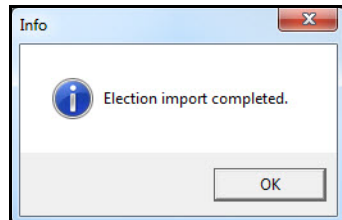
The **File Browser Dialog** window from which users can navigate to the desired file.



Clicking **Cancel** in the **File Browser Dialog** window closes the dialog window without importing the election. Clicking **OK** imports the election and closes the dialog window. A confirmation window displays.



Clicking **No** closes the window without completing the import. Clicking **Yes** opens the **Info** window. Clicking **OK** closes both windows.





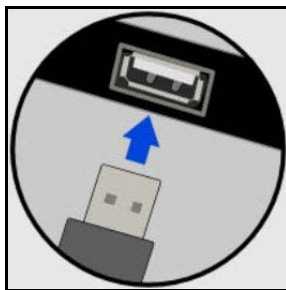
## Importing Signed Elections

The **Import Signed** option imports a signed election from an external media device. Central and Count both require that elections be signed prior to import because signed elections are tamper evident. Only Build creates a signed election for import into Central and Count. Once signed, the election becomes the election definition and is closed to further edits in Verity.

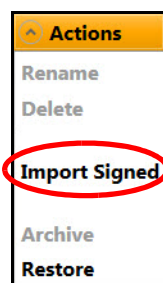
Signed elections are exported to a media device on a Build workstation. For more information, see [Exporting Signed Elections, starting on page 51](#). The media device is brought to a Central or Count workstation for the signed election to be imported through Election Management.

**Note:** Signed elections must be exported to a media device using the same workstation that created the vDrive and Key.

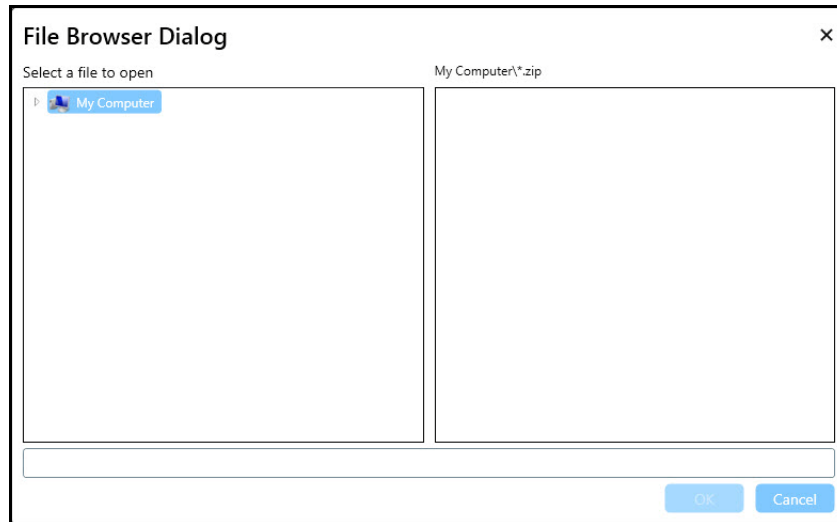
Users begin by inserting both Verity Key and the external media device containing their election into USB ports on their workstations.



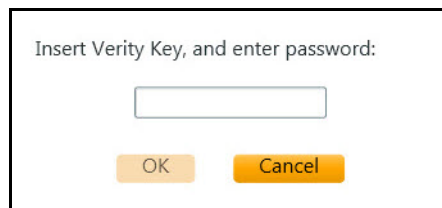
Clicking **Actions** displays the drop-down list.



Selecting **Import Signed** displays the **File Browser Dialog** window.

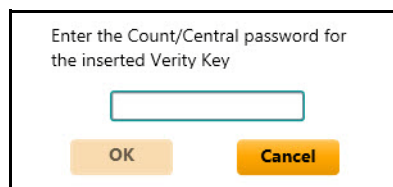


Users navigate to the location from which they want to import the signed election and then click to select the election .zip file. Clicking **OK** imports the signed election and closes the window. Clicking **Cancel** closes the window without importing an election. Clicking **OK** displays the **Insert Verity Key** dialog window.

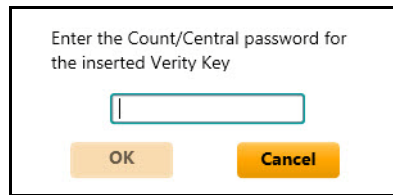


Typing a character activates the **OK** button. Typing the correct password and clicking **OK** imports the signed election and closes the window. Clicking **Cancel** closes the window without importing the election.

If a Key was already inserted, the **Enter Password** window displays.

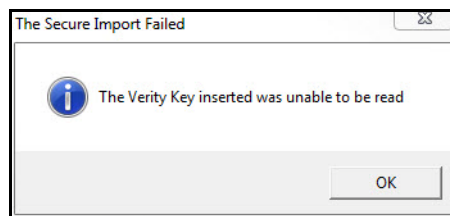


Clicking **OK** displays a user verification window into which the user must type a valid password.



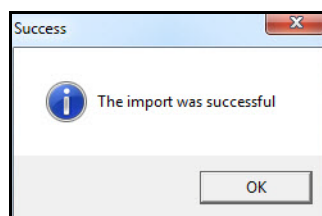
For both windows, clicking **Cancel** closes the window without importing the election. Typing a character in either password text box activates the **OK** button. Clicking **OK** causes the application to run a verification test on the user and password. If valid, the window closes and the signed election is imported.

If the Verity Key is not valid for the signed election being import, the signed election was exported from a workstation other than the one used to create the vDrive and Key, or another problem exists, the **Secure Import Failed** window displays the issue that is preventing the signed election from being imported.



Clicking **OK** closes the window without making any changes.

When a signed election is successfully imported, a confirmation window displays.



## Exporting Signed Elections

When an election has been reviewed, approved, and marked as accepted in Build, it becomes the election definition and is closed to further edits. When it is exported, the signed election includes signature files, the election definition file, and associated image, audio, and template files.

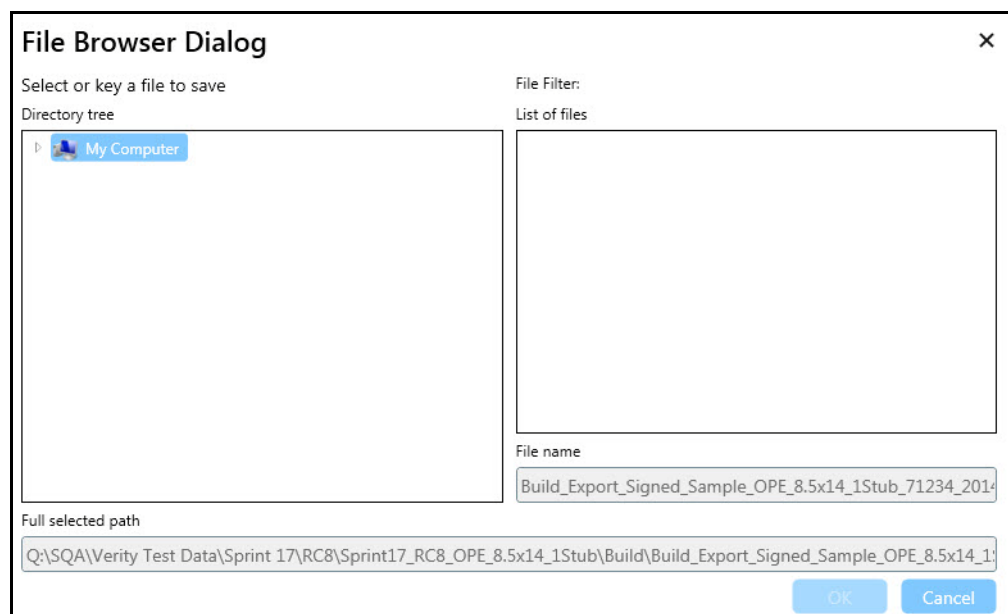
All signed exported elections are saved to an external media device for transport to and import into Election Management for other Verity applications. Signed elections exported from Build are imported into Central and Count as signed imports.

**Note:** Signed elections must be exported to a media device using the same workstation that created the vDrive and Key.

In Election Management, users select the election they want to export. Users click **Actions** and then **Export Signed**.



This opens the **File Browser Dialog** window.



Users navigate to the external media device to which they want to export the signed election. Clicking **OK** exports the signed election and closes the window. Clicking **Cancel** closes the window without exporting.

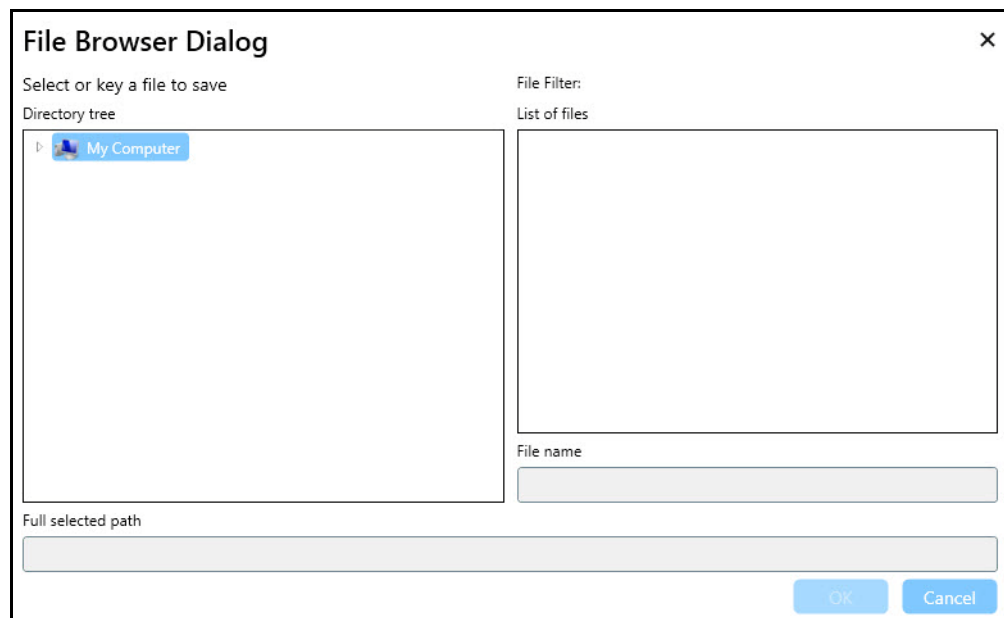
## Archiving Elections

When an election definition is archived, all of the information for the election is saved as a compressed file with the extension *.vArchive*. Archived files are used for backup, data retention, and disaster recovery. The archived election definition can be *restored* later.

Selecting an election from the elections list in Election Manager and then clicking the **Actions** button displays the **Actions** drop-down list.



Selecting **Archive** displays the **File Browser Dialog** window.



The **Archive** feature automatically generates a file name. Users can customize the file name by typing over the auto-generated name.

Clicking **OK** archives the election definition and closes the **File Browser Dialog** window. Clicking **Cancel** closes the window without archiving.

Archiving an election does not change the election status.

The archived election includes the following data:

- **Election Data File:** The name of the file uses the name of the election. This XML file contains every configured option for the election.
- **Signature Files:** All archives are digitally signed.
- **Audio Files:** These are the sound files created for audio ballots.
- **Image Files:** The image files uploaded when creating the election can include party images, seals, and images for instructions, contests, and choices.
- **Template Files:** Specific templates used by Build for defining ballot fonts, sizes, and layout.

## Restoring Elections

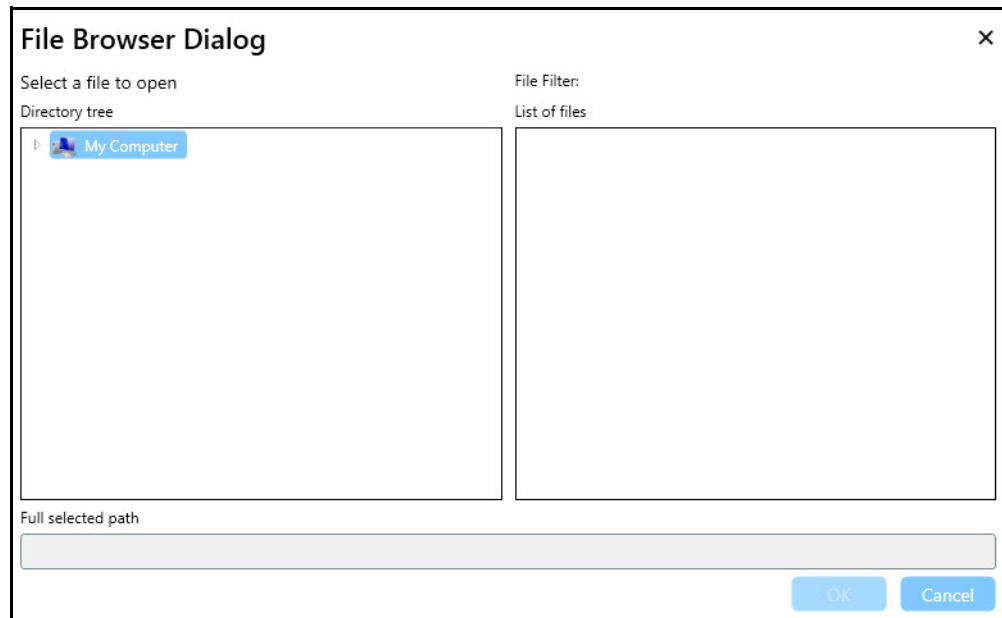
Restoring an election loads the election from an archived copy into Verity. Archived files are used for backup, data retention, and disaster recovery.

Once an election is archived, it can be deleted from the **Elections** list in Verity applications. To use that election again in the state it was in at the point it was archived, the election must be restored.

From the **Election Management** screen, users select **Actions** to display the **Actions** drop-down menu.



Clicking **Restore** displays the **File Browser Dialog** window.



Users navigate to the election .vArchive file they want to restore. Clicking **OK** restores the file and closes the **File Browser Dialog** window. Clicking **Cancel** closes the window without restoring the file.

The status of the restored election is not changed upon restoration.

## Maintaining the Election Database

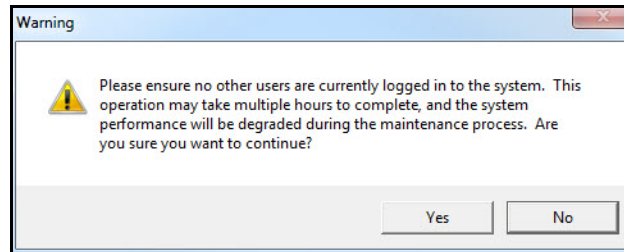
The **Maintenance** operation cleans up the database so Verity can run faster.

**Note:** Ensure that all users are logged out of Verity before running the Maintenance program. If a user is not logged out of Verity, the Maintenance program will not complete its tasks.

On the **Election Management** screen, users can click the **Actions** button to display the **Actions** drop-down menu.



Selecting **Maintenance** displays the **Warning** dialog window.



Clicking **Yes** launches the **Maintenance** program. Users may see a rotating progress wheel while Verity performs maintenance, or they may see nothing at all, depending on how long the operation takes. Clicking **No** closes the **Warning** window without running **Maintenance**.

## Next Topics

To add or alter user profiles, administrators can use the User Management tool. For information on creating and managing user accounts, see [User Management, starting on page 57](#).



CHAPTER 4

User Management

Every Verity application has access to the User Management tool. User Management is one of the three Verity tools that is common to Build, Central, and Count. Therefore, this chapter discusses User Management from a bird’s-eye view, including all User Management functionality for all applications.

Because User Management functionality is context-sensitive and application-dependent, not all functions described in this chapter are available to every Verity application.

Every Verity application has access to the User Management application. This tool enables users with the correct role and permissions to create and manage user accounts. User roles vary depending on the application.

This chapter details the following introductory information:

Overview..... 58

User Management Screen ..... 61

Managing Users..... 62

# Overview

User Management provides Administrators with the ability to create and manage Verity Voting system user accounts. Administrators can create user accounts and passwords, assign and change user roles, lock and unlock user accounts, and set user account options.

User Management is accessed through the **Users** tile.



All user accounts for the local workstation are accessible through this tool. Newly created user accounts are accessible on the workstation on which they were created and across all networked workstations.

The roles displayed in User Manager are Verity application-dependent. The Verity Voting system auto-detects the application(s) installed on the workstation to determine the proper roles to display on the User Management screen.

## User Roles

The functions allowed for each user are dependent upon the access granted through user roles. User roles are Verity application-dependent. The following sections define the user roles available in each Verity application.

### Build User Roles

Verity Build user roles are as follows:

- **Viewer:** Viewers can open elections, preview ballots and audio, and print reports.
- **Media Creator:** Can perform all Viewer tasks. In addition, can create Keys and vDrives, and can print ballots.
- **Operator:** Can perform all Media Creator tasks. In addition, can configure and accept elections. Only one Operator can open an election at a time. Once election is accepted, settings are read-only.

## Central User Roles

Verity Central user roles are as follows:




- **Central Resolution Board:** Can open elections and tasks and can resolve ballots
- **Central Admin:** Has administrator access to Central and can perform all operations with unrestricted access
- **Central Operator:** Can perform all operations except configuring preferences and settings
- **Central Viewer:** Can select elections and tasks; can generate, view, print, and export reports

## Count User Roles

Verity Count user roles are as follows:

- **Operator:** Users can open and manage elections and tasks, generate reports, and update polling place data, and precincts. Users can import and export data, resolve ballots, and access the audit dashboard. Users cannot manually record votes.
- **Election Media Reader:** Users can open elections and tasks to read media associated with elections. Users can read vDrives into the system.
- **Administrator:** Users have unrestricted access to all aspects of Verity Count. Users can manually record votes, access all aspects of reports and the auditing dashboard, and import and export data.

## User Manager Buttons

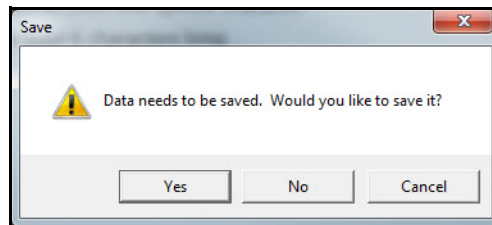
Along the bottom of the screen are the **Add**, **Delete**, and **Save** buttons. Users click the **Add** button  to create a new user. Clicking a user line item and then clicking the **Delete** button  deletes the user from the list and the application. Clicking the **Save** button  saves any changes.



## Closing User Management

Users can close **User Management** in one of two ways: by clicking the **Home** link or by clicking the **Log Out** link. Clicking **Log Out** [Log Out](#) logs the user out of the application and launcher entirely and returns the user to the **Verity Voting** log in screen. Clicking the **Home** link [Home](#) returns the user to the **Verity Voting** application launcher screen, from which the user can choose to work with elections, Desktop, Election Management, or User Management, depending on the assigned user role. The **Verity Voting** log in and **Verity Voting** launcher screens are discussed in detail in [Getting Started with Build, starting on page 79](#).

Closing User Management without first clicking **Save** displays the **Save** window.



Clicking **Yes** closes User Management and saves any changes. Clicking **No** closes User Management without saving any changes. Clicking **Cancel** cancels the **Home** or **Log Out** request, and keeps User Management open.

# User Management Screen

Clicking the **Users** tile opens the User Management application and displays the **User Management** screen.

Home Log Out 01:39 PM 09/12/2014 Workstation: W1494024503

**VERITY** User Management

Manage users with the grid below.  
Expand a user entry to assign roles.

Username	Set New Password	Account Locked?
bscheibler		<input type="checkbox"/>
jmillar		<input type="checkbox"/>
jvaldez		<input type="checkbox"/>
roman		<input type="checkbox"/>
user		<input type="checkbox"/>

**Set rules that apply to all users:**

- ☒ Lock accounts after 3 failed login attempt(s)
- ☒ Allow locked accounts to login after 20 minute(s)
- ☒ Force password change every 1 month(s)
- ☒ Log idle user out after 20 minute(s)

**Password complexity rules**

- ☐ Must contain at least one upper-case character
- ☐ Must contain at least one numeric digit
- ☐ Must contain at least one special character
- ☒ Must be at least 6 characters long

Add Delete Save

The **User Management** screen comprises the following:

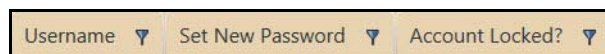
- User accounts
- Rules
- Buttons

These are discussed in the following sections.

# Managing Users


On the left side of the screen is the **Manage Users** list, which contains a list of all of the user accounts established on the workstation. User accounts must be created in each Verity application and do not travel system to system.


At the top of the **Manage Users** list is the **Manage Users Sort and Filter Bar**.




For more information on sort and filter functionality, see [Navigating Build, starting on page 20](#).

## Adding or Altering User Accounts

Clicking the **Add**  button at the bottom of the screen adds a row to the **Manage Users** list. Clicking each column for the added user row activates a text box or button for **User Name**, **Set New Password**, and **Account Locked?** status. When the **Account Locked** check box is checked, the user account is locked, and the user cannot access Verity. This can happen if the number of failed login attempts exceeds the number allowed in the User Management rules.

On the left-hand side of each user name is the **Expand**  button. Clicking the **Expand** button for a given user displays the role assigned to that user for each application.

**Note:** User roles are assigned only on the workstation or network on which the user and roles were created and do not travel system to system.

Once clicked, the **Expand** button is replaced by the **Collapse** button . Clicking the **Collapse** button closes the user roles section.

At the top of the expanded **Manage Users** list is another sort and filter bar.



Users can sort by **Application** in ascending or descending order.

To make a change to a user role, users can click in the **Role** space beside the **Application** name, click the down arrow ▾, and scroll through the drop-down list to select a user role.

## Disabling versus Removing User Accounts

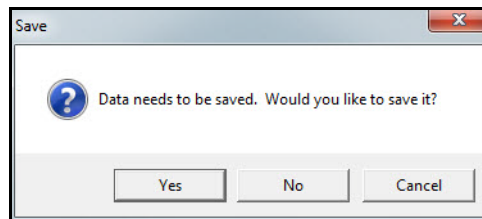
If an account may be used again, but only at specific times, the account can be locked, effectively deactivating or disabling the user account. The account remains on the workstation or network. Disabled user accounts can be enabled with a couple of clicks.

In some cases, user accounts may no longer be needed. These accounts can be deleted. When deleting an account, it is permanently removed from the workstation and no longer accessible until it is added again through User Management.

**Note:** If a user account is removed or locked on a system consisting of multiple workstations, it is removed or locked across all workstations on that network.

### Disabling a User Account

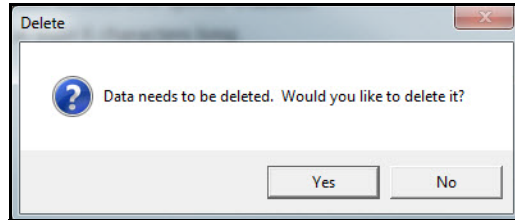
A user account can be disabled by clicking the check box to the right of the user name and password. Clicking the check box displays the **Save** window.



Clicking **Yes** disables the account and closes the **Save** window. Clicking **No** closes the **Save** window without disabling the user account.

## Deleting a User Account

Clicking to select an account in the **Manage Users** list and then clicking the **Delete** button at the bottom of the screen displays the **Delete** window.



Clicking **Yes** closes the **Delete** window and permanently deletes the user account. Clicking **No** closes the **Delete** window without deleting the user account.

## Configuring Rules

To the right of the **Manage users** list is the set of options for setting user and password complexity rules. Each user rule is enabled by clicking the empty check box ☐. When checked, the box is enabled. Users can click the checked box to disable the option.

To select or change a numeric value for any of the all-users rules, users can click in the text field and type a number or click the up  or down  arrows until the desired number appears in the text box.

## Next Topics

The next chapter discusses the roles specific to Central in [User Roles](#), starting on page 67.



CHAPTER 5

User Roles

This chapter describes the individual screens in the Verity Central workflow and includes the following sections:

Central Users ..... 66

How Screens Differ ..... 67

Viewer Screens..... 68

Central Resolution Board ..... 70

Central Operator ..... 73

# Central Users

## Central User Roles

Verity applications enable administrator level users to assign roles to users according to each user's activity type. Role assignment enables users to view and interact with only those functions pertinent to each user's role. Functions not relevant to a given user are not displayed.

Central includes the following user roles:

- **Desktop Admin:** Has administrator access to the Desktop tool in Verity and can change the date and time, alter the Daylight Savings option, export file hashes to validate the current Verity installation, or access the operating system with a code from Hart Customer Support
- **ElectionManager Admin:** Has administrator access to the Election Manager tool in Verity and can perform all functions available in the Election Manager Actions drop-down list
- **UserManager Admin:** Has administrator access to the User Manager tool in Verity and can add, alter, or delete user profiles
- **Central Resolution Board:** Can open elections and tasks, and can resolve ballots
- **Central Admin:** Has administrator access to Central and can perform all operations with unrestricted access
- **Central Operator:** Can perform all operations except configuring preferences and settings
- **Central Viewer:** Can select elections and tasks; can generate, view, print, and export reports

Any Verity Central user can be assigned multiple roles, but not more than one role per application.

# How Screens Differ

## Server and Client Configurations

Depending on whether a user is logged into a client or a server workstation would determine what the user can access, regardless of user role assignment. The Election Manager tile will not display on a networked client workstation. The Election Manager tile only displays on server or standalone workstations and only when the user logged into the workstation is assigned the corresponding user role.

## Role-Based Views

Central streamlines the tasks assigned to each user by including on each screen only those items available to a given user role. Central users with Resolution Board, Operator, and Viewer access work with a smaller set of screens and functions than Admin users. The functions are the same among user roles; only the selection is smaller.

Desktop, Election Manager, and User Manager are each accessed through one user role. Therefore, any user with access to one of these applications can use all of the functionality for that tool. The screens are identical for each user with access to the application. For more information about the screens for these roles and applications, see [Desktop, starting on page 29](#), [Election Management, starting on page 39](#), and [User Management, starting on page 57](#).

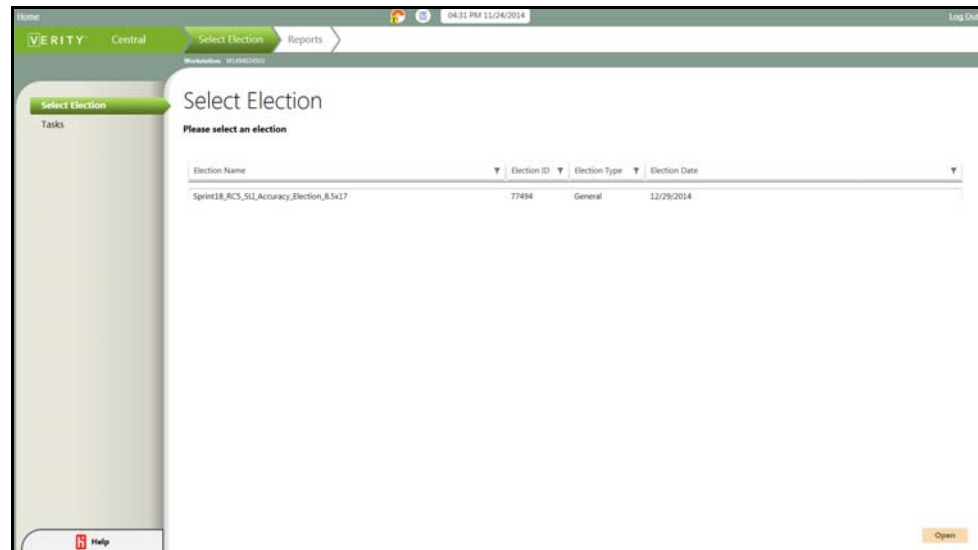
Central differs from the above mentioned tools by enabling users with one of four user roles to use the application. In order to ensure security and to simplify usability, users view only the tools applicable to their roles. Each role is provided access to a different set of screens. The functionality on all visible screens is the same among user roles; only the number of screens differs.

The remaining chapters in this document describe Central view and function from the perspective of the Central Admin.

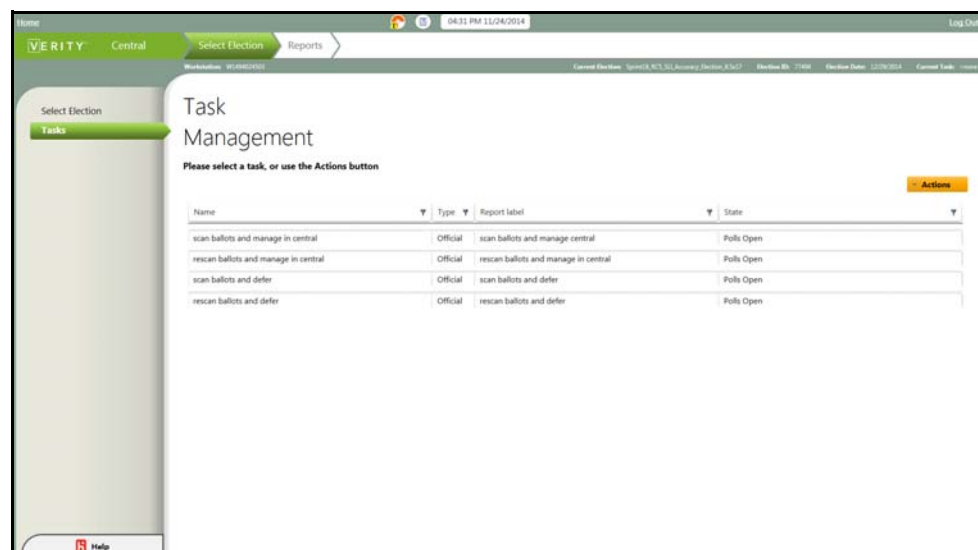
This chapter, then, depicts the Central screens from the perspective of the other users. All buttons and functions on the screens in this chapter are the same as those described in later chapters in this manual.

# Viewer Screens

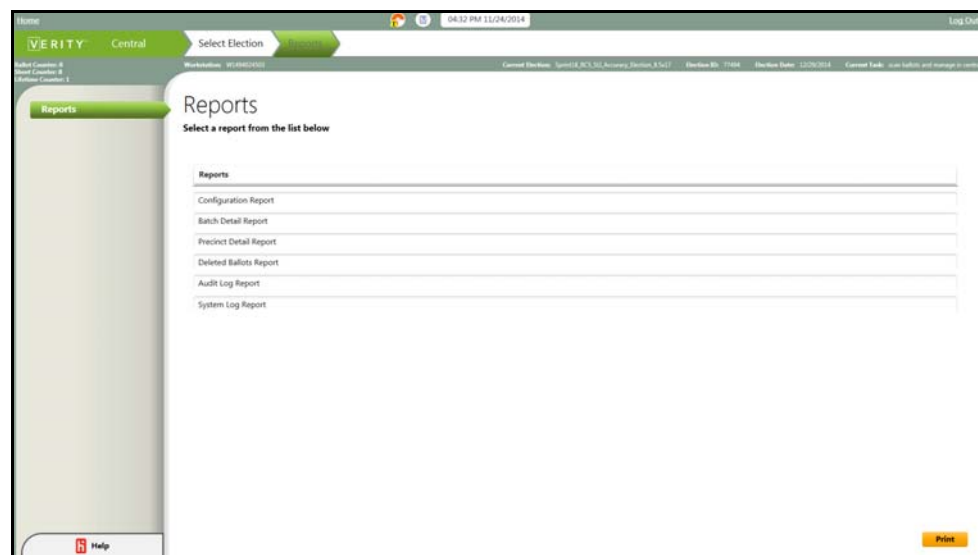
In Central, Viewers see only the **Select Election** and **Reports** chevrons.



The **Select Election** workflow screen contains only the **Select Election** and **Tasks** tabs.



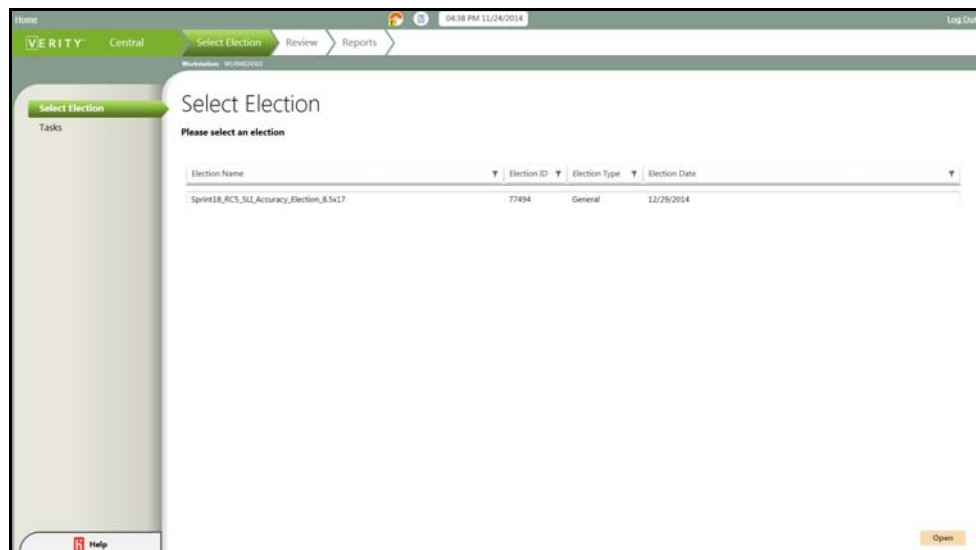
The **Reports** workflow contains the **Reports** tab.



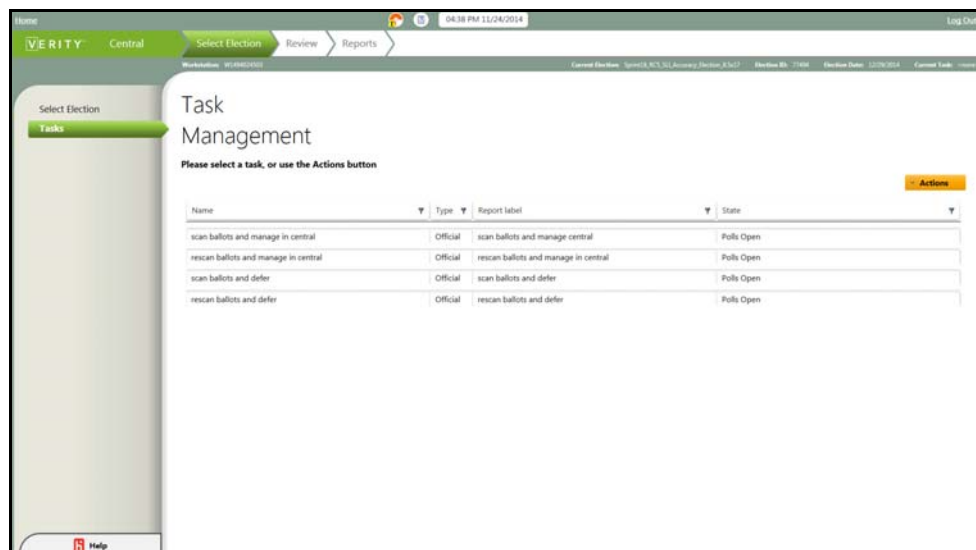
# Central Resolution Board

Central Resolution Board users perform adjudication tasks, so they are able to view the Select Election, Review, and Reports chevrons. These chevrons provide Resolution Board users with the following access:

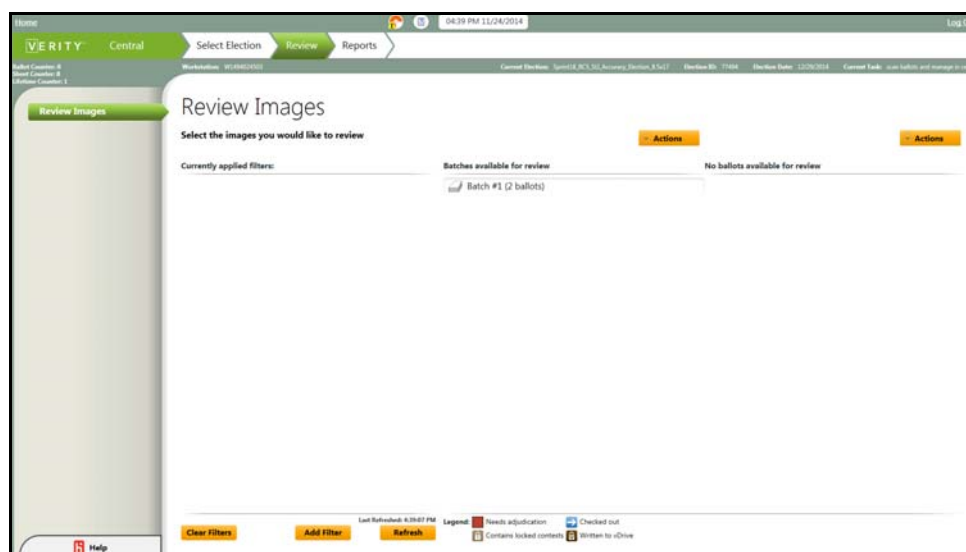
## Select Election



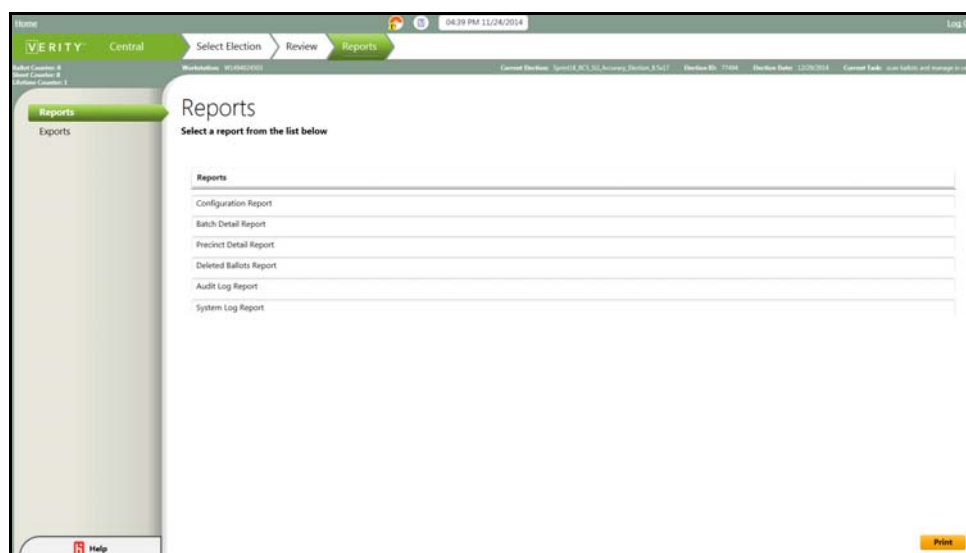
## Select Task



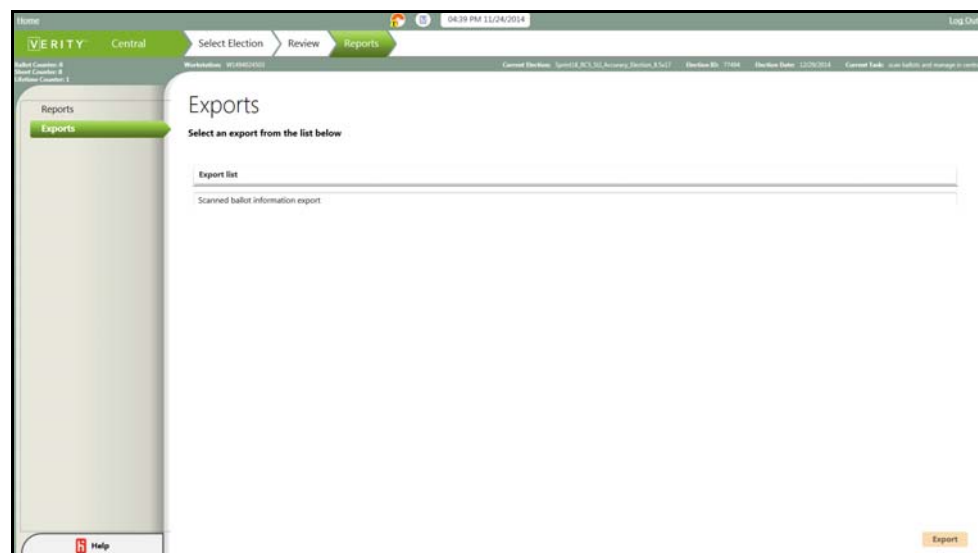
## Review ballot images and adjudicate



## Generate, view, print, and export reports



## Export scanned ballot information

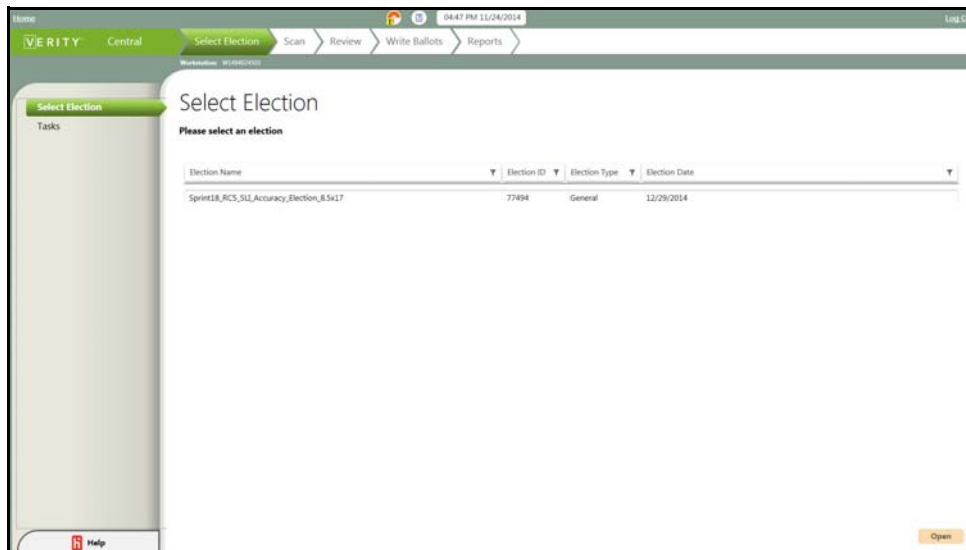




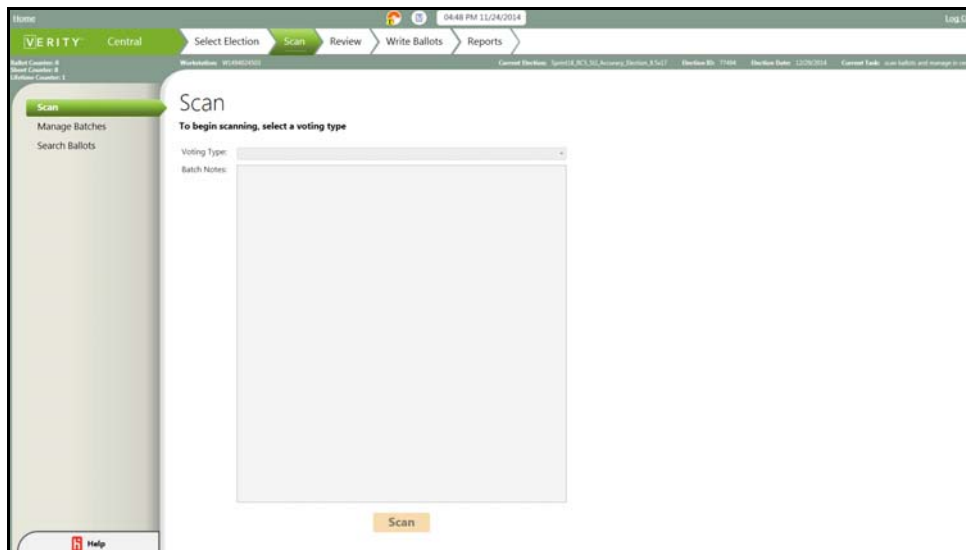
# Central Operator

The Central Operator can perform all operations except configuring preferences and settings. The Operator's screens, then, are very similar to those of the Central Admin. The following images depict the Central Operator workflows that differ from Central Admin workflows.

Select Elections: Preferences is omitted



Scan: Settings is omitted



## Next Topic

To get started working with Verity Voting elections, begin with [Getting Started with Central, starting on page 75](#). Getting Started provides log in details and describes how users begin working with elections.

CHAPTER 6

# Getting Started with Central

This chapter describes the individual screens in the Select Election workflow and includes the following sections:

- Logging In to Central ..... 76
- Verity Voting Launcher Screen ..... 80
- About Central Screens ..... 82
- Using the Select Election Workflow ..... 85
- Select Election Tab. .... 86
- Tasks Tab ..... 88
- Preferences Tab ..... 94



# Logging In to Central

Before users can view and work with elections, Verity Voting must first be installed and configured on the workstation, and the user must have adequate role permissions to manage elections. User role permission is discussed in the chapter on [User Management, starting on page 57](#).

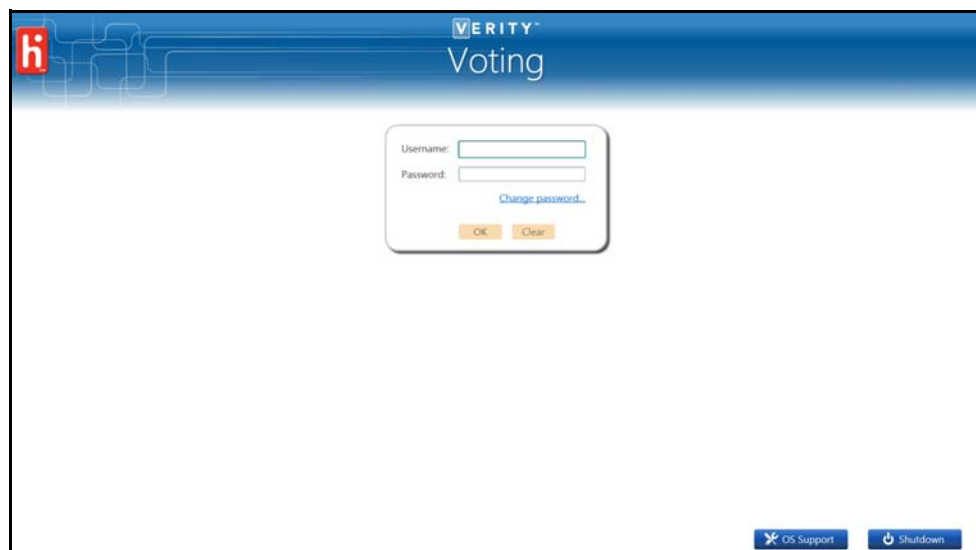
Users must log in to Verity in order to use Central (this login process is not associated with the Microsoft Windows user login). Verity notifies the user in the event that a user enters the incorrect login data.

## Proper Server-Client Start-Up and Shut-Down

When starting up and shutting down Verity networked workstations, it is important that users follow the correct procedures. The server should be powered up first. When the Log In window displays, then users should verify the Ethernet switch indicates that the server is connected to a port on the switch. After that, the client workstations should be powered up one at a time until the Log In window displays. Again, users should verify that the switch indicates that the Verity client is connected to a port on the Ethernet switch.

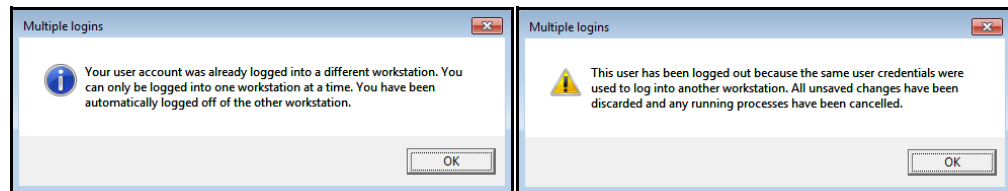
## Verity Login Window

When users start the Verity system, the **Verity** login window displays. The login window contains **User Name** and **Password** text boxes.



Both the **OK** and **Clear** buttons are dimmed, which indicates that they are not active and will not function. The user must populate both boxes with valid login data in order to use Central.

**Note:** Users are allowed to be logged into only one workstation. If a user logs into a second workstation, that user is immediately logged out of the first workstation.



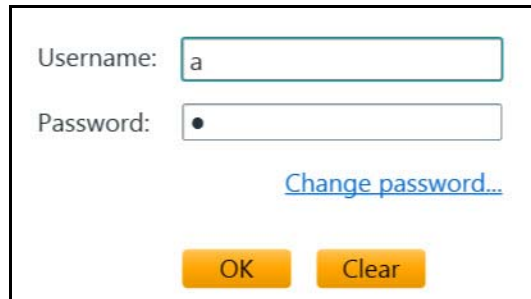
## User Name and Password Boxes

In order to use Central, the **User Name** and **Password** boxes must both be populated with a valid user ID and password.

When a character is typed into either box, the **Clear** button is activated.

**Note:** The initial password for the default user must be entered before the applications launch the first time. The password must then be reset.

When both boxes each contain a character, the **OK** button is activated. Clicking the **OK** button submits the user credentials.



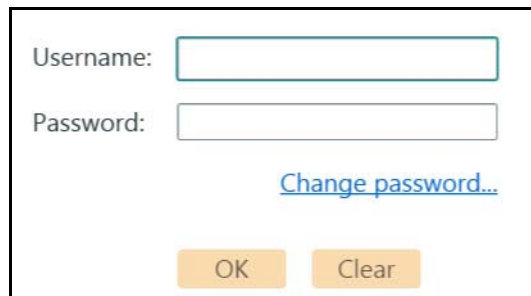
A login form with two input fields: 'Username:' containing the letter 'a' and 'Password:' containing a single black dot. Below the fields is a blue hyperlink labeled 'Change password...'. At the bottom are two orange buttons: 'OK' and 'Clear'.

## Forgotten Password

Administrators can assist users with forgotten passwords through the User Management application. See [User Management, starting on page 57](#).

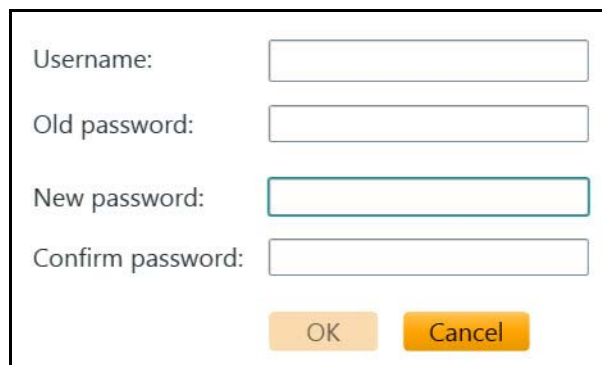
## Password Changes

Users can change the log in password by clicking the **Change Password** link.



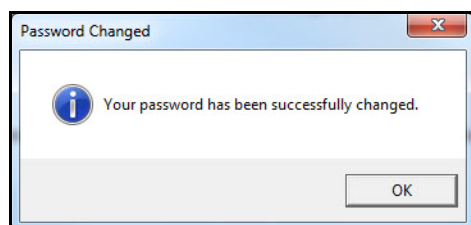
A form for changing a password. It has two input fields: 'Username:' and 'Password:'. Below the fields is a blue hyperlink labeled 'Change password...'. At the bottom are two orange buttons: 'OK' and 'Clear'.

By clicking the **Change Password** link, additional fields display for the user to enter and confirm a new password.



A form for changing a password. It has four input fields: 'Username:', 'Old password:', 'New password:', and 'Confirm password:'. Below the fields are two orange buttons: 'OK' and 'Cancel'.

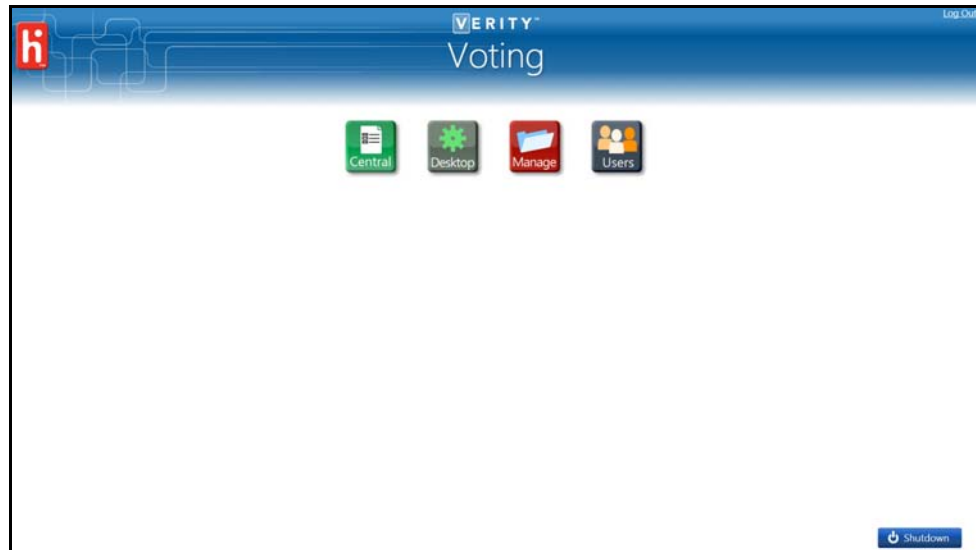
The user must enter the current user name and password, click the **Change Password** link, and then type the new password twice. The system verifies the password according to security data and complexity rules set in the User Management application. If the new password is accepted, the **Password Changed** popup window displays.



If an error occurs, an error message explaining the problem displays on the screen.

# Verity Voting Launcher Screen

After Verity verifies the user name and password, the **Verity Voting** launcher screen displays. The Verity Voting launcher is the Verity home screen.



**Note:** Those logging into client workstations or those without election manager authorization will not see the Manage tile.



From the **Verity Voting** launcher screen, users can set up the desktop, manage elections and users, or start the Central application. Users with administrator level access see all of the tiles. For more information on user access and the Desktop, Manage, and User tiles, see [Desktop, starting on page 29](#), [Election Management, starting on page 39](#), and [User Management, starting on page 57](#).



## Central Tile

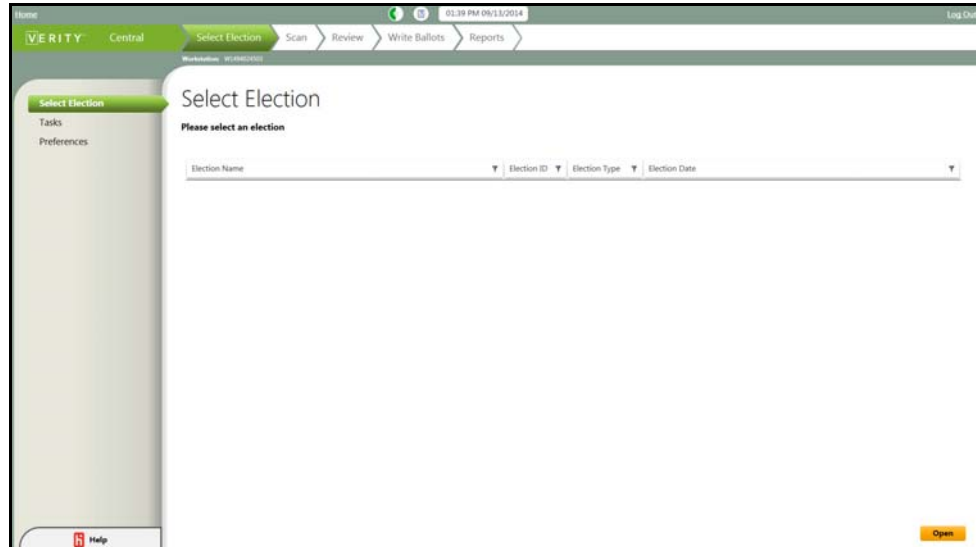
When the Verity launcher opens, the **Central** tile displays.



Clicking the **Central** tile opens the Central application.

# About Central Screens

When the Central tile is clicked, Verity displays the **Select Election** chevron and tab by default.

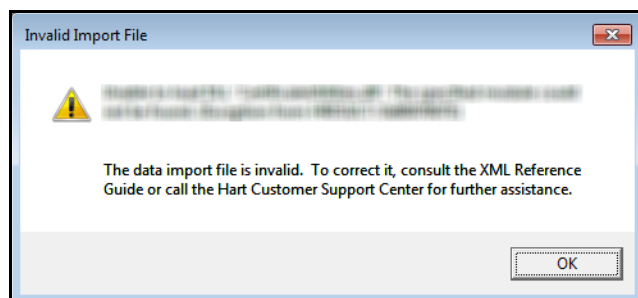


At first, the screen may be empty if no elections have been imported into Election Management. Once elections are imported, they are displayed in the **Select Election** list. For more information, see [Election Management, starting on page 39](#).

In the upper-left corner of the screen is the **Home** link **Home**. Clicking the **Home** link returns users to the **Verity Voting** launcher. Users can click the **Log Out** **Log Out** link in the upper-right corner of the screen to close the **Verity Central** application and display the **Log In** screen. To gain access to any of the options on the **Verity Central** launcher, users must log in to Central once again.

## Message Windows

This document is a companion to the corresponding Quick Reference Manual, which contains instructions for using this Verity application. In the event that users receive error, warning, or failure messages, they can follow the instructions in the message window and reference the relevant section in this corresponding Technical Reference Manual. Verity is designed to provide users with instructions for next steps within the error, warning, or failure message window.



## Central Chevrons Overview

Chevrons are displayed across the top of all of the application screens. Central has five chevrons: **Select Election**, **Scan**, **Review**, **Write Ballots**, and **Reports**. When Central opens, **Select Election** is displayed by default. The dark-colored chevron is the active workflow. The other chevrons remain dimmed.

The left side of the **Select Election** window contains the options available for the workflow activity selected.

The **Select Election**, **Scan**, **Review**, **Write Ballots**, and **Reports** chevrons provide users with the following listed activities.

Select Election	Scan	Review	Write Ballots	Reports
<ul style="list-style-type: none"> <li>Select Election</li> <li>Tasks</li> <li>Preferences</li> </ul>	<ul style="list-style-type: none"> <li>Scan</li> <li>Manage Batches</li> <li>Search Ballots</li> <li>Settings</li> </ul>	<ul style="list-style-type: none"> <li>Review Images</li> <li>Write-in Candidates</li> </ul>	<ul style="list-style-type: none"> <li>Write Ballots</li> <li>Recovery vDrive</li> </ul>	<ul style="list-style-type: none"> <li>Reports</li> <li>Exports</li> </ul>

## Select Election Chevron

**Select Election** is the default workflow when users log in to Central.

The **Select Election** workflow has three options: **Select Election**, **Tasks**, and **Preferences**. The **Select Election** tab is used to open elections so that users can work with them. The tasks tab is used to open an election so users can work with it. **Tasks** are sub-sets of the **Select Election** workflow. The **Preferences** tab is used to set the default voting type.

## Scan Chevron

Double-clicking a task in the **Task Management** list displays the **Scan** workflow by default. The **Scan** workflow has four options: **Scan**, **Manage Batches**, **Search Ballots**, and **Settings**. This workflow is used for scanning and the management of scanned batches.

## Review Chevron

The **Review** chevron has two options: **Review Images** and **Write-in Candidates**. The Review workflow is used to review ballots and resolve voter intent issues.

## Write Ballots Chevron

The **Write Ballots** chevron has two options: **Write Ballots** and **Recovery vDrive**. The **Write Ballots** tab is used to write ballots to a vDrive. **Recovery vDrive** is used to create a recovery vDrive, which is needed if a vDrive is lost or damaged.

## Reports Chevron

The **Reports** chevron has two options: **Reports** and **Exports**. The **Reports** tab is used to create election, audit log, and configuration reports. The **Exports** tab is used to export ballot information.

# Using the Select Election Workflow

The **Select Election** screen is the Central home screen. This screen displays upon opening Central.



The **Select Elections** workflow displays three tabs:

- **Select Election** : Lists all of the elections in Central
- **Tasks** : Lists all of the tasks in Central; users add tasks through the Tasks tab
- **Preferences** : Sets the default voting type

# Select Election Tab

The **Select Election** tab contains the list of elections that have been imported into Central through Election Management. For more information about Election Management, see [Election Management, starting on page 39](#).

## Sort and Filter Bar

The Sort and Filter bar is located at the top of the **Select Election** list.

Election Name	▼	Election ID	▼	Election Type	▼	Election Date	▼
---------------	---	-------------	---	---------------	---	---------------	---

Sort and filter functionality is explained in the [Introduction](#) in the section entitled [Navigating Central, starting on page 21](#).

## Filter Options

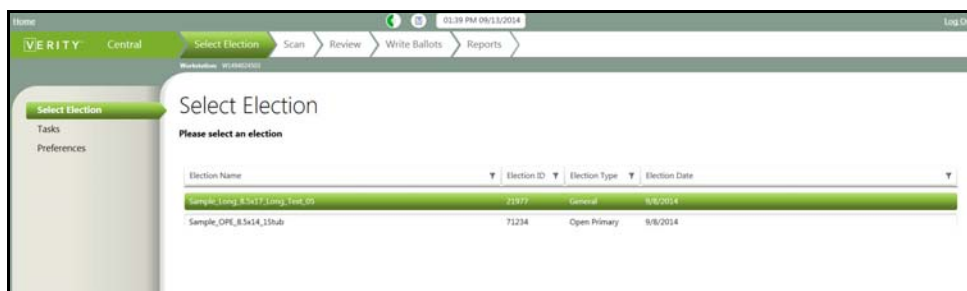
Filter options vary by election. Clicking the **Filter** icon displays the drop-down list of filter options.


## Opening an Election

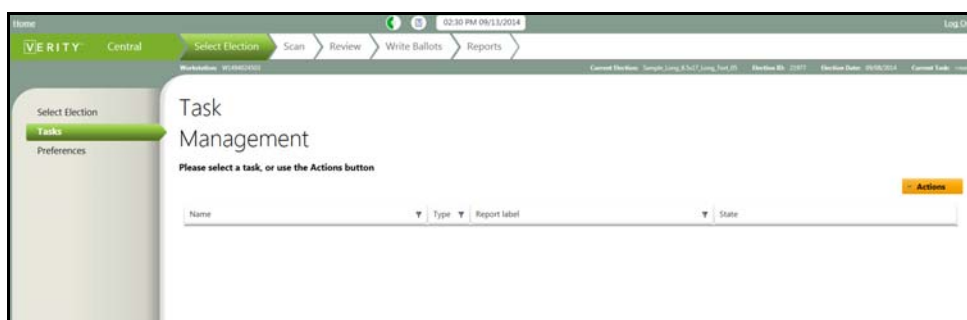
The **Select Election** list is empty until elections are imported through Election Management. For information on loading elections, see [Election Management, starting on page 39](#).



Clicking the **Select Election** chevron and then the **Select Election** tab displays the **Select Election** list.

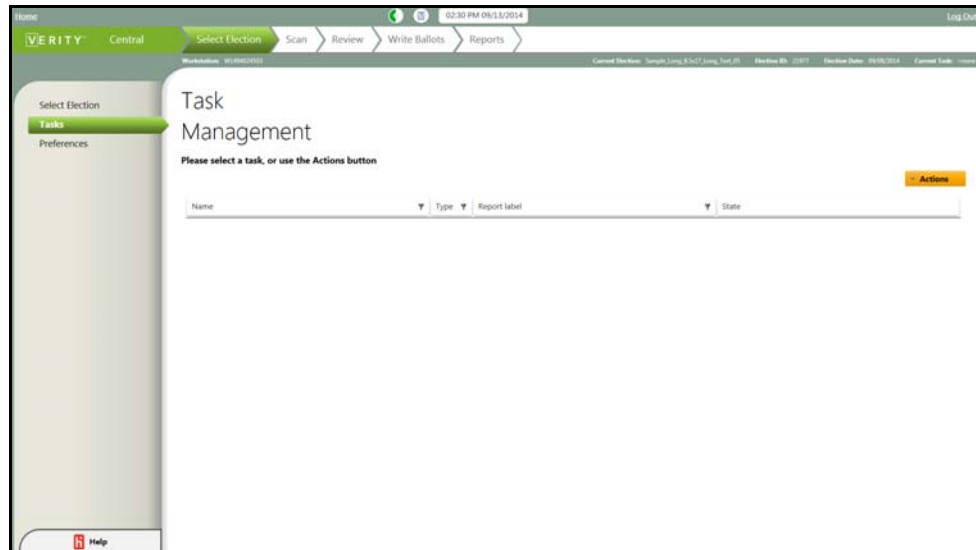


Users can open an election by clicking to select an election and then clicking the **Open**  button in the lower-right corner of the screen. Alternatively, users can double-click the election. Both methods open the **Task Management** screen.



# Tasks Tab

Double-clicking an election in the **Select Election** list displays the **Task Management** screen and the tasks associated with the selected election.



Using **Task Management**, users add or select tasks to perform in the ballot scanning and resolution process.

## Sort and Filter Bar

The Sort and Filter bar is located at the top of the **Task Management** list.



Sort and filter functionality is explained in the [Introduction](#) in the section entitled [Navigating Central, starting on page 21](#).

## Filter Options

Filter options vary by election. Clicking the **Filter** icon displays the drop-down list of filter options.




## Working with Tasks

Tasks are the access points into Central functionality. Tasks are subsets of an election and are created for scanning ballots and running tests.

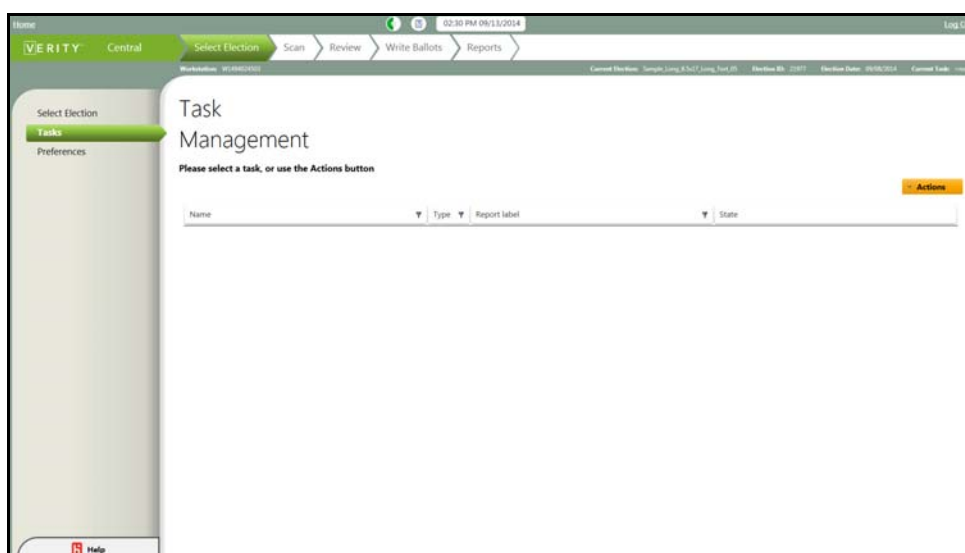
A minimum of one task is required. Without tasks, users cannot progress beyond the Select Election chevron.

## Opening a Task

Double-clicking a task, or clicking to select a task and then clicking the **Open**  button, opens the task in the **Scan** workflow. See [Scan Chevron, starting on page 95](#) for more information.

## Creating New Tasks

When the **Task Management** screen is first opened, the task list may be empty.

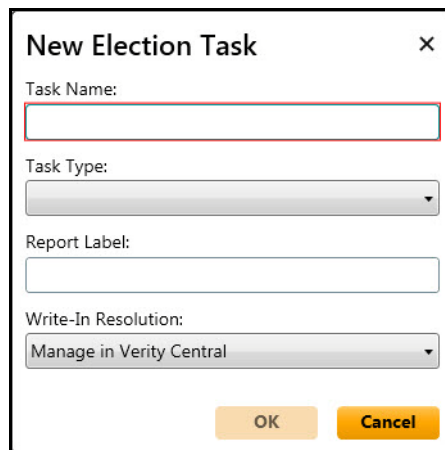


Users can create up to 15 tasks per election. At least one task must be created to scan and manage ballots.

Users can create tasks by clicking the **Actions** button and then selecting **New**.



The **New Election Task** dialog window opens.

A screenshot of a dialog window titled "New Election Task" with a close button (X) in the top right corner. The dialog contains four input fields: "Task Name:" (a text box with a red border), "Task Type:" (a dropdown menu), "Report Label:" (a text box), and "Write-In Resolution:" (a dropdown menu showing "Manage in Verity Central"). At the bottom right are two buttons: "OK" and "Cancel".

Users enter the required **Task Name** and **Report Label** (optional), select the required **Write-In Resolution** option, and select the required **Task Type**.

Official
Test

When a **Task Type** is selected, the **OK** button is activated.

Users can select another option from the **Write-In Resolution** drop-down list. This option defaults to **Manage in Verity Central**.

Manage in Verity Central
Defer to Verity Count

Clicking **OK** saves the new task to the **Task Management** list and closes the **New Election Task** window. Clicking **Cancel** closes the window without saving the new task.

Any tasks added in the **Task Management** screen apply to the open election. Tasks cannot be copied between elections.

With a task selected, clicking the **Actions** drop-down list displays an all-active list.

Open
New
Rename
Change label
Close Polls
Delete

## Renaming a Task

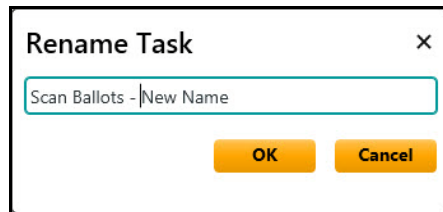
To edit a task, users click to select a task on the **Task Management** screen.

Clicking the Actions button displays the Actions drop-down menu.

Users select **Rename**.



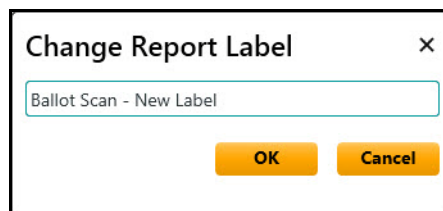
The **Rename Task** dialog box displays.



Users can rename a task by typing over the old name. Clicking **OK** saves the new name and closes the window. Clicking **Cancel** closes the window without saving changes.

## Changing the Report Label

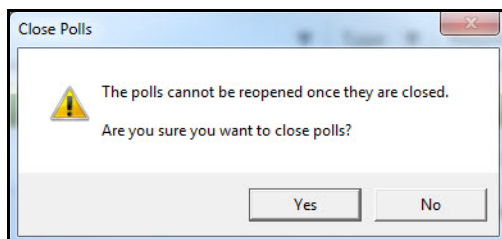
Selecting **Change Label** from the **Actions** drop-down list displays the **Change Report Label** dialog window.



Users can change the report label by typing over the old label. Clicking **OK** saves the new label and closes the window. Clicking **Cancel** closes the window without saving changes.

## Close Polls

Selecting the **Close Polls** option from the **Actions** drop-down list opens the **Close Polls** dialog window.



Clicking **Yes** closes the polls and closes the dialog window. Clicking **No** closes the window without closing the polls.



**CAUTION:** Once polls are closed, they cannot be reopened. Closing polls is permanent for the current task.

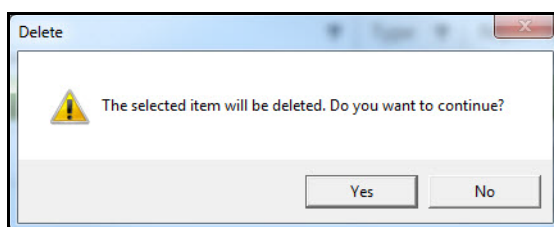
## Delete a Task



**CAUTION:** Deleting a task removes all work associated with that task.

Before deleting a task and all associated contest results, the user may want to perform backup procedures to save the task and all associated work.

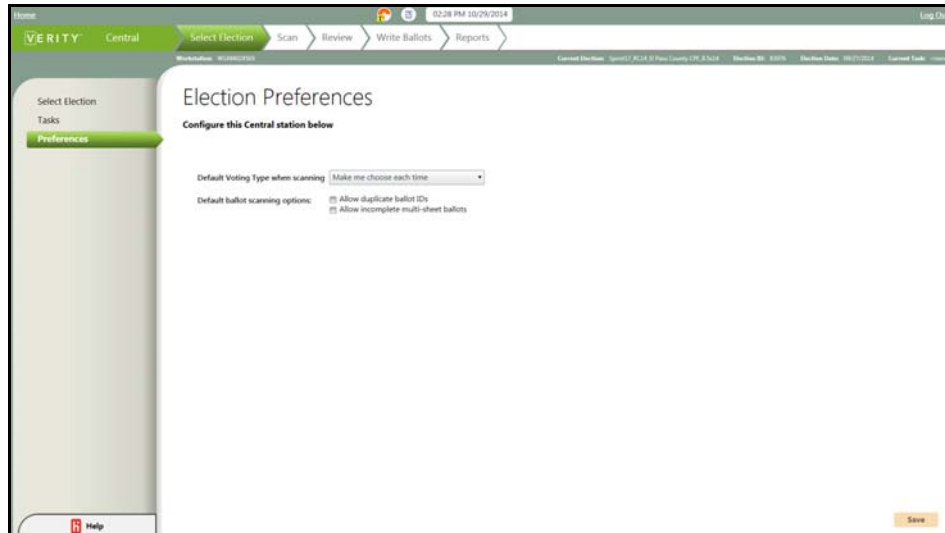
To delete a task, users click to select a task on the **Task Management** screen, click the **Actions** drop-down list, and select **Delete**. The **Delete** dialog window displays.



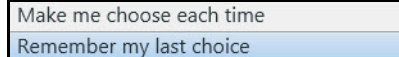
Clicking **Yes** deletes the task and closes the dialog window. Clicking **No** closes the window without deleting the task.

# Preferences Tab

Clicking the **Preferences** tab displays the **Election Preferences** screen.



The **Election Preferences** screen is where users set the **Default Voting Type when scanning** value. Users have two options: **Make me choose each time**, and **Remember my last choice**.



**Make me choose each batch** is the default voting type.

Users can also select default values for **Allow duplicate ballot IDs** and **Allow incomplete multi-sheet ballots** from the **Default ballot scanning options** list. These settings can be set for each batch on the **Settings** screen within the **Scan** workflow (see also [Settings Tab, starting on page 111](#)). Users can configure the following settings:

- **Allow duplicate ballot IDs:** This setting allows ballots with unique ballot IDs to be scanned more than once within a task.
- **Allow incomplete multi-sheet ballots:** When scanning ballots, incomplete ballots are scanned without being rejected. Incomplete ballots are defined as not including all pages.

## Next Topic

The next chapter discusses the Scan chevron and the tasks associated with scanning ballots in Central. Scanning, managing, and searching ballots are discussed in [Scan Chevron, starting on page 95](#).

CHAPTER 7

# Scan Chevron

This chapter describes the individual screens in the Scan workflow and includes the following sections:

- About Scanning Ballots ..... 96
- Using the Scan Workflow..... 97
- Scan Tab ..... 98
- Manage Batches Tab..... 101
- Search Ballots Tab ..... 106
- Settings Tab ..... 111



# About Scanning Ballots

This chapter introduces ballot scanning. In the scanning process, ballots are fed into a scanner that reads both the front and back pages of each ballot sheet. The ballot sheets can be fed into the scanner in either a header- or a footer-first orientation, and the sheets can be fed either face up or face down.

As ballots are scanned, the ballot images are analyzed and either accepted or rejected. Any accepted ballots needing additional review are flagged. The system alerts the user to review flagged ballots. Ballots are flagged for voter intent issues, which can include undervotes, overvotes, or any invalid mark. Ballots can be adjudicated later through the **Review** chevron.

Voter intent issues must be resolved in Central. Write-in resolution may be deferred to Verity Count if specified in the Task.

## Scan Preparation

Ballots can be scanned with the following paper sizes:

- 8.5" x 11"
- 8.5" x 14"
- 8.5" x 17"
- 11" x 17"

Ballots are scanned in batches, and ballot sheets can be fed into the scanner either header or footer first. The sheets can be fed either face up or face down.

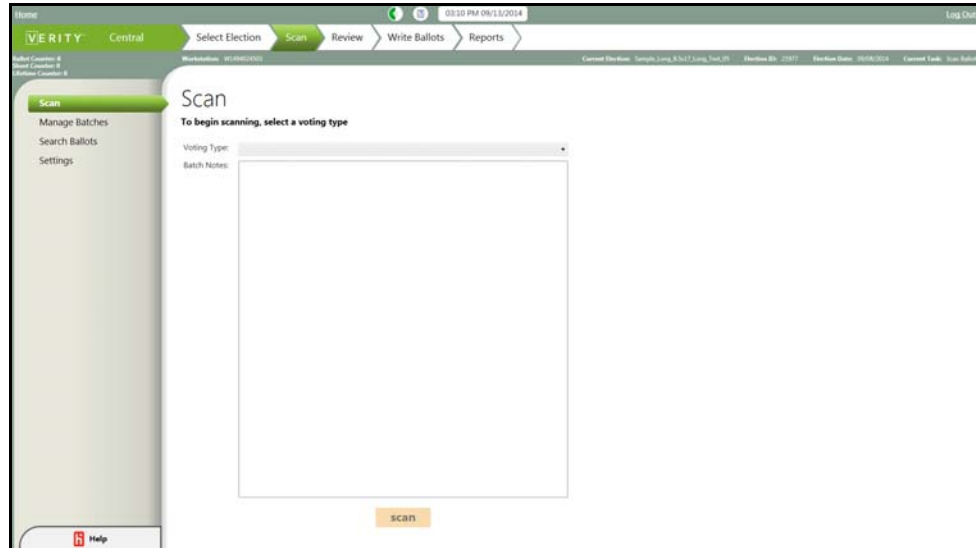
During scanning, the application displays scanned ballot images in a preview viewer.

The system checks for scanning issues such as multi-feeds and paper jams. If issues occur, the system informs the user with an alert.



# Using the Scan Workflow

Double-clicking a task in the **Tasks** screen opens the **Scan** workflow and the **Scan** tab. The **Scan** screen displays by default.



The **Scan** workflow includes four tabs:

- **Scan**: Scan ballots and save batches
- **Manage Batches**: Add or edit notes, change type, create batch report, or delete batch
- **Search Ballots**: Search ballots for specific data; search by unique ID, batch, or scan order
- **Settings**: Configure settings and attach scanner

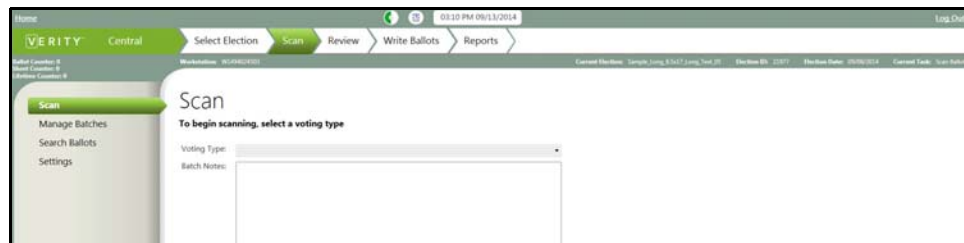
These tabs are discussed individually in the following sections. Note that, unless otherwise specified, the default value for check boxes and text boxes is blank.

# Scan Tab

The **Scan** tab enables users to scan ballots.



The **Scan** workflow opens to the **Scan** tab by default.

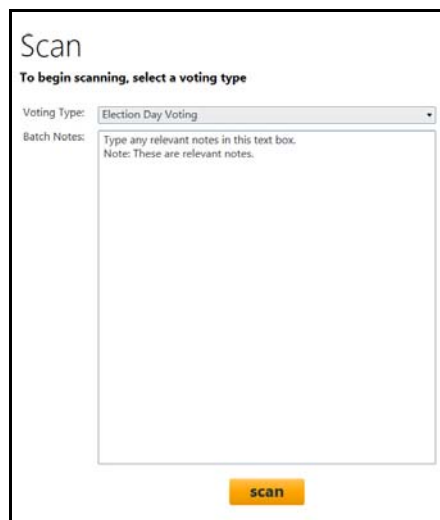


Paper ballots that have not already been recorded by Verity Scan at the polling place are scanned in Central. Central analyzes the scanned ballots to ensure they are valid. Any potential voter-intent issues are flagged for follow up.

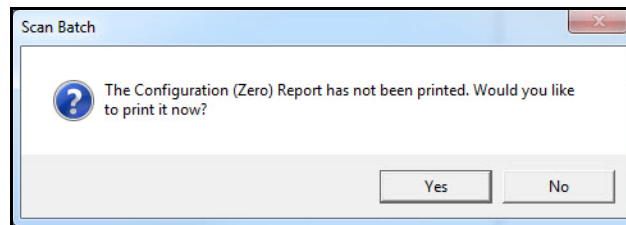
Users ensure the scanner is on and properly connected and configured, and then they place the ballots in the scanner tray. On the **Scan** screen, users can click the **Voting Type** drop-down list to select a voting type.



Any relevant notes should be typed in the **Batch Notes** text box. Users can type up to 500 alphanumeric characters.

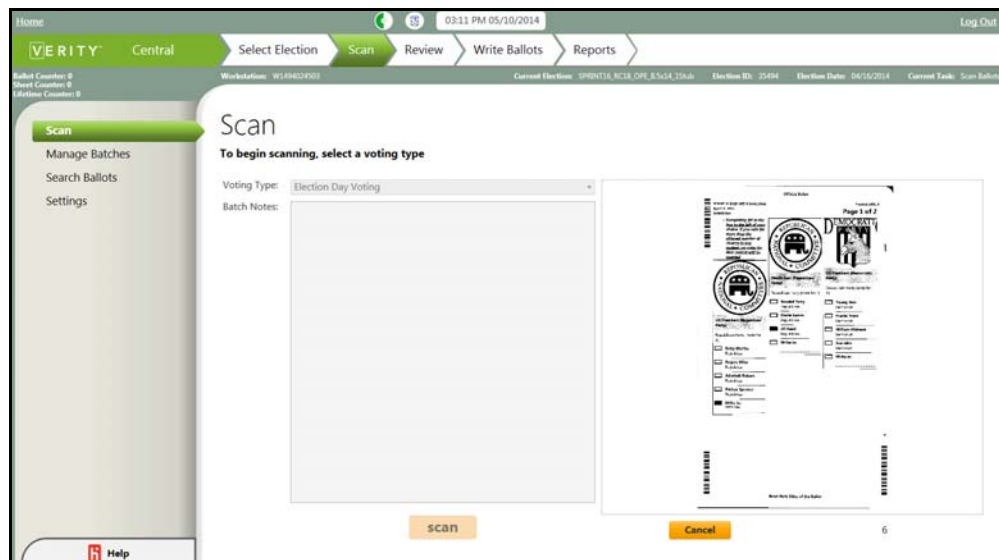


Clicking the **Scan** button begins the scan. If a Configuration (Zero) Report has not been printed, the **Scan Batch** window displays.

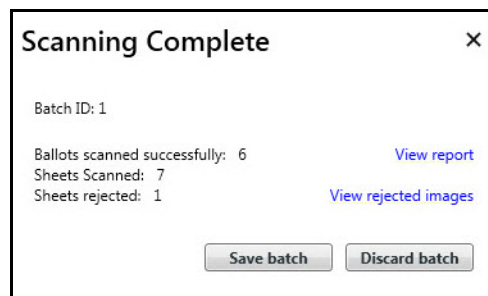


Clicking **Yes** closes the **Scan Batch** window and prints the report to the screen. Users can then print or export the report. Clicking **No** closes the **Scan Batch** window without printing the report. In either case, users must start the scan again.

As ballots are scanned, ballot images are displayed on the **Scan** screen.



When scanning is complete, the **Scanning Complete** window displays the scan results.



**Note:** The Scanned Batch report can be accessed by clicking **View Report**.

Users can view the scan report, view the rejected images, and either save or discard the batch by clicking the corresponding button. Clicking **Save Batch** closes the **Scanning Complete** window and saves the batch. Clicking **Discard Batch** closes the window without saving the batch.

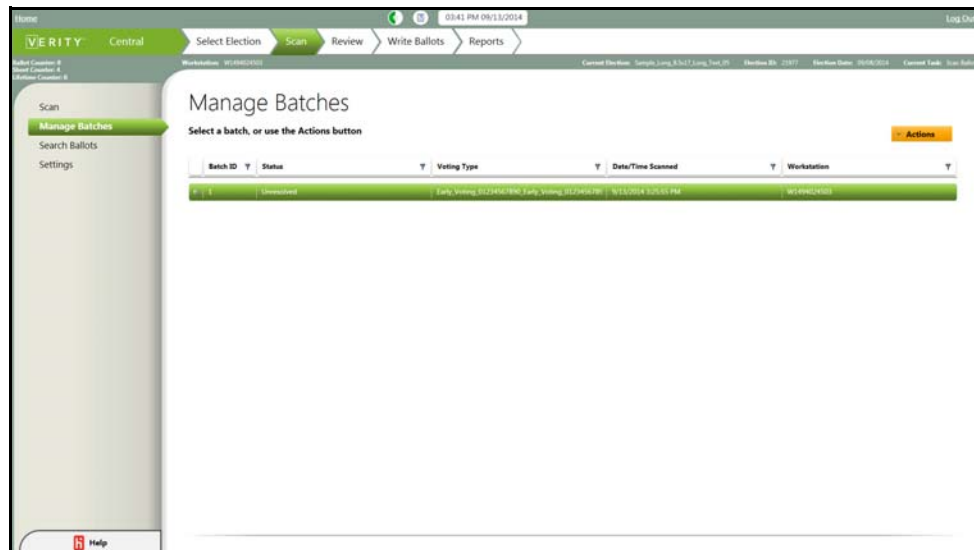
Once ballots are scanned and the batch is saved, the batch of ballots can be reviewed for any issues. Voter intent issues must be resolved in Central.

# Manage Batches Tab

The **Manage Batches** tab enables users to use a sort and filter bar to view the **Manage Batches** list, view **Batch Notes**, and perform actions from the **Actions** drop-down list.

## Manage Batches

Clicking the **Manage Batches** tab displays the manage batches screen.



Scan Chevron

The **Batches** list includes the following information for each batch:

- **Batch ID:** The ID associated with the batch when scanned
- **Status:** The status of the batch:
  - *Unresolved:* Ballots need review
  - *Resolved:* All ballots are reviewed, if needed, and either accepted or rejected
  - *Written:* Written to vDrives for tabulation
- **Voting Type:** The voting type selected when scanning the batch
- **Date/Time Scanned:** The date and time when the batch was scanned
- **Workstation:** The Central workstation where the batch was scanned

## Sort and Filter Bar

The Sort and Filter bar is near the top of the **Manage Batches** window.


Batch ID	Status	Voting Type	Date/Time Scanned	Workstation
----------	--------	-------------	-------------------	-------------

Sort and filter functionality is explained in the [Introduction](#) in the section entitled [Navigating Central, starting on page 21](#).

## Filter Options

Filter options vary by election. Clicking the **Filter** icon displays the drop-down list of filter options. For information on filter options, see [Navigating Central, starting on page 21](#).

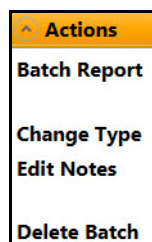
## Viewing Batch Notes

Any text that was typed in the **Batch Notes** text box on the **Scan** screen is viewable on the **Manage Batches** screen. Clicking the expand button  displays the **Batch Notes** text window.



## Actions

Clicking the **Actions** button displays the **Actions** drop-down list.



Users can run a batch report, change the batch type, edit the batch notes, or delete a batch using the **Actions** list.

## Batch Report

Selecting the **Batch Report** option from the **Actions** drop-down list displays the **Batch Report**.

**Scanned Batch Report**  
rescan ballots and manage in central

Run Time: 5:49 PM  
Run Date: 11/20/2014

**Jurisdiction**  
Sprint18\_RC5\_SLI\_Accuracy\_Election\_8.5x17

12/29/2014  
Page 1 of 1

**Batch ID:** 1  
**Workstation:** W1494024503  
**Voting Type:** Absentee Voting

**Batch Status:** UnResolved

**Scanned start time:** 11/20/2014 17:11:48

**Scanned end time:** 11/20/2014 17:12:00


Scan Order	Precinct Name	Page	Unique ID	Variation	Language	Party	Status	Rejection Reason
1	1	8	171	0	English		Scanned	
1	1	7	171	0	English		Scanned	
2	1	6	171	0	English		Scanned	
2	1	5	171	0	English		Scanned	
3	1	4	171	0	English		Scanned	
3	1	3	171	0	English		Scanned	
4	1	2	171	0	English		Scanned	
4	1	1	171	0	English		Scanned	
<b>Total images scanned:</b>		8					<b>Total ballots scanned:</b>	1
<b>Total images accepted:</b>		8					<b>Total ballots accepted:</b>	1
<b>Total images rejected:</b>		0					<b>Total ballots rejected:</b>	0

Scan Chevron

The **Batch Report** contains the following data about each ballot in the scanned batch:

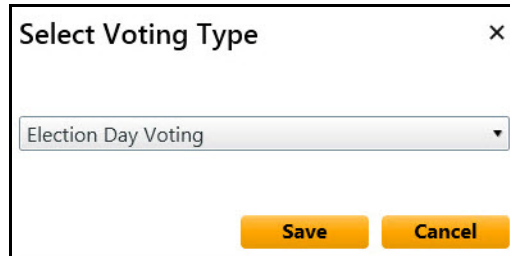
- Ballot page scan sequence number among all scanned ballot pages
- Precinct or precinct split name in which ballot was cast
- Page number of ballot
- Unique ID of ballot (optional, depending upon election settings)
- Variation number
- Language in which voter cast ballot
- Party affiliation, if closed primary election
- Scan status
- Rejection Reason, if applicable

Totals for ballots and images scanned, accepted, and rejected are listed at the end of the report.

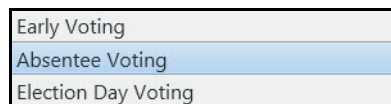
Users can export or print the report using the tools in the upper-left corner of the screen. Clicking the **Close**  button closes the report window.

## Change Type

Selecting the **Change Type** option from the **Actions** drop-down list displays the **Select Voting Type** dialog window.



Clicking the down-arrow beside the current voting type displays the **Voting Type** drop-down list.



Users can click to select another voting type or leave the option as it is. Clicking **Save** saves the currently selected voting type and closes the window. Clicking **Cancel** closes the window without saving changes.


## Edit Notes

Selecting **Edit Notes** from the **Actions drop-down** list displays the **Edit Notes** dialog window.



Users can type up to 500 alphanumeric characters in the text box. Clicking **Save** saves the changes and closes the window. Clicking **Cancel** closes the window without saving changes.

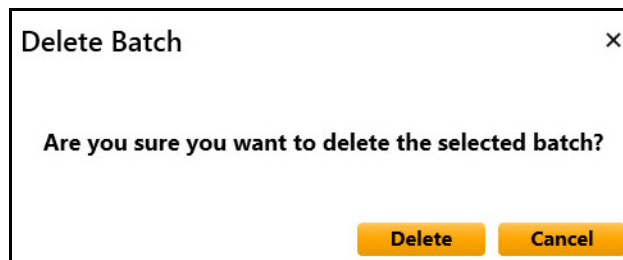


From the **Manage Batches** pane, clicking the **Expand** button  displays the newly added notes.



## Delete Batch

Selecting the **Delete Batch** option from the **Actions** drop-down list displays the **Delete Batch** dialog window.



Clicking **Delete** deletes the batch and closes the window. Clicking **Cancel** closes the window without deleting the batch.

# Search Ballots Tab

The **Search Ballots** tab allows users to search for specific ballots.

**Search Ballots**

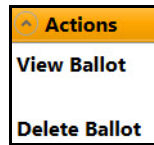
Clicking the **Search Ballots** tab displays the **Search Ballots** screen.

Using the **Search Ballots** screen, users can search for a specific ballot or set of ballots. Users can search by unique ID, batch number, or scan order by entering a value in one or more text boxes. Leaving the text boxes empty and clicking the **Search** button displays all ballots. Adding a value to at least one of the text boxes and clicking **Search** displays the list of search results.

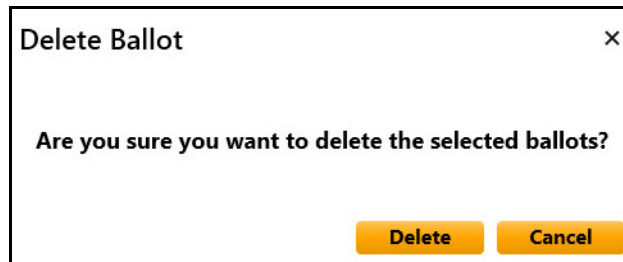
Unique ID	Ballot	Status	Batch	Voting Type	Party	Workstation
1		Not Resolved	1	Early Voting		W1494024503

Search results include an **Actions** button and drop-down list. If the search produces no ballots, a message displays stating that **No ballots match the search criteria**.

Clicking to select an item in the list of search results activates the options in the **Actions** drop-down list.



With an item selected, users can select either to **View Ballot** or **Delete Ballot**. Clicking the ballot selects it. Selecting **Actions** and then **Delete** displays the **Delete Ballot** dialog window.



Clicking **Delete** deletes the ballot and closes the window. Clicking **Cancel** closes the window without deleting the ballot.

Clicking **View Ballot** displays the **Ballot Viewer** window in which users can view the ballot.

**Ballot viewer** [Close]

[Zoom Slider] [Actions]

**ONKSI Ballot**

Spring 2024 Primary Election  
September 23, 2024  
Harris County, Texas

Make your choices by completely filling in the bubble to the left of the position that you would like to choose. Use a blue or black ball point pen. Do not use pencils.

**REP United States Senator**

☐ John Cornyn  
☒ Steve Stockman  
☐ Reid Menendez  
☐ Ken Cope  
☐ Dwayne Stovall  
☐ Chris Mapp  
☐ Curt Clawson  
☐ Linda Vega

**REP District 16 United States Representative**

☒ Corey Root

**REP District 29 United States Representative**

☐ Francisco "Quico" Carrasco  
☐ Will Hurd  
☒ Robert Loney

**REP Governor**

☐ Secula Kilgore  
☐ Lisa Pitts  
☒ William Markins  
☐ Greg Abbott

**REP Lieutenant Governor**

☐ Todd Stapples  
☐ Dan Patrick  
☐ Jerry Patterson  
☐ David Dewhurst

**REP Attorney General**

☐ Dan Brauch  
☐ Kerry Smithamman  
☒ Ken Paxton

**REP Comptroller of Public Accounts**

☐ Raul Torres  
☐ Henry Hilderborn  
☒ Glenn Hager  
☐ Debra Medina

**REP Commissioner of the General Land Office**

☐ George P. Bush  
☐ David Watts

**REP Commissioner of Agriculture**

☐ J. Allen Carnes  
☐ Sid Miller  
☒ Joe Cribben  
☐ Eric Opella  
☐ Tommy Merritt

**REP Railroad Commissioner**

☐ Malachi Reynolds  
☐ Becky Bargar  
☐ Wayne Christensen  
☐ Ryan Sitton

**REP Chief Justice, Supreme Court**

☐ Nathan Hecht  
☐ Robert Talton

Read Both Sides of the Ballot

Batch 1 Unique ID  
Scan order 1 Page 1

Previous 1 of 4 Next

Within the **Ballot Viewer** are three functions to note:

- Zoom
- Actions
- Previous/Next

The **Zoom** function is displayed as a sliding bar with zoom out to the left toward the minus sign (-) and zoom in to the right toward the plus sign (+).



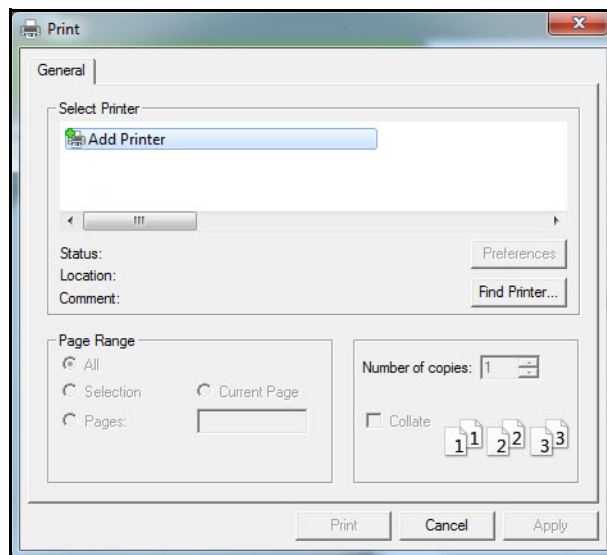
Users can click and drag the slider to the right to increase image size or left to decrease image size.

At the bottom of the window are the **Previous** and **Next** buttons. These buttons enable users to view other pages of the ballot. Buttons are active only when there is another page to view in the direction to which the button refers. For example, in the previous image, the **Next** button is active because the ballot includes a second page. The **Previous** button is not active because the ballot does not include a previous page, or page 0.

Clicking the **Actions** button on the **Ballot Viewer** screen enables users to **Print** or **Export** the image.

Exporting ballots allows the user to keep a digital image file of the ballot. The exported ballot images exclude bar codes to ensure the image cannot be rescanned by Central.

Clicking **Print** on the **Actions** drop-down list displays the **Print** window.



Users select their printer and then click **Print**.

Clicking **Export** displays the **File Browser Dialog** window.



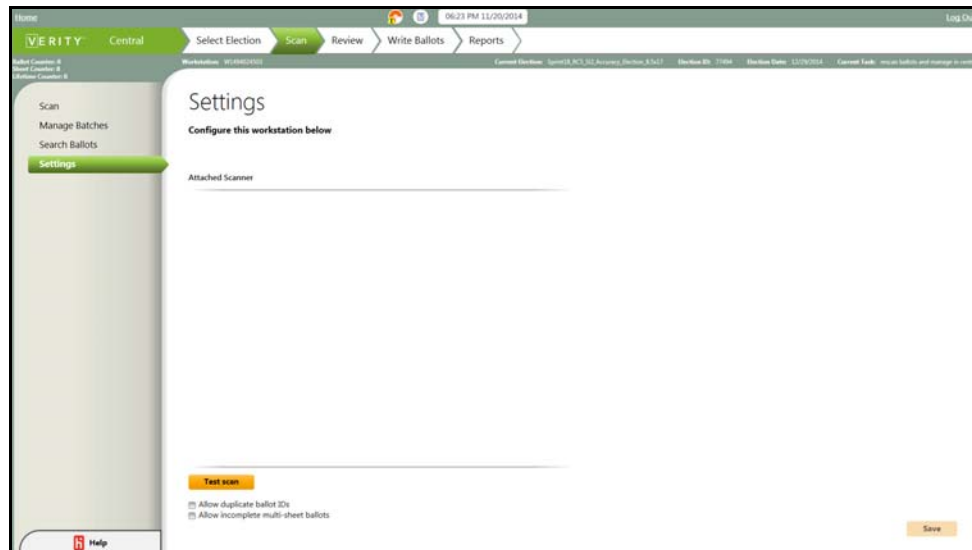
Users navigate to the external electronic media location to which they want to export the file. Clicking **OK** exports the image and closes the window. Clicking **Cancel** closes the window without exporting the image.

# Settings Tab

The **Settings** tab allows users to set configuration options before scanning.

**Settings**

Clicking the **Scan** chevron and then the **Settings** tab displays the **Settings** screen.




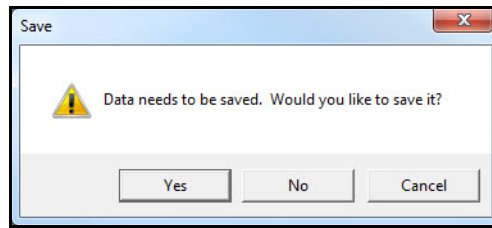
Scan Chevron

Prior to scanning ballots, users should configure scanner settings for the Verity Central workstation (see also [Preferences Tab, starting on page 94](#)). Central detects and displays the name of the scanner connected to the workstation. Users can configure the following settings:

- **Allow duplicate ballot IDs:** Ballots with unique ballot IDs may be scanned more than once in a task.
- **Allow incomplete multi-sheet ballots:** When scanning ballots, incomplete ballots are scanned without being rejected. Incomplete ballots are defined as not including all pages.

Clicking the **Test Scan** button runs a scan to test scan functionality in order to verify that the scanner is working properly. The scanned images are displayed in Central.

Changing any of the configuration options activates the **Save**  button in the lower-right corner of the screen. Clicking **Save** saves any changes. Clicking another tab displays the **Save** dialog window.



Clicking **Yes** saves any changes, closes the window, and displays the newly selected screen. Clicking **No** closes the window and displays the newly selected screen without saving changes. Clicking **Cancel** closes the window without saving changes and redisplay the **Settings** screen.

## Next Topics

The next chapter discusses the Review chevron. In the next chapter, images are reviewed for voter intent, write-in candidates are added, and issues are resolved. To continue, see [Review Chevron, starting on page 113](#).



CHAPTER 8

Review Chevron

This chapter describes the individual screens in the Review workflow and includes the following sections:

About the Review Chevron .....114

Using the Review Workflow.....115

Resolving Ballots .....116

Write-In Candidates Tab.....128



# About the Review Chevron

Using the **Review** chevron, users can review and analyze voter marks on ballots for voter intent.

## Analyzing Ballots

Every printed ballot is printed on a sheet (or more) of paper consisting of two sides: the front side and the back side of the sheet of paper. Each side of a sheet is a page. If a ballot has writing on the front and back sides, it has 2 pages. Ballots can consist of one to many pages.

A ballot page can be flagged as rejected for the following reasons:

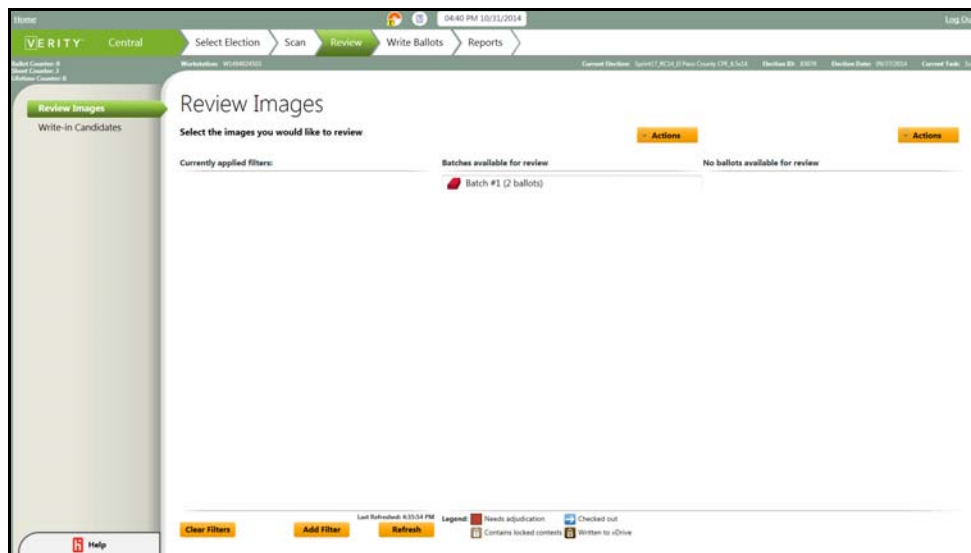
- If the election ID of the ballot does not match the election ID of the current election
- If the ballot type does not match the media type of the current task
- If the setting for allowing duplicate IDs is disabled and a ballot is scanned with a previously scanned ID
- If the bar codes on the ballot cannot be read clearly
- Any defect that causes the ballot not to be scanned clearly

A ballot sheet is flagged as rejected for the following reasons:

- Ballot contains a page that has been flagged as rejected
- Ballot pages have differing Precinct IDs
- Ballot pages have differing variation numbers
- Ballot pages have differing IDs
- Ballot pages have non-sequential page numbers
- The setting for allowing incomplete multi-sheet ballots is disabled and a ballot is scanned with missing pages

# Using the Review Workflow

The **Review** workflow contains tabs that enable users to review scanned ballots for invalid marks and write-ins. Flagged mismarked ballots (that is, undervotes, overvotes, and other marks) must be reviewed for voter intent in Central. Clicking the **Review** chevron opens the **Review Images** screen by default.



The chevron workflow offers two options:

- **Review Images**: Opens the **Review Images** screen. Allows the user to filter and review ballots and resolve voter intent issues.
- **Write-in Candidates**: Opens the **Write-in Candidates** screen. Allows the user to manage write-in candidate choices for contests. These candidates can be selected during a ballot review.

# Resolving Ballots

After scanning a batch of ballots, ballots with possible voter intent issues are flagged for adjudication. These ballots may have marks requiring visual verification to determine the voter's intent when selecting a candidate, a choice for a proposition, or a name for a write-in candidate.

When working with multiple Central workstations, users can review ballots through a centralized database. Central blocks access to ballots that are currently open by another user, ensuring no vote-resolution duplication.

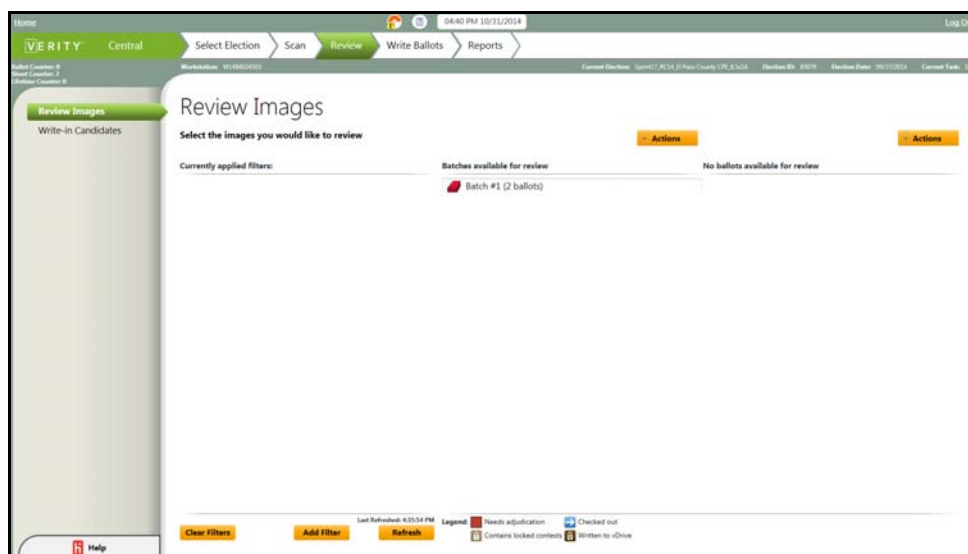
Users adjudicate flagged ballots through the **Review Images** tab.

## Review Images Tab

The **Review Images** tab enables users to filter, select, and review contests and ballots.


**Review Images**

Clicking the **Review** chevron displays the **Review Images** tab.

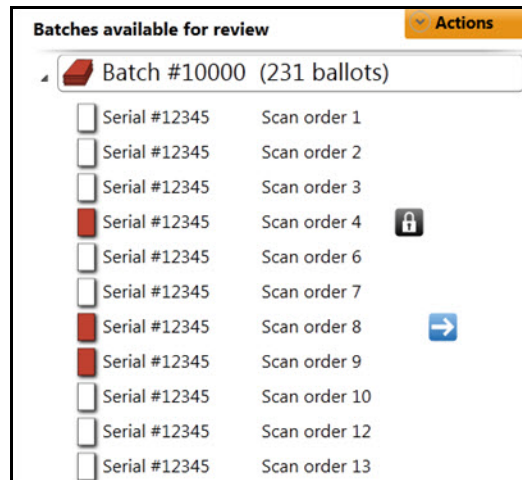


The **Review Images** screen displays a list of currently applied filters for grouping ballots on the left, available batches to review in the center, and ballots available for review on the right. To filter the ballot list, the user can add a filter using the **Add Filter** **Add Filter** button at the bottom of the screen.

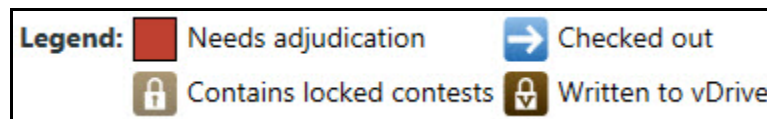
Clicking the **Clear Filters**  button removes all filters.

Clicking the **Refresh**  button refreshes the list of currently applied filters. Users on networks with multiple Central workstations may find this especially useful.

Each batch listed in the **Batches available for review** section can be expanded to review each ballot matching the filters. The batch and the listed ballots display a color coded icon or a graphic icon depicting status.

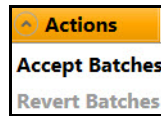


A legend at the bottom of the screen indicates icon meanings.



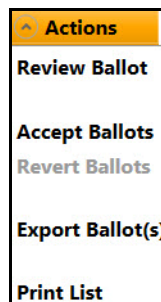
- **Needs adjudication:** The batch or ballot requires review to verify voter intent and make any necessary adjustments.
- **Checked out:** The ballot or batch is currently open and under review by a user on a client (networked) Central workstation.
- **Contains locked contests:** The ballot or batch contains locked contests and cannot be modified.
- **Written to vDrive:** The batch or ballot has already been written to a vDrive.

Users can either accept batches or revert batches from the **Batches available for review Actions** drop-down list.



Clicking **Accept Batches** means that all of the contests in the batch are accepted in the current state (with or without revision). **Revert Batches** means that all of the contests in all of the ballots in the batch are reverted from their adjudicated states back to the state each contest was in when scanned.


The **Actions** drop-down list for batches enables users to perform the options listed in the following image.

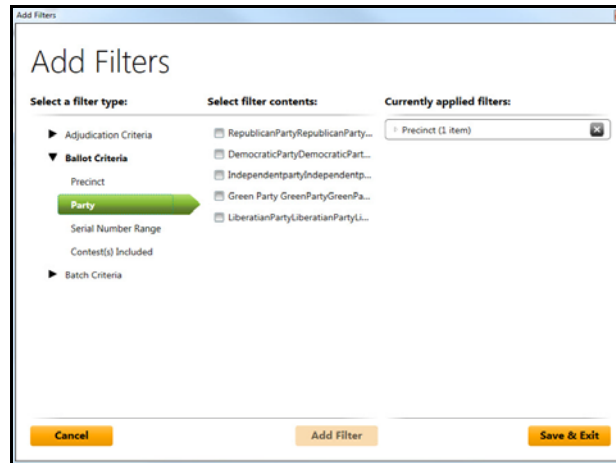



- **Review Ballot:** Opens the Ballot Review window for adjudicating selected ballots. Users can also double-click on a ballot to open the Ballot Review window.
- **Accept Ballots:** Accepts all unresolved contests in the ballots selected.
- **Revert Ballots:** Reverts every contest in the ballots selected to the original state when scanned.
- **Export Ballot(s):** Exports the ballots selected to an external media device.
- **Print List:** Generates and displays the **Review Images** report.

## Filtering Ballots

Users add filters to group together ballots needing review. Each filter can include user-selected criteria to refine the search results and lists of available batches and ballots.

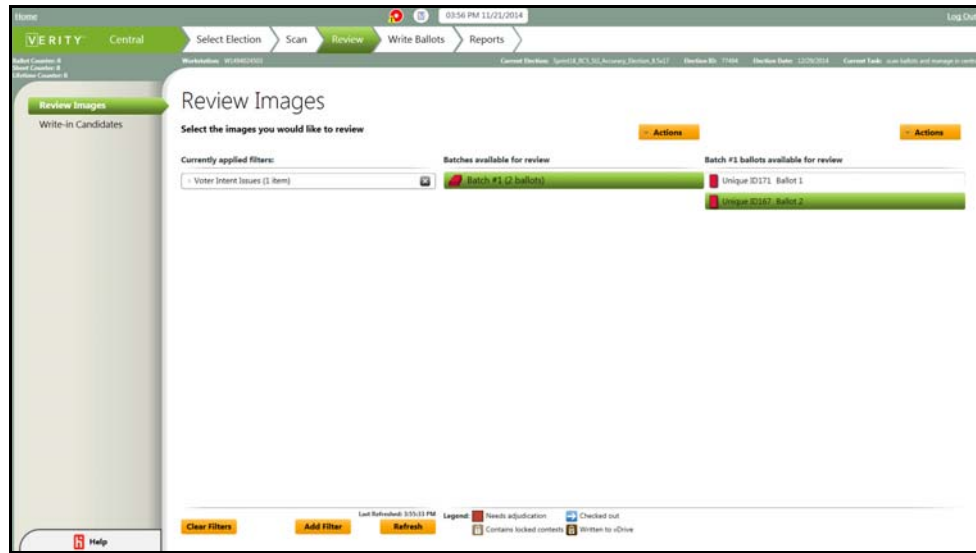
To add a ballot filter, the user clicks the **Add Filter**  button. The **Add Filters** window displays options for selecting filter types.




Users click to expand the **Select a filter type** lists and then select filter types. Selecting filter types displays filter options in the **Select filter contents** list. Clicking the **Add Filter**  button adds the filter to the **Currently applied filters** list.

Clicking **Save and Exit**  closes the **Add Filters** window and displays the filter in the **Currently applied filters** list. Clicking the **Cancel**  button closes the window without applying the filter.

Available batches and ballots matching the filter criteria display on the **Review Images** screen.



Clicking the **Delete Filter**  button on the **Currently applied filter** item deletes the filter from the list.

Filters are dependent upon voting types imported into Build. They might include more, fewer, or different options than the three listed in the following table. The following are examples, only.

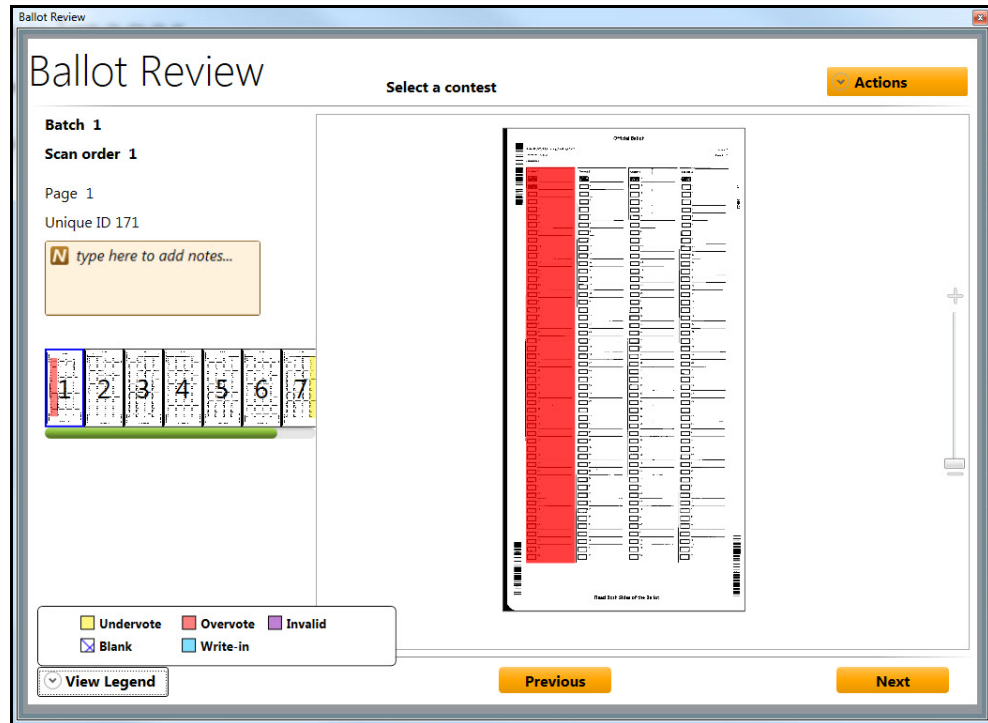
Filter Type	Filter Criteria	Filter Content Options
Adjudication Criteria	Ballot Status	<ul style="list-style-type: none"> <li>Has Unresolved Voter Intent Issues</li> <li>No Unresolved Voter Intent Issues</li> </ul>
	Voter Intent Issues	<ul style="list-style-type: none"> <li>Invalid Vote</li> <li>Blank Ballots</li> <li>Over Votes</li> <li>Under Votes</li> <li>Voted Write-Ins</li> </ul>
	User Action	<ul style="list-style-type: none"> <li>Accepted By User</li> <li>Resolved By User</li> <li>No Contest Modified</li> </ul>



Filter Type	Filter Criteria	Filter Content Options
Ballot Criteria	Precinct	List of precincts/precinct splits in the election definition
	Party	List of all parties included in the election definition. This filter is available only in a closed primary election.
	Unique ID Range	Low and high bounds for the unique ID range
	Contest(s) Included	List of all contests in the election definition
Batch Criteria	Scanning Workstation	List of available Central Workstations
	Voting Type	<ul style="list-style-type: none"> <li>• Absentee Voting</li> <li>• Election Day Voting</li> <li>• Early Voting</li> </ul>
	Batch ID	List of batch IDs
	Batch Status	<ul style="list-style-type: none"> <li>• OK At Scan</li> <li>• Resolved</li> <li>• Unresolved</li> <li>• Written</li> </ul>

## Reviewing Ballots

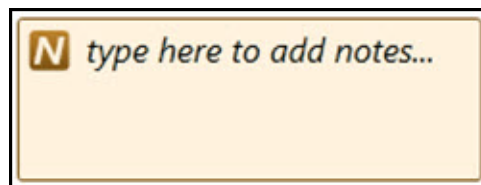
Double-click a ballot in the **Batch # ballots available for review** list to open it, or click to select the ballot and then select **Review Ballot** from the **Actions** list. The ballot displays in the **Ballot Review** screen.





On the left side of the screen, the following ballot details display:

- The batch ID
- The scan order number
- The ballot page currently in view
- Unique ballot ID
- Contest title, available when a contest is selected
- Description of the status, available when a contest is selected

A **Notes** section enables the user to enter information about the ballot.

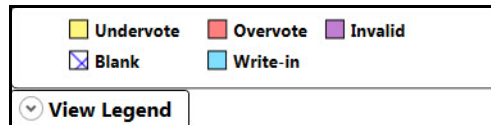


Below the notes box are thumbnails of each ballot page. Clicking a thumbnail displays the selected page.

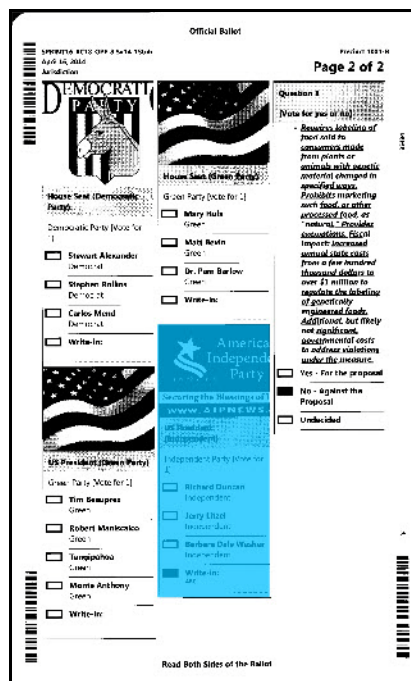
The **Previous**  and **Next**  buttons at the bottom of the window function as scroll buttons that enable users to view pages backward and forward throughout the ballot.

A legend depicts voter intent issues in color codes and patterns. Any contest with a voter intent issue is highlighted in a specific color or pattern.

Clicking **View Legend** opens and closes the legend at the bottom left of the **Ballot Review** window.



The focal image in the window is the current page of the selected ballot. Viewing the ballot pages, users can determine voter intent issues by referring to the **Legend**. Users can click each contest to review the issue and adjudicate a choice.



A slider to the right of the ballot page allows the user to zoom in and out of the ballot image to change the view of voter marks to determine intent. Central supports seven zoom levels.



At the top right corner, an **Actions** drop-down list provides options that users can perform on the contest or page under review.

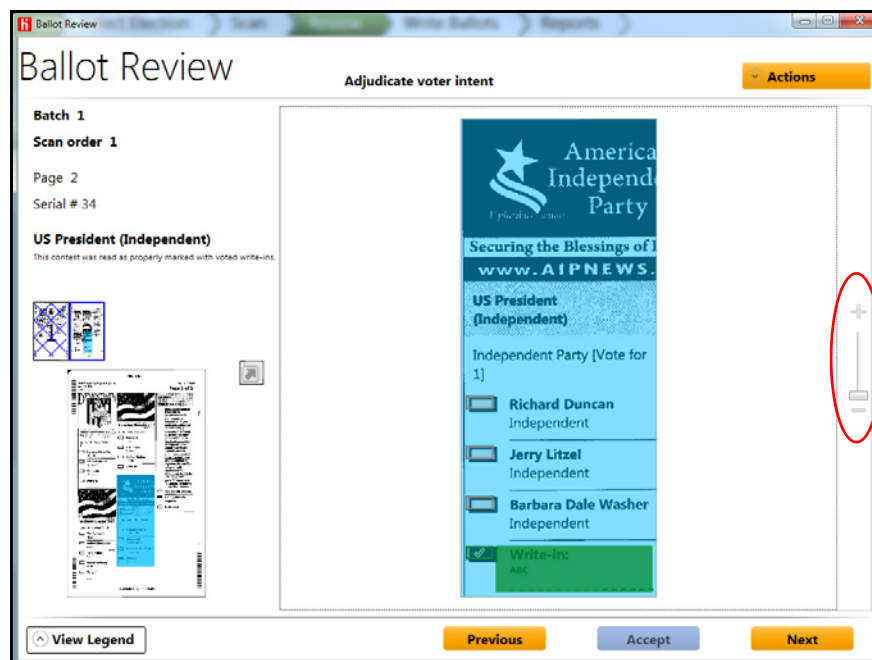


- **Print Contest/Page:** Prints the selected contest/page. Bar codes are redacted from the print out.
- **Export Contest/Page:** Exports the contest/page to an external media device.
- **Show/Hide Annotations:** Hides or shows the color or pattern overlays.
- **Unlock/Lock Contest/Page:** Locks the contest/page. This option displays Unlock if the contest/page is locked.
- **Accept Contest/Page:** Accepts every unresolved contest on the ballot page.
- **Revert Contest/Page:** Reverts the contest/page to its original state when scanned. The option is disabled by default and is enabled when a contest/page has been changed.

## Reviewing a Contest

Contests are reviewed for the purpose of adjudication. A user clicks a highlighted contest to view the contest, review voter marks and write-in text, and adjudicate the ballot. First a ballot is viewed and analyzed for voter intent. After that, the ballot can be changed to correspond to the determined voter intent.

Opening a ballot displays the first page of the ballot in the **Ballot Review** window. Double-clicking a color coded contest zooms in on the contest for a clearer view. Users can move the zoom bar to increase or decrease magnification.

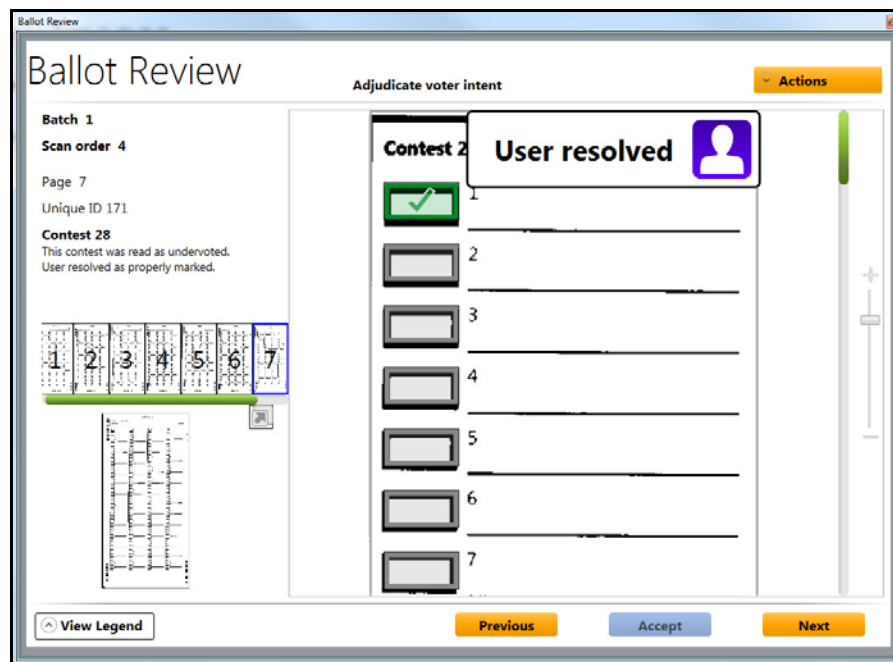


Clicking the **Actions** drop-down menu provides options for contest adjudication.









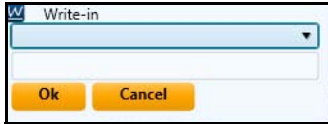
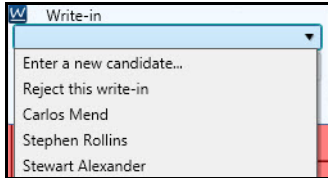
When a contest opens, the user can review the contest, review the available choices, and consider the voter's intent. The user determines the intent and selects the appropriate response for the voter, such as selecting a candidate name, a proposition option, or a write-in candidate from a list. Alternatively, no change may be made.

When a contest has been adjudicated, the color coding disappears. A message window displays the method of adjudication. In the case of the following example, the user resolved the issue.



The following table displays the status of a contest based on adjudication selections.

Mark Status	Description
Unmarked 	Unmarked highlighted selections are gray bordered. Any scanned marks by the voter are displayed through the highlighting to determine voter intent. When moused over, the following status displays: 

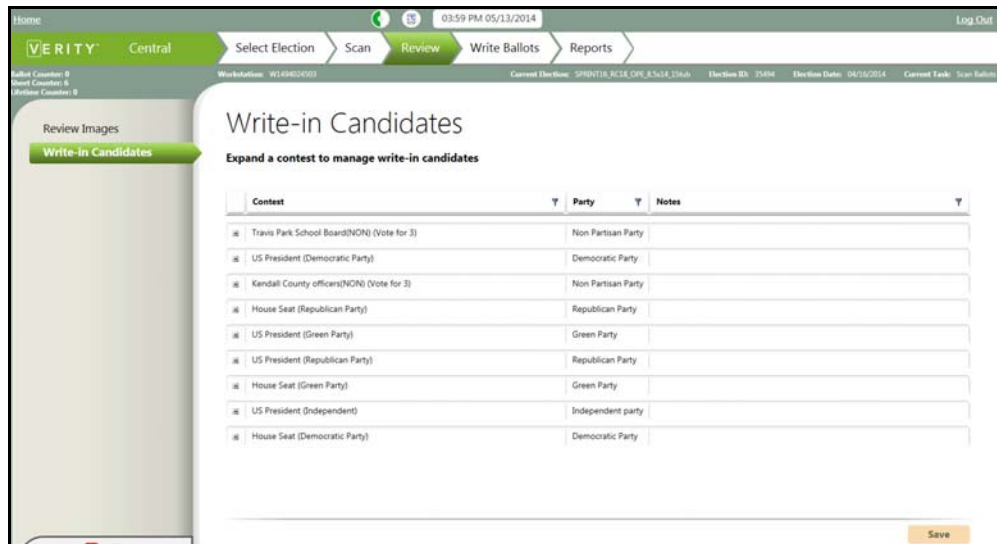
Mark Status	Description
<p>Marked</p> 	<p>Marked highlighted selections are green with a check mark. When a user determines the voter's intent, and selects a contest option, the unmarked icon changes. When moused over, the following status displays:</p> 
<p>Write-In Selection</p> 	<p>Contests with a write-in vote display a green checked icon and instructions to <b>Click to resolve</b>.</p>  <p>The user clicks on the entry to resolve the write-in. The <b>Write-in</b> window opens for the user to select a certified candidate from a drop-down list.</p>  <p>Choices could include something like the following. Choices are contest-dependent.</p>  <ul style="list-style-type: none"> <li>• List of candidates to select from</li> <li>• <b>Enter a new candidate...</b> to add a certified candidate; see <a href="#">Write-In Candidates Tab, starting on page 128</a></li> <li>• <b>Reject this write-in...</b> to reject the write-in contest</li> </ul> <p>Clicking <b>OK</b> saves the selection and closes the window. Clicking <b>Cancel</b> closes the window without saving.</p>

# Write-In Candidates Tab

The **Write-in Candidates** tab allows users to add, edit, and delete candidates.

**Write-in Candidates**

Clicking the **Write-in Candidates** tab displays the **Write-in Candidates** screen.



When a voter votes for a write-in candidate, the contest is flagged as a Write-In contest requiring review. These contests are resolved through the **Review Images** screen.

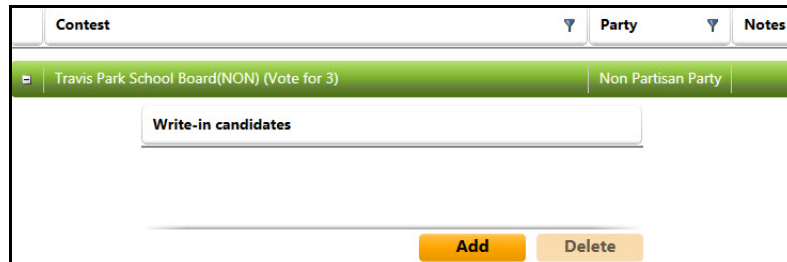
Users manage the write-in candidates in the **Write-In Candidates** screen. As names are added or edited through this screen, the names can be viewed and selected when reviewing the ballot images.

All possible candidate options are listed on the screen, separated by election contest. To review, manage, and add candidates for write-in selection, the user selects a contest from the list. The contest expands with a list of available candidates and options. The **Add** button adds a write-in candidate for the selected contest. The **Delete** button removes the write-in candidate from the selected contest. Modifying write-in candidates does not affect the candidates listed on the ballot in a contest.



## Adding Candidates

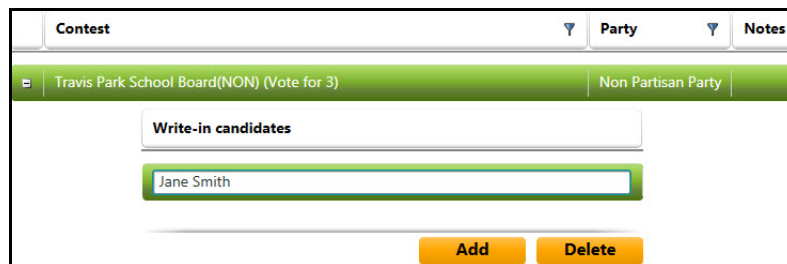
To add a write-in candidate, users select and expand a contest from the displayed list. The contest expands displaying the current list of candidates. The user clicks **Add** to enter a new name to the list.



The screenshot shows a web interface for adding write-in candidates. At the top, there are three tabs: 'Contest', 'Party', and 'Notes'. Below the tabs, a green header bar displays 'Travis Park School Board(NON) (Vote for 3)' and 'Non Partisan Party'. Underneath, there is a text input field labeled 'Write-in candidates'. At the bottom right, there are two buttons: 'Add' (orange) and 'Delete' (light orange).

## Editing Candidates

To edit the name of a candidate in the list, the user expands a contest and locates the name to edit. Double-clicking the candidate opens the name into a field to edit.

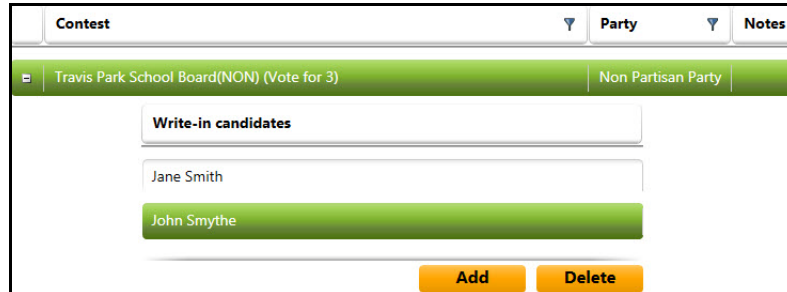


The screenshot shows the same interface as the previous one, but with a candidate name 'Jane Smith' entered in the 'Write-in candidates' field. The field is highlighted with a green border, indicating it is active for editing. The 'Add' and 'Delete' buttons are still visible at the bottom right.

After making changes, the user can click **Save** to update the changes. Saved changes are available for write-in options when reviewing a ballot with voted write-in candidates. The user can also export a report on the write-in candidates.

## Deleting Candidates

To remove a write-in candidate, users select and expand a contest from the displayed list.



The screenshot shows a web interface for managing write-in candidates. At the top, there are three tabs: 'Contest', 'Party', and 'Notes'. The 'Contest' tab is selected. Below the tabs, there is a list of contests. The first contest, 'Travis Park School Board(NON) (Vote for 3)', is expanded. This expansion reveals a section titled 'Write-in candidates' which contains a list of candidates. The first candidate is 'Jane Smith' and the second is 'John Smythe'. At the bottom of the expanded section, there are two buttons: 'Add' and 'Delete'.

The contest expands displaying the current list of candidates. The user selects a candidate to remove and clicks **Delete**.

## Next Topics

Prior to closing polls for the task, all completed and ready batches must be written to vDrives. For details, see [Write Ballots Chevron, starting on page 131](#).

CHAPTER 9

Write Ballots Chevron

This chapter describes the individual screens in the Write Ballots workflow and includes the following sections:

Using the Write Ballots Workflow. ....132

Write Ballots Tab .....133

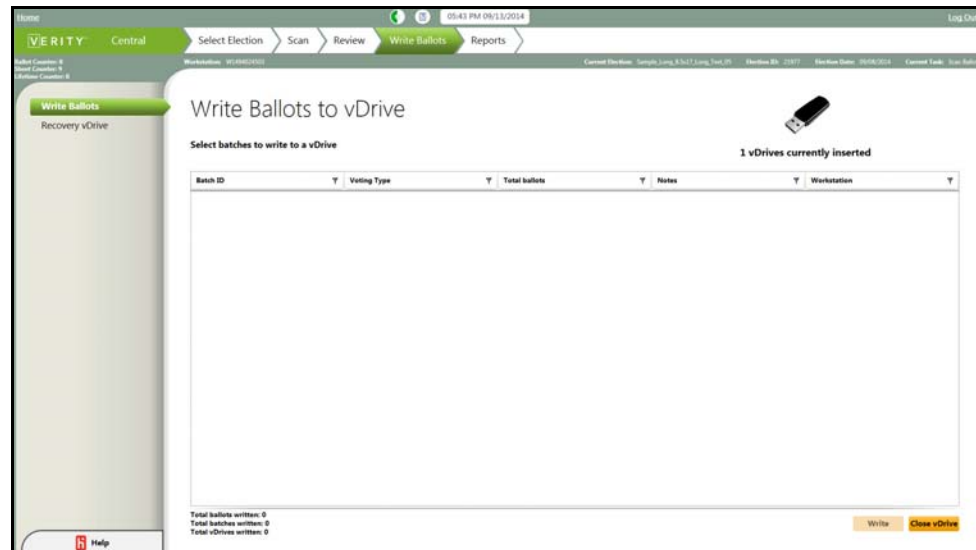
Recovery vDrive Tab .....135



# Using the Write Ballots Workflow

The **Write Ballots** chevron allows the user to write all ballots to vDrives and to create recovery vDrives for the opened task.

When the chevron is selected, the **Write Ballots to vDrive** screen opens:



The chevron includes two options:

- **Write Ballots**: Write ballots to vDrive
- **Recovery vDrive**: Create recovery vDrive

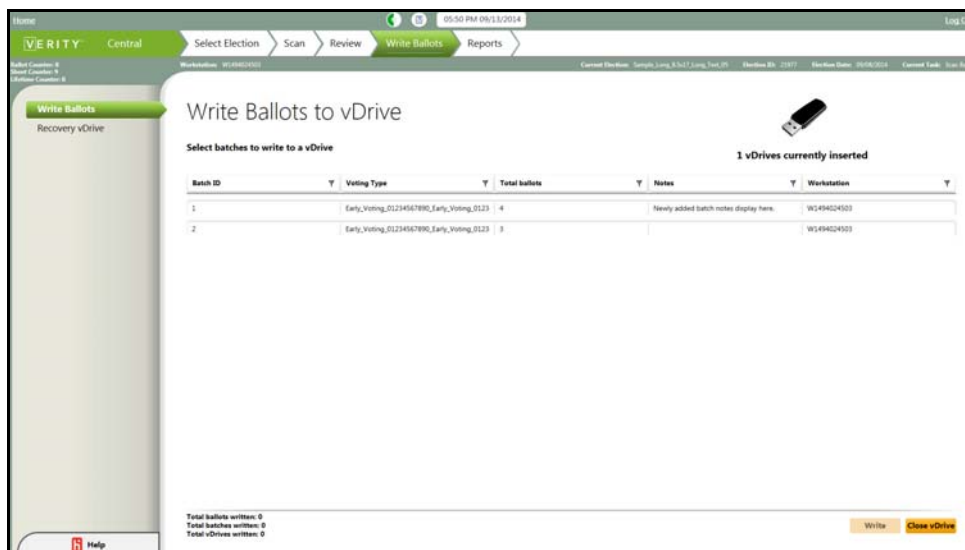
Prior to closing polls for a task, all of the available batches must be written to vDrives for transfer to other Verity Voting system components. On vDrives are written, the polls can be closed.

# Write Ballots Tab

The **Write Ballots** tab allows users to write all scanned batches of ballots to vDrives through the **Write ballots** screen.

## Write Ballots

Clicking the **Write Ballots** tab displays the **Write Ballots to vDrive** screen.

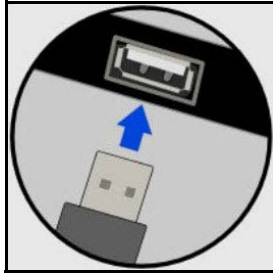


If batches have been processed, the screen displays the list of batches available for writing to vDrives. When ballot batches are written to a vDrive, the batches cannot be selected and written to other vDrives. Once written, batches no longer display on the screen.


The list includes the following information:

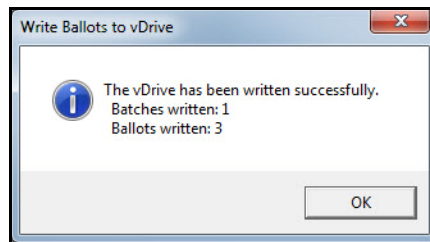
- **Batch ID:** Id for the batch set when scanned
- **Voting Type:** The selected voting type for the batch
- **Total Ballots:** The number of ballots scanned in the batch
- **Notes:** Notes for the batch
- **Workstation:** Id for the Central workstation that scanned the batch

To write batches to a vDrive, the user inserts a vDrive into a USB port.

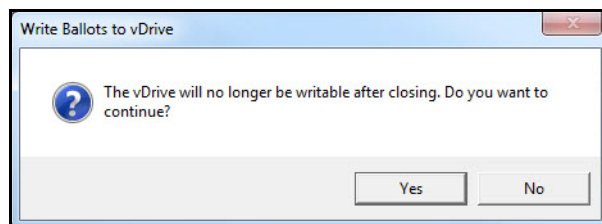


Then the user clicks to select one or more batch entries (using **shift+click** enables users to select multiple batches).

Clicking the **Write**  button writes the batches to a vDrive. When the batch of ballots has been written, the **Write Ballots to vDrive** window displays.

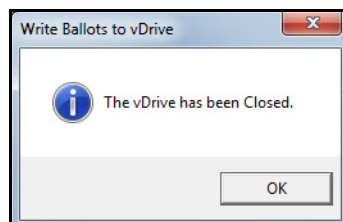


Clicking **OK** closes the window. After writing the content, an entry is added to the **Recovery vDrive** screen. When the vDrive is full, or when all data has been written to the vDrive, it can be closed by clicking **Close vDrive**. The **Write Ballots to vDrive** dialog window displays.



Clicking **No** closes the dialog window without closing the vDrive.

Clicking **Yes** locks the vDrive and closes the dialog window. The **Write Ballots to vDrive** window states that the vDrive has been closed.



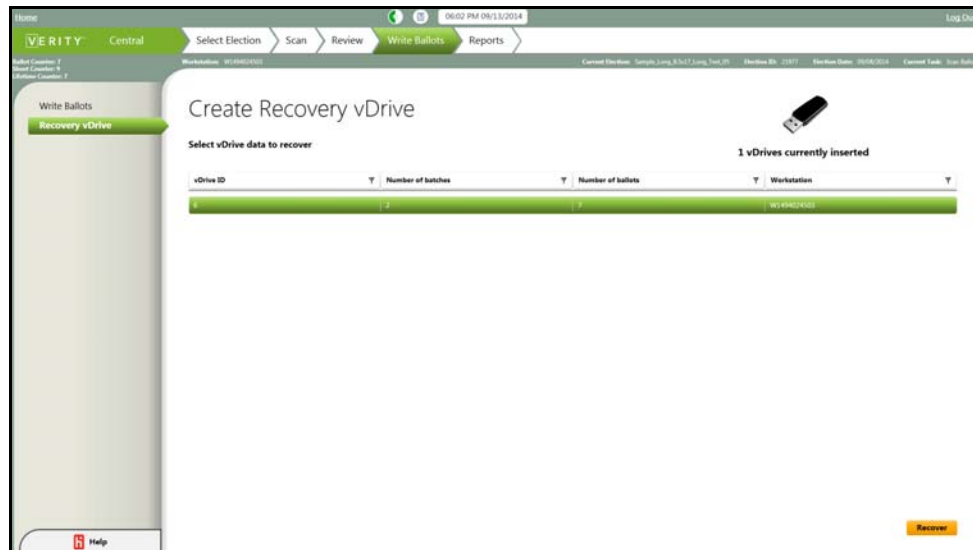
Clicking **OK** closes the window.

# Recovery vDrive Tab

The **Recovery vDrive** tab enables users to create a new vDrive to replace damaged or lost vDrives.

## Recovery vDrive

Clicking the **Recovery vDrive** tab displays the **Create Recovery vDrive** screen.




If the vDrive containing batches is determined to be damaged or is lost, the user can create another vDrive. Previously written vDrives are listed on the **Recovery vDrive** screen. Each line includes the following information:

- **vDrive ID:** ID of the of vDrive
- **Number of batches:** The number of batches that were written to the original vDrive
- **Number of ballots:** The total number of ballots written to the original vDrive
- **Workstation:** ID of the workstation that wrote the original vDrive

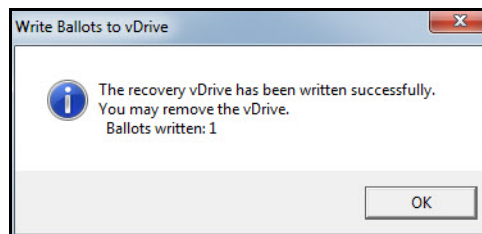
The **Recover** Recover button in the lower-right corner writes the selected entry to a new vDrive.

## Creating Recovery vDrives

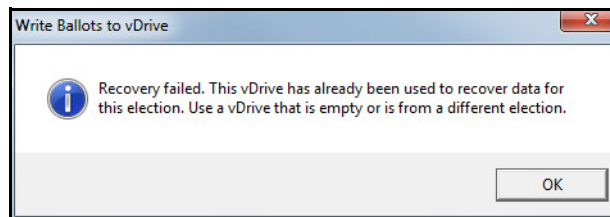
A vDrive is inserted into a USB port. Verity tests the vDrive to ensure it does not contain election data. If validated, the new vDrive receives a copy of all data written to the selected vDrive along with the original vDrive ID. The ID remains the same to ensure that the same election data cannot be tabulated twice.

To create a recovery vDrive, the user inserts a vDrive into a USB port, selects one vDrive entry, and clicks the **Recover**  button.

When the Recovery vDrive is successfully written, the Write Ballots to vDrive screen displays.



If the vDrive is already a recovery vDrive, the operation cannot be completed.



## Next Topics

After writing vDrives and creating recovery vDrives as needed, the user can continue to report generation and export options in the next chapter, [Reports Chevron, starting on page 137](#).



CHAPTER 10

# Reports Chevron

The chapter describes the individual screens in the Reports workflow and includes the following sections:

[Using the Reports Workflow](#) .....138

[Reports Tab](#) .....139

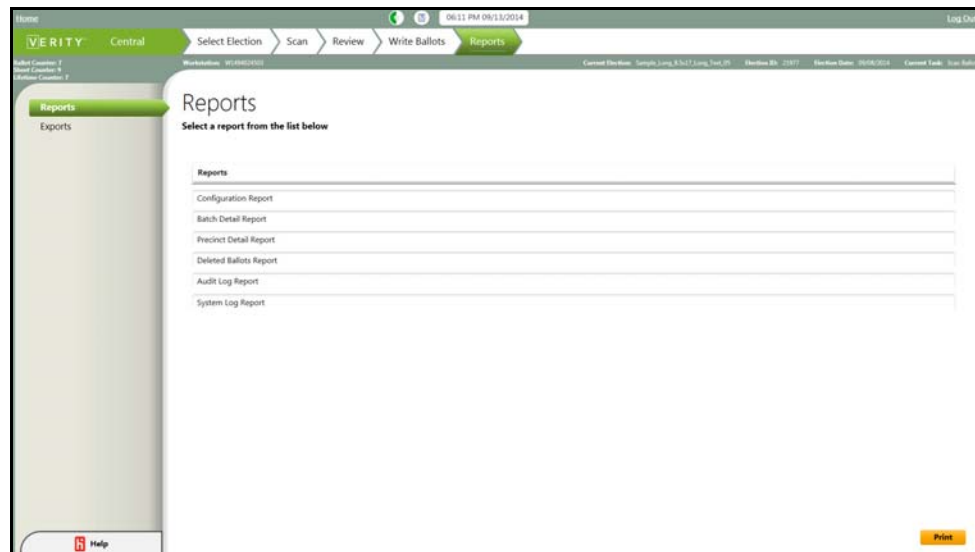
[Exports](#) .....143



# Using the Reports Workflow

The **Reports** chevron provides options to users for generating standard reports and exporting data.

When the **Reports** chevron is selected, the **Reports** screen opens.



The chevron includes two tabs:

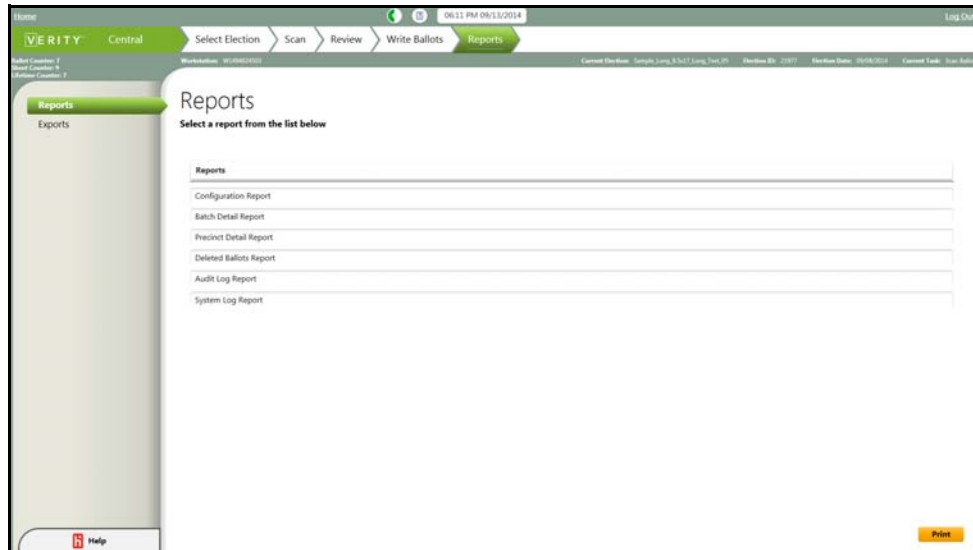
- **Reports**: Generate, view, and print reports
- **Exports**: Export selected data

# Reports Tab

The **Reports** tab enables users to generate and review reports. Reports can be viewed, exported, and printed.

## Reports

Clicking the **Reports** tab displays the **Reports** screen.




All reports include the following information in the report header:

- Report title
- Election title
- Election date
- Report label
- Jurisdiction name
- Date and time the report was generated
- Page numbering

Report PDF files can be printed on 8.5x11 paper.

Exported reports are automatically assigned a filename that includes the report name. Users can type over the auto-assigned report name.

## Working with Reports

To run a report, users click to select a report and then click the **Print**  button in the lower-right corner of the screen.

The report generates and displays on-screen to review, print, and export.

Batch Detail Report

Run Time 11:38 AM

Run Date 11/26/2014

Jurisdiction

ACC

Sprint18\_RC5\_SLI Accuracy Election\_8.5x17

12/29/2014

Page 1 of 221

Batch 1

Scanned: 11/17/2014 3:59:51 PM

Voting Type: Early Voting

User ID: user

Workstation: W1400021011

Notes: 1

Scan Order	Precinct Name	Page	Unique ID	Variation	Language	Party	Status	Rejection Reason
1	1	1	111	0	English		Scanned	
1	1	2	111	0	English		Scanned	
2	1	3	111	0	English		Scanned	
2	1	4	111	0	English		Scanned	
3	1	5	111	0	English		Scanned	
3	1	6	111	0	English		Scanned	
4	1	7	111	0	English		Scanned	
4	1	8	111	0	English		Scanned	

Verity Central provides the following report options:

- **Configuration Report:** Election, batch, and counter data
- **Batch Detail Report:** Batch and ballot detail
- **Precinct Detail Report:** Precinct, batch, and ballot detail
- **Deleted Ballots Report:** Details about deleted ballots
- **Audit Log Report:** All actions performed on the system
- **System Log Report:** All log entries

## Using Report Screen Functions


The user interface includes the following functions:

- Scroll bar on the right for viewing an entire page
- Toolbar at the top for navigating and saving reports




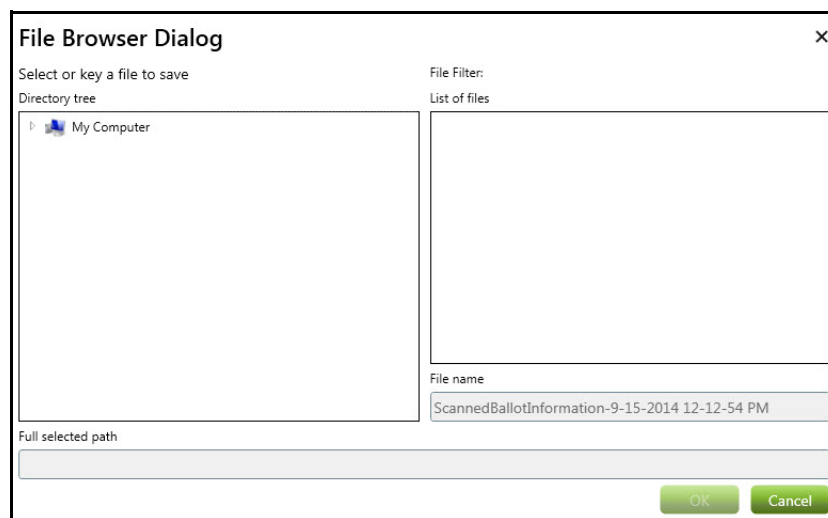
These tools enable the user to perform the following functions, appearing on the toolbar in order from left to right:


- Stop
- Go to the first page
- Go to the previous page
- Go to a specific page, or identify the page showing
- Go to the next page
- Go to the last page
- Print the report
- Export the report (save)

Clicking the **Close**  button in the upper-right corner of the screen closes the window.

## Exporting Reports

Reports can be exported as .pdf files. Clicking the **Export**  icon opens the **File Browser Dialog** window.

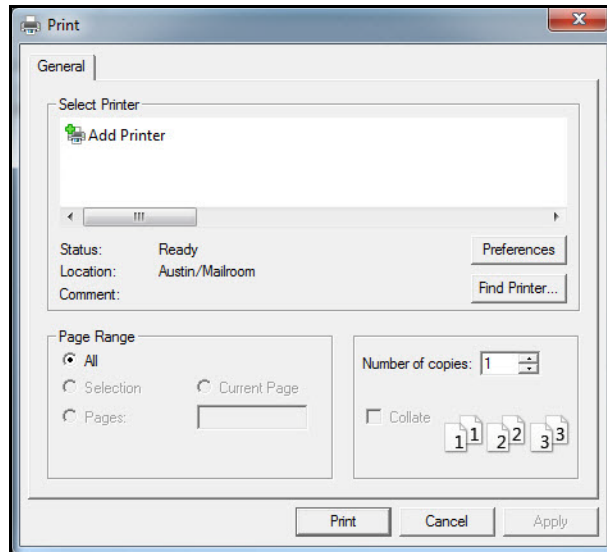


Users select the location to which the report should be exported (saved) and then click the **OK**  button at the bottom of the window.

Central automatically assigns a filename that includes the report name. Users can type over the auto-generated file name. Clicking **Cancel** closes the window without saving the report.

## Printing Reports

Clicking the **Print**  icon on the report screen opens the **Print** window.



Users select a printer from the list and click **Print**.

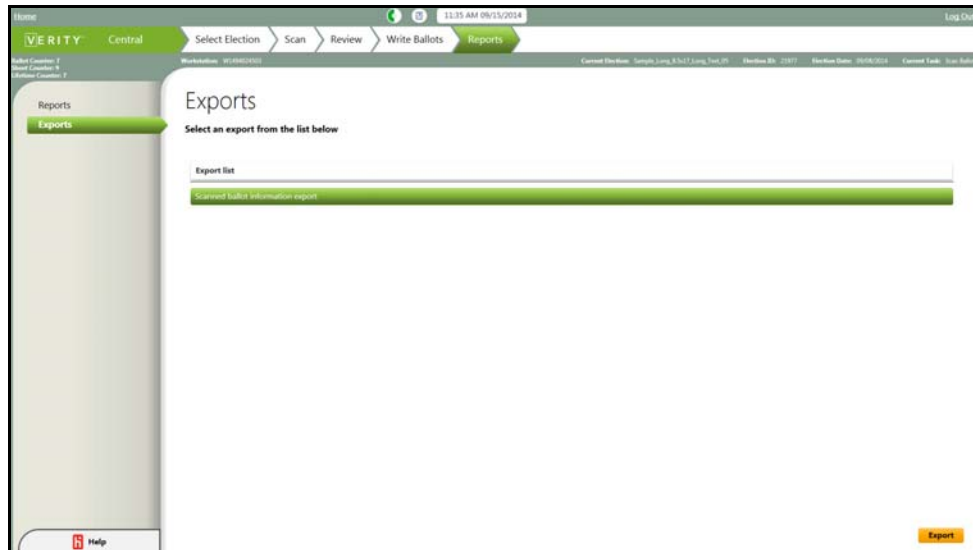
Reports fit on standard 8.5" x 11" paper.

Clicking **Print** sends the report to the selected printer. Clicking **Cancel** closes the **Print** window without printing.

For a complete set of sample reports, see the appendix [Sample Reports, starting on page 145](#).


# Exports

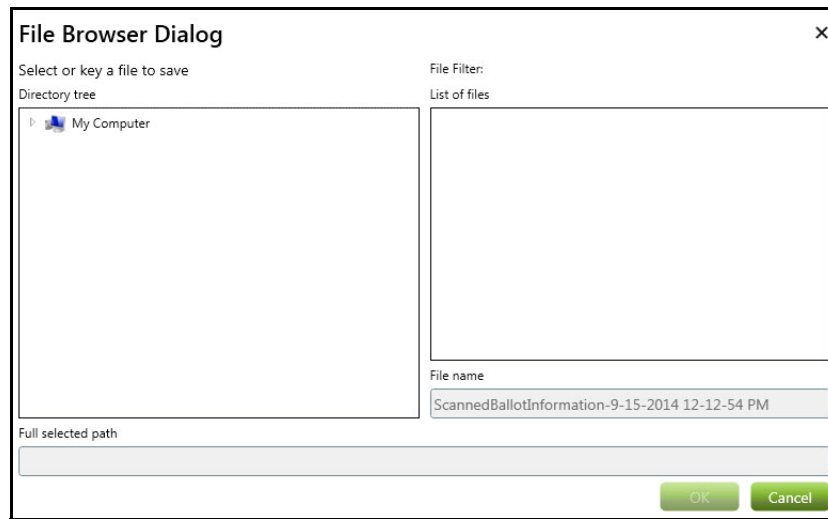
The **Export** screen allows the user to export election data for later use in third-party applications.



Data is exported in .csv format and includes the following content for each scanned ballot:

- Scan sequence number
- Precinct/Precinct Split name
- Page number
- Unique ID
- Variation number
- Language
- Party, for Closed Primary elections
- Status (*accepted* or *rejected*); if *rejected*, reason for rejection
- Indication if the ballot contains unresolved voter intent issues
- vDrive ID if the ballot has been written to a vDrive

Users click to select the export file and then click the **Export**  button in the lower-right corner of the screen. The **File Browser Dialog** window displays.



Users navigate to the export location and click **OK** to export the report.

## Next Topics

Following are appendices, beginning with [Sample Reports, starting on page 145](#).



## APPENDIX A

# Sample Reports

This appendix contains [General Report Requirements](#), as well as samples for each of the standard reports built in to the Verity Central application:

- [Configuration Report](#)
- [Batch Detail Report](#)
- [Precinct Detail Report](#)
- [Deleted Ballots Report](#)
- [Audit Log Report](#)
- [System Log Report](#)
- [Scanned Batch Report](#)

# General Report Requirements

All reports contain the following information in the header:

- Report Title
- Election Title
- Election Date
- The current task's Report Label
- Jurisdiction Name [VCS PRD 4.4.7.4.3]
- Date and Time the report was generated
- Page numbering

# Configuration Report

This report includes the following data:

- Task status
- Election ID
- Total number of batches scanned
- Total number of batches written to Election Media Devices
- Public Counter
- Private Counter
- Sheet Counter

Reports display in a separate window.

Configuration Report		Jurisdiction
Run Time	11:37 AM	ACC
Run Date	11/26/2014	Sprint18_RC5_SLI_Accuracy_Election_8.5x17
		12/29/2014
		Page 1 of 1
<b>Election ID</b>	77494	
<b>Election Status</b>	Polls Open	
<b>Total Scanned Batches</b>	14	
<b>Total Written Batches</b>	13	
<b>Ballot Counter</b>	728	
<b>Lifetime Counter</b>	844	
<b>Sheet Counter</b>	2912	

# Batch Detail Report

The primary sort order of this report is by Batch ID.

The secondary sort order of this report is by Scan Sequence Number.

This report includes the following information for each batch:

- Batch ID
- Date and time batch was scanned
- User ID of the user who scanned the batch
- Workstation Name where ballots were scanned
- Voting Type
- Number of ballots scanned in the batch
- Number of ballots deleted from the batch
- Current number of ballots in the batch
- Number of ballots with unresolved voter intent issues
- Number of ballots without unresolved voter intent issues
- Number of ballots written to an Election Media Device
- Batch Notes

For each batch, the following information for each ballot image scanned is included:

- Scan sequence number
- Precinct/Split Name
- Page number
- Unique ID
- Variation Number
- Language
- Party, if this is a Closed Primary election
- Status (accepted or rejected)
- If the Status is "rejected", reason for rejection
- Indication if ballot has been deleted
- Indication if ballot contains unresolved voter intent issues
- Election Media Device ID, if the ballot has been written to an Election Media Device



Reports display in a separate window.

Batch Detail Report

Run Time 11:38 AM  
Run Date 11/26/2014

Jurisdiction

ACC

Sprint18\_RC5\_SLI\_Accuracy\_Election\_8.5x17

12/29/2014

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Batch 1

Scanned: 11/17/2014 3:59:51 PM

Voting Type: Early Voting

User ID: user

Workstation: W1400021011

Notes: 1

Scan Order	Precinct Name	Page	Unique ID	Variation	Language	Party	Status	Rejection Reason
1	1	1	111	0	English		Scanned	
1	1	2	111	0	English		Scanned	
2	1	3	111	0	English		Scanned	
2	1	4	111	0	English		Scanned	
3	1	5	111	0	English		Scanned	
3	1	6	111	0	English		Scanned	
4	1	7	111	0	English		Scanned	
4	1	8	111	0	English		Scanned	
5	1	1	112	0	English		Scanned	
5	1	2	112	0	English		Scanned	
6	1	3	112	0	English		Scanned	
6	1	4	112	0	English		Scanned	
7	1	5	112	0	English		Scanned	
7	1	6	112	0	English		Scanned	
8	1	7	112	0	English		Scanned	
8	1	8	112	0	English		Scanned	
9	1	1	113	0	English		Scanned	
9	1	2	113	0	English		Scanned	
10	1	3	113	0	English		Scanned	
10	1	4	113	0	English		Scanned	
11	1	5	113	0	English		Scanned	
11	1	6	113	0	English		Scanned	
12	1	7	113	0	English		Scanned	
12	1	8	113	0	English		Scanned	
13	1	1	114	0	English		Scanned	

# Precinct Detail Report

This report contains the following information for each Precinct/Split:

- Precinct/Split Name
- Batch IDs that contain ballots from this Precinct/Split
- Date and Time batch was scanned
- Workstation Name where the batch was scanned
- Number of ballots scanned in the batch
- Number of ballots deleted from the batch
- Current number of ballots in the batch
- Number of ballots with unresolved voter intent issues
- Number of ballots without unresolved voter intent issues
- Number of ballots written to an Election Media Device

This report shall include the following information for each ballot image scanned in the batch:

- Scan sequence number
- Precinct/Split Name
- Page number
- Unique ID
- Variation Number
- Language
- Party, if this is a Closed Primary election
- Status (accepted or rejected)
- If the Status is "rejected", reason for rejection
- Indication if ballot has been deleted
- Indication if ballot contains unresolved voter intent issues
- Election Media Device ID, if the ballot has been written to an Election Media Device

**Note:** In the event that precinct information is not available for ballots, rejected ballots may be displayed in a separate and unlabeled section of this report.



Reports display in a separate window.

Precinct Detail Report

Run Time 11:39 AM

Run Date 11/26/2014

Jurisdiction  
ACC

Sprint18\_RC5\_SLI\_Accuracy\_Election\_8.5x17

12/29/2014

Page 1 of 234

1

Batch ID: 1

vDrive ID: 13

Scanned: 11/17/2014 3:59:51 PM

Workstation: W1400021011

Scan Order	Page	Unique ID	Variation	Language	Party	Status	Rejection Reason
1	1	111	0	English		Scanned	
1	2	111	0	English		Scanned	
2	3	111	0	English		Scanned	
2	4	111	0	English		Scanned	
3	5	111	0	English		Scanned	
3	6	111	0	English		Scanned	
4	7	111	0	English		Scanned	
4	8	111	0	English		Scanned	
5	1	112	0	English		Scanned	
5	2	112	0	English		Scanned	
6	3	112	0	English		Scanned	
6	4	112	0	English		Scanned	
7	5	112	0	English		Scanned	
7	6	112	0	English		Scanned	
8	7	112	0	English		Scanned	
8	8	112	0	English		Scanned	
9	1	113	0	English		Scanned	
9	2	113	0	English		Scanned	
10	3	113	0	English		Scanned	
10	4	113	0	English		Scanned	
11	5	113	0	English		Scanned	
11	6	113	0	English		Scanned	
12	7	113	0	English		Scanned	
12	8	113	0	English		Scanned	



# Deleted Ballots Report

Data in this report is grouped by Batch ID.

In each batch, ballot listings are sorted by Unique ID.

This report displays the following for each ballot that has been deleted after scanning:

- Unique ID
- Batch ID
- Voting Type
- Date and Time ballot was deleted
- User ID of the user who deleted the ballot
- Workstation Name of the workstation where the ballot was deleted
- Precinct/Split Name

This report shall display the following totals for each batch:

- Total number of ballots scanned in this batch
- Number of ballots deleted from this batch
- Current number of ballots in the batch

Reports display in a separate window.

Deleted Ballots Report			Jurisdiction ACC Sprint18_RC5_SLI_Accuracy_Election_8.5x17 12/29/2014 Page 1 of 2			
Run Time	11:39 AM					
Run Date	11/26/2014					
Unique ID	Voting Type	Deleted Date	User ID	Workstation	Precinct Name	Party
BatchID: 8						
3	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
4	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
6	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
7	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
8	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
111	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
112	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
113	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
114	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
115	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
116	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
123	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
124	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
125	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
126	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
127	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
128	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
128	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
129	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
130	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
131	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
132	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
133	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
133	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
134	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
135	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
136	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
137	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
138	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
139	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
140	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
141	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
142	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
143	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	
144	Absentee Voting	11/17/2014 17:03:28	user	W1400021011	1	

# Audit Log Report

Each Verity workstation contains an Audit Log. The report contains a list of all Verity activity associated with the election. The report clearly identifies in the header the software application or hardware device with which the audit log is associated. Audit logs are capable of being exported to PDF format.

This report displays the following:

- Activity log date and time
- Device ID
- User name
- Tags
- Event description
- Event data

When generating this report, the user first sees the **Report Settings** screen on which the user can select the start date and time and end date and time.



The screenshot shows a 'Report Settings' dialog box for an 'Audit Log Report'. It features two input fields for 'Start date & time' and 'End date & time'. The start date is set to '6/29/2014 12:00:00 AM' and the end date is set to '1/29/2015 12:00:00 AM'. At the bottom, there are two buttons: 'Show Report' and 'Cancel'.

Report Settings	
Audit Log Report	
Start date & time	End date & time
6/29/2014 12:00:00 AM	1/29/2015 12:00:00 AM
<div>Show Report Cancel</div>	



Then the user clicks **Show Report**. The report displays in a separate window.

# Audit Log Report

Run Time 11:42 AM  
Run Date 11/26/2014

Jurisdiction

ACC

Sprint18\_RC5\_SLI\_Accuracy\_Election\_8.5x17

12/29/2014

Page 1 of 9

Component: VerityCentral 18.7.17938SLI

ElectionId: 77494

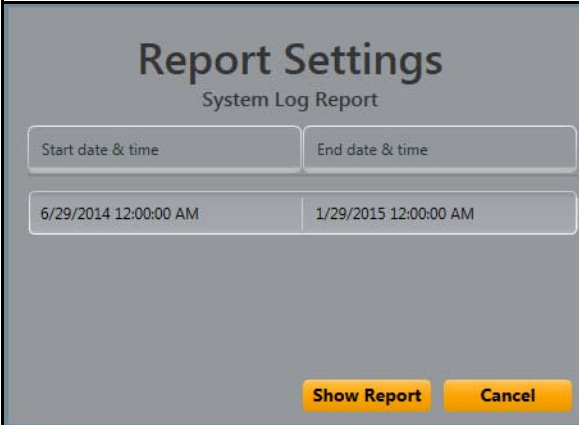
Row	Log Date & Time	Device ID	User	Tags	Event	Event Data
1	2014-11-25 02:57:26	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
2	2014-11-25 02:57:26	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
3	2014-11-25 02:57:26	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
4	2014-11-25 02:57:26	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
5	2014-11-25 02:57:26	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
6	2014-11-25 02:57:26	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
7	2014-11-25 02:57:26	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
8	2014-11-25 02:57:26	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
9	2014-11-25 03:15:33	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
10	2014-11-25 03:15:33	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
11	2014-11-25 03:15:33	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
12	2014-11-25 03:15:33	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
13	2014-11-25 03:15:33	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
14	2014-11-25 03:15:33	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.
15	2014-11-25 03:15:33	W1400021011	user1	ElectionManagement, Info	Election Open	The election 'Sprint18_RC5_SLI_Accuracy_Election_8.5x17' (77494) was opened.

# System Log Report

Verity includes a system log report for each Verity workstation. This report displays the following:

- Event log date and time
- Device ID
- Verity component
- User name
- Election ID
- Tags
- Event description
- Event data

When generating this report, the user first sees the **Report Settings** screen on which the user can select the start date and time and end date and time.



The screenshot shows a 'Report Settings' dialog box for a 'System Log Report'. It features two input fields for 'Start date & time' and 'End date & time'. The start date is set to '6/29/2014 12:00:00 AM' and the end date is set to '1/29/2015 12:00:00 AM'. At the bottom, there are two buttons: 'Show Report' and 'Cancel'.

Report Settings	
System Log Report	
Start date & time	End date & time
6/29/2014 12:00:00 AM	1/29/2015 12:00:00 AM
<div>Show Report Cancel</div>	



Then the user clicks **Show Report**. The report displays in a separate window.

System Log Report								
Page 1 of 31								
Run Time 11:42 AM Run Date 11/26/2014								
Row	Log Date & Time	Device ID	Component	User	Elec Id	Tags	Event	Event Data
1	2014-11-24 03:15:45	W1400021011	Verity	none	0	Authorizati on, Info	User Authorization	User 'user' log in is successful
2	2014-11-24 03:15:47	W1400021011	VerityCentral 18.7.17938SLI	user	0	Startup, Info	Application opened	
3	2014-11-24 03:15:47	W1400021011	VerityCentral 18.7.17938SLI	user	0	UI, Info	View loaded	View name: Select Election chevron
4	2014-11-24 03:15:47	W1400021011	VerityCentral 18.7.17938SLI	user	0	UI, Info	View loaded	View name: Select Election task
5	2014-11-24 03:15:49	W1400021011	VerityCentral 18.7.17938SLI	user	0	ElectionM anagemen t, Info	Election Open	The election 'SPRINT18_RC7_OPE _RCK_BallotTextimag e_8.5x14' (87320) was opened.
6	2014-11-24 03:15:49	W1400021011	VerityCentral 18.7.17938SLI	user	0	ElectionM anagemen t, Info	Election Open	The election 'SPRINT18_RC7_OPE _RCK_BallotTextimag e_8.5x14' (87320) was opened.
7	2014-11-24 03:15:49	W1400021011	VerityCentral 18.7.17938SLI	user	0	ElectionM anagemen t, Info	Election Open	The election 'SPRINT18_RC7_OPE _RCK_BallotTextimag e_8.5x14' (87320) was opened.
8	2014-11-24 03:15:49	W1400021011	VerityCentral 18.7.17938SLI	user	0	ElectionM anagemen t, Info	Election Open	The election 'SPRINT18_RC7_OPE _RCK_BallotTextimag e_8.5x14' (87320) was opened.
9	2014-11-24 03:15:49	W1400021011	VerityCentral 18.7.17938SLI	user	0	ElectionM anagemen t, Info	Election Open	The election 'SPRINT18_RC7_OPE _RCK_BallotTextimag e_8.5x14' (87320) was opened.
10	2014-11-24 03:36:58	W1400021011	VerityCentral 18.7.17938SLI	user	0	System, Info	Application closed	
11	2014-11-24 03:36:58	W1400021011	Verity	none	0	UI, Info	View loaded	View name: 'The user has been logged out.' message box
12	2014-11-24 03:36:58	W1400021011	Verity	none	0	Authorizati on, Info	User Authorization	User 'user' has been logged out due to inactivity

# Scanned Batch Report

The Scanned Batch Report is neither listed on or accessed from the Reports screen. The report can be accessed from two places:

- Scan Batch Complete dialog window after scanning a batch but before clicking Save
- Manage Batches screen by selecting a batch and running the report from the Actions drop-down list

For information about generating this report, see [Scan Chevron, starting on page 95](#).

This report displays the following information for a single scanned batch:

- All scan batch metadata
- A listing for each scanned image in the batch that displays:
  - Scan sequence number
  - Precinct/Split Name
  - Page number
  - Unique ID
  - Variation number
  - Language of the ballot
  - Party, if this is a Closed Primary election
  - Scan Status
  - If Scan Status is "rejected", the reason for the rejection
- The following totals for the batch:
  - Total images scanned
  - Total images accepted
  - Total images rejected
  - Total ballots scanned
  - Total ballots accepted
  - Total ballots rejected

The report displays in a separate window.

Scanned Batch Report		Jurisdiction		Batch ID: 1				
rescan ballots and manage in central		Sprint18_RC5_SLI_Accuracy_Election_8.5x17		Workstation: W1494024503				
Run Time: 5:49 PM		12/29/2014		Voting Type: Absentee Voting				
Run Date: 11/20/2014		Page 1 of 1						
<b>Batch Status:</b> UnResolved		<b>Scanned start time:</b> 11/20/2014 17:11:48		<b>Scanned end time:</b> 11/20/2014 17:12:00				
Scan Order	Precinct Name	Page	Unique ID	Variation	Language	Party	Status	Rejection Reason
1	1	8	171	0	English		Scanned	
1	1	7	171	0	English		Scanned	
2	1	6	171	0	English		Scanned	
2	1	5	171	0	English		Scanned	
3	1	4	171	0	English		Scanned	
3	1	3	171	0	English		Scanned	
4	1	2	171	0	English		Scanned	
4	1	1	171	0	English		Scanned	
<b>Total images scanned:</b>		8		<b>Total ballots scanned:</b>		1		
<b>Total images accepted:</b>		8		<b>Total ballots accepted:</b>		1		
<b>Total images rejected:</b>		0		<b>Total ballots rejected:</b>		0		



APPENDIX B

# User Interface Buttons

Buttons are very commonly used navigation tools because of their simplicity and ability to launch application processes.




In Central, inactive buttons are easily discerned from active buttons by looking at the button color. *Inactive* buttons are dimmed and cannot be clicked. A dimmed button is one that is a paler or milkier shade than its active counterpart. *Active* buttons are bright, indicating that the button can be clicked and that the function associated with clicking the button will be performed.













Buttons are activated when minimum requirements are met (usually associated with populating a text box). Not all buttons have an inactive form.
















The **Save** button in the following example depicts dim and active buttons.





The following table contains all of the buttons found within the Central application.

Button	Function
	Checked and unchecked <b>checkbox</b> buttons provided a toggle option for enabling options and content. Users can leave the checkbox unchecked to turn off the option, or click the checkbox to enable.
	Clicking the <b>filter icon</b> displays a list of filter options. The <b>yellow filter</b> identifies the active filter. Blue Filter icons are inactive (have no specified filter parameters configured).
	Clicking the <b>select all</b> filter button selects all items in list to be filtered. Clicking the <b>close filter</b> button closes the filter window.

Button	Function
	The <b>delete filter</b> button removes the filter from the Review Images screen.
	Clicking the <b>Match Case</b> button configures the sort function so that sort results are displayed by uppercase or lowercase, as specified by user.
	Clicking the <b>Expand</b> button causes the selected item to expand and display a new section with more detail.
	Clicking the <b>Collapse</b> button causes the expanded detail section to close from view.
	<b>Chevrons</b> are buttons. Clicking a chevron launches the corresponding process and displays the process home screen.
	Clicking the <b>Actions</b> button displays a drop-down list of the activity options available at a given point. This button is available on various screens with additional options. The selectable options differs per location in the application.
	The <b>Add Filter</b> button opens a screen to configure settings to add filters for various screens. These filters refine displayed data for performing tasks. This button is available on <b>Review</b> chevron screens.
	Clicking the <b>Cancel</b> button terminates the current function. Data is not saved when the <b>Cancel</b> button is clicked.
	The <b>Clear Filters</b> button removes any applied or added filters from a review screen. These filters refine the list of ballots and batches. This button is available on <b>Review</b> chevron screens.
	Clicking the <b>Close vDrive</b> button closes the vDrive so that no other batches can be written to it.
	The <b>Export</b> button and icon opens a window to export selected data options into CSV files. This button is available through the <b>Import/Export</b> chevron, <b>Export</b> screen.
	Clicking <b>Help</b> expands a screen to reveal context-sensitive information for the displayed screen. This button is always available across the entire interface.

Button	Function
	Clicking the <b>Home</b> button returns the user to the Verity Welcome screen.
	Clicking the <b>Log Out</b> button closes the current application and returns the user to the Verity Login screen.
	The <b>Next</b> buttons moves the display to the next sequential item.
	The <b>OK</b> button is active and can be clicked. Clicking <b>OK</b> indicates that the user accepts the conditions or options currently displayed in the active window, pane, dialog box, or other user interface element.
	Clicking the <b>Open</b> button opens the selected item. Open buttons can be active or inactive (dimmed).
	The <b>Previous</b> buttons displays the previous sequential item.
 	Print reports by clicking the <b>Print</b> button. When the <b>Print</b> button is clicked, a window displays print options or loads the report into a special window for reviewing, printing, and saving the content.
	Clicking the <b>Refresh</b> button re-displays the current screen.
	Clicking the <b>Save</b> button saves all of the data in all of the boxes in the active window, pane, dialog box, or other user interface elements.
	The <b>Save and Exit</b> button saves all of the data for the current screen and closes it, returning the user to the main interface.
	Clicking the <b>Save batch</b> button saves the scanned ballots as a batch of CVRs with the assigned type and notes. This button is available after scanning a batch of paper ballots.
	Clicking the <b>Scan</b> button initiates a scan of inserted paper ballots. This button only is available if a voting type is selected.
	The <b>Search</b> button launches the search function.
	The <b>Show Report</b> button prints the selected report to the screen.

Button	Function
	The View Legend button expands the legend to depict the definitions of colors and patterns.
	The <b>Write</b> button saves the selected CVR batches onto a vDrive for transport into other Verity Voting system components.

## APPENDIX C

# System Reference

## Save Message

When the user completes changes, they click the **Save** button. If the user changes screens or tabs prior to clicking **Save** for key information changes, a message displays asking if the system should save the changes or discard them.

This message displays when:

- Moving between screens and tabs with data to save prior to leaving the screen.
- Editing content through the interface and screens requiring to be saved.

## Database Issues

If any issues with database access or data occur in the Verity Voting system, messages are logged and the user notified. These issues include:

- If an error occurs, a message displays providing further details.
- When an error occurs, the Verity system attempts to roll back the database to the state prior to the action that caused the error.
- The system provides further messages regarding the success or failure of the rollback.

## Logging



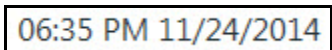



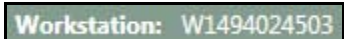


Verity provides a series of logs detailing all completed and failed actions taken through the system. These logs provide information for troubleshooting issues, tracking problems, and locating missing items.

Logs save automatically to a file. The content can also print directly to a printer in real time as actions take place.

## APPENDIX D

# Status Indicators

Verity Central contains status indicators that display throughout the application. Following is the list of Central status indicators with their meanings.

Indicator	Meaning
	Disk space indicator notifies user when disk space is available or getting full, respectively
	RAID indicator notifies user of RAID status
	Notifies user of time of day or night and date
	Displays the total number of ballots counted in the application*
	Displays the total number of sheets counted in the application*
	Total count of ballots over life of application*
	Workstation identification
	Name of the current election
	Election ID for the current election

Indicator	Meaning
<b>Election Date:</b> 12/29/2014	Date the current election is to occur
<b>Current Task:</b> scan ballots and manage in central	Currently viewed task in the application

When inside any election or task, at the top of the screen are three counters: Ballot Counter, Sheet Counter, and Lifetime Counter. When scanning ballots into Central, the Sheet Counter increments to reflect the number of sheets scanned into each batch, while the Lifetime Counter and Ballot Counter do not. The latter two counts will not increment until a ballot batch has been written to a vDrive.

**Note:** Counters across networked client/server workstations are refreshed with each new event (e.g, scanning ballots). These counters are updated each time a user exits and re-enters a task.



## APPENDIX E

# Verity Logging

## General Requirements

These requirements apply to all Verity components.

All Verity software systems (desktop or embedded) components write event logs during use.

Each component writes two logs:

- Application log: Election specific logging events including any changes to an election and any exceptions encountered in the application
- System log: Events pertaining to system actions such as login, password change, and so forth

Verity components do not allow the user to edit the logs

Verity components do not allow the user to disable logging

Logs support the following use cases:

- Verity vDrive (election media) device is capable of storing logging data
- Logs are transferable through remote transmission solutions
- The log format is compatible with use of an attached real-time audit printer that logs each tabulation software event as it is executed  
For example, some states require that tabulation software print to an attached line printer.

Auditable events are not described exclusively in technical codes.

Log data exports do not:

- Merge multiple data elements into a single field in the export file
- Include data elements without a clear indicator of content type

**Note:** The intent of these requirements is to avoid export formats that would not allow third-party systems to cleanly import data and perform computations and analysis on the data set.

Log data is tamper-evident.

Verity voting devices recover from a failure of the main power supply external to the voting system without loss or corruption of logging data.

Verity voting devices recover from errors without loss or corruption of logging data.

Immediately after the voter chooses to cast his or her ballot, all logging data related to the ballot is erased from the display, memory, and all forms of temporary storage.

# Log Location

The primary storage for logs is always non-volatile memory.

For desktop applications, application logs are stored on the application server workstation.

Voting devices store at least one redundant backup copy of each log.

Voting devices store the logs on the election media device (Verity vDrive). Voting device log data is aggregated and stored on the tabulation server when media devices are read into the tabulation station (Verity Count).

# Events That Must Be Logged

In general, any user interaction, system event, or change to data should be logged (with the exception of data that interferes with voter privacy or system security). At a minimum, the following events must be logged. However, this should not be considered an all-inclusive list.

Each entry includes all data required to reconstruct the event. For example:

- If a report is printed, the name of the report should be logged.
- If an election is restored from a backup, the file path of the backup should be logged.
- If an election is opened, the name or ID of the election should be logged.

## Authorization

The system logs the following:

- User Account creation events
- Authentication attempts and their results
- User Account change events
- User Account deletion events
- Password change attempts and their results
- Password resets

## Error Handling

**Note:** All error categories include recoverable errors. An example of a recoverable error is an "Out of paper" error.

The system logs all errors, including:

- System errors
- Hardware errors
- Application errors

Log entries for errors include at least:

- The source and disposition of system interrupts resulting in entry into exception handling routines
- Content of all messages generated by exception handlers

## Security

The following are logged:

- Version of current application software, on initialization
- Version of subcomponent hardware and software, when available
- Hashes of application software and subcomponent software, when calculated
- Digital signature or checksum verification and success/failure of attempt
- Verity Key read
- Verity Key write
- Verity Key delete

## General

The following are logged:

- Device/Application is initialized
- Device/Application is shut down
- Any information that can be used to reconstruct voter selections
- Any information about a voter's use of accessibility features
- Password, PIN, or authorization code values
- Any information received by:
  - Any data quality monitoring routine
  - Any software or hardware condition monitors

## Election Data

The system logs each of the following actions performed on any election dataset:

- Add
- Update
- Delete

These entries include the content of the changes made to the data.

## Desktop Application-Specific Events

### Election Management

Each of the following will be logged:

- Create election
- Open Election
- Rename election
- Backup election
- Delete election
- Copy election
- Restore election

### User Interface Navigation

**Note:** In order to fully reconstruct a sequence of events and provide necessary context, it is important to know what functional areas of the interface were accessed by the user.

The following are logged:

- Report generated
- Report printed
- Data imported
- Data exported
- Media device written
- Media device reset or formatted

## Networking

The following are logged:

- Network connection established
- Network connection lost
- Any security checks run and results of the security checks
- Any data transfer between applications

# Log Format

Verity will support standardized, structured, documented, and open standards to facilitate data exchange and reporting. (Standards such as OASIS EML and IEEE 1622 are just two examples of baselines that might be suitable to achieve such an objective.)

Log files will contain the following fields:

- Date and time
- Device ID
- Component
- User
- Election ID
- Tags
- Event
- Event data



# Reporting requirements

All Verity audit log reports clearly identify in the header the software application or hardware device with which the audit log is associated.

Verity audit logs are filtered on at least the following attributes:

- Election name
- Alphanumeric text (e.g., keywords)
- Time range
- Device serial number/Workstation ID

Verity audit logs are capable of being exported to PDF format.

Tabulation software are capable of exporting aggregated log information in a format compatible with a standard COTS software tool (such as Microsoft Excel or Microsoft Word).

# Notes

# Glossary

## A

### **abandoned ballot**

Ballot that the voter did not place in the ballot box or record as cast on DRE before leaving the polling place.

### **absentee ballot**

Ballot cast by a voter unable to vote in person at his or her polling place on Election Day.

### **acceptance testing**

Examination of a voting system and its applications by the purchasing election authority (usually in a simulated-use environment) to validate performance of delivered units in accordance with procurement requirements, and to validate that the delivered system is, in fact, the certified system purchased.

### **Access Board**

Independent federal agency whose primary mission is accessibility for people with disabilities and a leading source of information on accessible design.

### **accessibility**

Measurable characteristics that indicate the degree to which a system is available to, and usable by, individuals with disabilities. The most common disabilities include those associated with vision, hearing and mobility, as well as cognitive disabilities.

### **accessible voting station**

Voting station equipped for individuals with disabilities.

### **accreditation**

Formal recognition that a laboratory is competent to carry out specific tests or calibrations.

**accreditation body**

- (1) Authoritative body that performs accreditation.
- (2) An independent organization responsible for assessing the performance of other organizations against a recognized standard, and for formally confirming the status of those that meet the standard.

**accuracy**

- (1) Extent to which a given measurement agrees with an accepted standard for that measurement.
- (2) Loseness of the agreement between the result of a measurement and a true value of the particular quantity subject to measurement. Accuracy is a qualitative concept and is not interchangeable with precision.

**accuracy for voting systems**

Ability of the system to capture, record, store, consolidate and report the specific selections and absence of selections, made by the voter for each ballot position without error. Required accuracy is defined in terms of an error rate that for testing purposes represents the maximum number of errors allowed while processing a specified volume of data.

**active in count**

When a Locked for Tabulation election is opened in Verity Count, the state will change to Active in Count for tabulating and determining the winner of the election categories.

**adequate security**

Security commensurate with the risk and the magnitude of harm resulting from the loss, misuse, unauthorized access to, or modification of, information. This includes ensuring that systems and applications operate effectively and provide appropriate confidentiality, integrity, and availability, through the use of cost-effective management, personnel, operational, and technical controls.

**Air Gap**

A physical separation that describes how non-certified and certified voting system applications relate to each other and manage data. A variety of methods can support a physical “air gap,” primarily the absence of any network connection between non-certified and certified applications. These air gaps act as a physical firewall for all data and access ensuring integrity and security.

**alphanumeric**

When the term “alphanumeric” is used to define allowed values, it means the following Unicode characters are supported: 0x09, 0x0A, 0x20-0x7F, 0xA1, 0xC1, 0xE1, 0xC9, 0xE9, 0xCD, 0xED, 0xD1, 0xF1, 0xD3, 0xF3, 0xDA, 0xFA, 0xDC, 0xFC, 0xAB, 0xBB, 0xBF.

**alternative format**

The ballot or accompanying information is said to be in an alternative format if it is in a representation other than the standard ballot language and format. Examples include, but are not limited to, languages other than English, Braille, ASCII text, large print, recorded audio.

**application**

The main process that modules run in.

**application audit log**

Captures information for activities resulting from using the application or device, such as Verity login or logout, casting votes, poll worker interaction with a device, and inserting or removing vDrives.

The application audit log travels with CRV data and is used to track all of the activities that occur or are attempted on all machines along the voting process path. This log records every activity performed on or by the machine, indicating the event and when it happened.

**audio ballot**

A ballot in which a set of offices is presented to the voter in spoken, rather than written, form.

**audio-tactile interface (ATI)**

Voter interface designed to not require visual reading of a ballot. Audio is used to convey information to the voter and sensitive tactile controls allow the voter to communicate ballot selections to the voting system.

**audit**

Systematic, independent, documented process for obtaining records, statements of fact or other relevant information and assessing them objectively to determine the extent to which specified requirements are fulfilled.

**audit trail**

Recorded information that allows election officials to review the activities that occurred on the voting equipment to verify or reconstruct the steps followed without compromising the ballot or voter secrecy.

**audit trail for direct-recording equipment**

Paper printout of votes cast, produced by direct-recording electronic (DRE) voting machines, which election officials may use to crosscheck electronically tabulated totals.

**availability**

The percentage of time during which a system is operating properly and available for use.

**B**

**ballot**

The official presentation of all of the contests to be decided in a particular election. See also, [application audit log](#), [ballot image](#), [video ballot](#), [electronic voter interface](#).

**ballot configuration**

Particular set of contests to appear on the ballot for a particular election district, their order, the list of ballot positions for each contest, and the binding of candidate names to ballot positions

**ballot counter**

Process in a voting device that counts the votes cast in an election.

**ballot counting logic**

The software logic that defines the combinations of voter choices that are valid and invalid on a given ballot and that determines how the vote choices are totaled in a given election.

**ballot format**

The concrete presentation of the contents of a ballot appropriate to the particular voting technology being used. The contents may be rendered using various methods of presentation (visual or audio), language or graphics.

**ballot image**

Electronically produced record of all votes cast by a single voter. See also [cast vote record \(\)](#).

**ballot instructions**

Information provided to the voter during the voting session that describes the procedure for executing a ballot. Such material may (but need not) appear directly on the ballot.

**ballot measure**

- (1) A question that appears on the ballot for approval or rejection.
- (2) A contest on a ballot where the voter may vote yes or no.

**ballot position**

A specific place in a ballot where a voter's selection for a particular contest may be indicated. Positions may be connected to row and column numbers on the face of a voting machine or ballot, particular bit positions in a binary record of a ballot (for example, an electronic ballot image), the equivalent in some other form. Ballot positions are bound to specific contests and candidate names by the ballot configuration.

**ballot preparation**

Ballot preparation includes a series of procedures prior to running elections. Select the specific contests and questions to be contained in a ballot format and related instructions. Prepare and test election-specific software containing these selections. Produce all possible ballot formats. Finally, validate the correctness of ballot materials and software containing these selections for an upcoming election.

**ballot production**

Process of generating ballots for presentation to voters, e.g., printing paper ballots or configuring the ballot presentation on a DRE.

**ballot rotation**

Process of varying the order of the candidate names within a given contest.

**ballot scanner**

Device used to read the voter selection data from a paper ballot or ballot card.

**ballot style**

See [ballot configuration](#).

**BLM**

Ballot Layout Management (BLM) is the Verity Election Office module used to manage data such as ballot content, ballot formats, and ballot style previews.

**BMD**

Ballot Marking Device (BMD) is an electronic vote-capture device via an electronic voter interface that allows the voter to alter previously made choices without spoiling the ballot. After selections are marked and reviewed, the BMD produces a printed, human-readable paper ballot that reflects the voter's selections. The BMD does capture or retain any cast vote record data.

**BPS**

The Hart InterCivic Ballot Production Service (BPS) is a fee-based service that provides ballot programming and ballot printing service for customers who use Hart InterCivic voting devices.

## C

**candidate**

Person contending in a contest for office. A candidate may be explicitly presented as one of the choices on the ballot or may be a write-in candidate.



**candidate register**

Record that reflects the total votes cast for the candidate. This record is augmented as each ballot is cast on a DRE or as digital signals from the conversion of voted paper ballots are logically interpreted and recorded.

**canvass**

Compilation of election returns and validation of the outcome that forms the basis of the official results by political subdivision.

**cast ballot**

Ballot that has been deposited by the voter in the ballot box or electronically submitted for tabulation.

**cast vote record ()**

Permanent record of all votes produced by a single voter whether in electronic, paper or other form. Also referred to as [ballot image](#) when used to refer to electronic ballots.

**catastrophic system failure**

Total loss of function or functions, such as the loss or unrecoverable corruption of voting data or the failure of an on board battery of volatile memory.

**central count voting system**

A voting system that tabulates ballots from multiple precincts at a central location. Voted ballots are placed into secure storage at the polling place. Stored ballots are transported or transmitted to a central counting place which produces the vote count report.

**certification**

Procedure by which a third party gives written assurance that a product, process or service conforms to specified requirements. See also state certification and national certification.

**certification testing**

Testing performed under either national or state certification processes to verify voting system conformance to requirements.

**challenged ballot**

Ballot provided to an individual who claim they are registered and eligible to vote but whose eligibility or registration status cannot be confirmed when they present themselves to vote. Once voted, such ballots must be kept separate from other ballots and are not included in the tabulation until after the voter's eligibility is confirmed. Michigan is an exception in that they determine voter eligibility before a ballot is issued. See also [provisional ballot](#).

**checksum**

Value computed from the content of a document or data record. Typically this is the sum of the numeric representations of all the characters in the text. Checksums are used to aid in detecting errors or alterations during transmission or storage.

**claim of conformance**

Statement by a vendor declaring that a specific product conforms to a particular standard or set of standard profiles. For voting systems, NASED qualification or EAC certification provides independent verification of a claim.

**closed primary**

Primary election in which voters receive a ballot listing only those candidates running for office in the political party with which the voters are affiliated. In some states, non-partisan contests and ballot issues may be included. In some cases, political parties may allow unaffiliated voters to vote in their party's primary.

**commercial off-the-shelf (COTS)**

Commercial, readily available hardware devices (such as card readers, printers or personal computers) or software products (such as operating systems, programming language compilers, or database management systems).

**Common Industry Format (CIF)**

Refers to the format described in ANSI/INCITS 354-2001 "Common Industry Format (CIF) for Usability Test Reports."

**component**

Element within a larger system; a component can be hardware or software. For hardware, it is a physical part of a subsystem that can be used to compose larger systems (e.g., circuit boards, internal modems, processors, computer memory). For software, it is a module of executable code, that can be moved around as a whole that performs a well-defined function and interacts with other applications.

**confidentiality**

Prevention of unauthorized disclosure of information.

**configuration management**

Discipline applying technical and administrative direction and surveillance to identify and document functional and physical characteristics of a configuration item, control changes to these characteristics, record and report change processing and implementation status, and verify compliance with specified requirements.

**configuration management plan**

Document detailing the process for identifying, controlling and managing various released items, such as code, hardware and documentation.

**configuration status accounting**

An element of configuration management, consisting of the recording and reporting of information needed to manage a configuration effectively. This includes a listing of the approved configuration identification, the status of proposed changes to the configuration, and the implementation status of approved changes.

**conformance**

Fulfillment of specified requirements by a product, process or service.

**conformance testing**

Also known as certification testing, this is the process of testing an implementation against the requirements specified in one or more standards. The outcomes of a conformance test are generally a pass or fail result, possibly including reports of problems encountered during the execution.

**contest**

Decision to be made within an election, which may be a contest for office or a referendum, proposition and/or question. A single ballot may contain one or more contests.

**count**

Process of totaling votes. See [tabulation](#).

**counted ballot**

Ballot that has been processed and whose votes are included in the candidates and measures vote totals.

**corrective action**

Action taken to eliminate the causes of an existing deficiency or other undesirable situation in order to prevent recurrence.

**cross filing**

Also referred to as cross-party endorsement, this is the endorsement of a single candidate or slate of candidates by more than one political party. The candidate or slate appears on the ballot representing each endorsing political party.

**cryptographic key**

Value used to control cryptographic operations, such as decryption, encryption, signature generation or signature verification.

**cryptography**

Discipline that embodies the principles, means, and methods for the transformation of data in order to hide their semantic content, prevent their unauthorized use, prevent their undetected modification and establish their authenticity.

**cumulative voting**

A method of voting exclusive to multi-member district election (e.g. county board) in which each voter may cast as many votes as there are seats to be filled and may cast two or more of those votes for a single candidate.

**CCOS**

Central Count Optical Scan (CCOS). Paper ballot scanning system that processes marked paper ballots at a central location. CCOS systems are capable of reading marked ballots and saving cast vote records based on voter marks. Note: "Central Count Optical Scan" is a standard VVSG term that makes no assumptions about the technology used for scanning purposes. More specifically, "optical scan" may include digital scanning technology.

**COTS**

Commercial-off-the-shelf hardware and software products.

See *cast vote record*.

**D****data accuracy**

(1) Data accuracy is defined in terms of ballot position error rate. This rate applies to the voting functions and supporting equipment that capture, record, store, consolidate and report the specific selections, and absence of selections, made by the voter for each ballot position.

(2) The system's ability to process voting data absent internal errors generated by the system. It is distinguished from data integrity, which encompasses errors introduced by an outside source.

**data integrity**

Invulnerability of the system to accidental intervention or deliberate, fraudulent manipulation that would result in errors in the processing of data. It is distinguished from data accuracy that encompasses internal, system-generated errors.

**decertification**

Revocation of national or state certification of voting system hardware and software.

**decryption**

Process of changing encrypted text into plain text.

**device**

Functional unit that performs its assigned tasks as an integrated whole.

**digital signature**

An asymmetric key operation where the private key is used to digitally sign an electronic document and the public key is used to verify the signature. Digital signatures provide data authentication and integrity protection.

**direct-recording electronic (DRE) voting system**

An electronic voting system that utilizes electronic applications for the functions of ballot presentation, vote capture, vote recording, and tabulation which are logically and physically integrated into a single unit. A DRE produces a tabulation of the voting data stored in a removable memory component and in printed hard copy.

**directly verifiable**

Voting system feature that allows the voter to verify at least one representation of his or her ballot with his/her own senses, not using any software or hardware intermediary. Examples include a mark-sense paper ballot and a DRE with a voter verifiable paper record feature.

**disability**

With respect to an individual, a disability is a physical or mental impairment that substantially limits one or more of the major life activities of such individual, with a record of such an impairment as per the definition from the Americans with Disabilities Act.

**dynamic voting system software**

Software that changes over time once it is installed on the voting equipment. See also [voting system software](#).

**DRE**

Direct-Record Electronic. A voting system that records votes by means of a ballot display provided with mechanical or electro-optical applications that can be activated by the voter; that processes data by means of a computer program; and that records voting data and ballot images in memory applications. A DRE produces a tabulation of the voting data stored in a removable memory component and as printed copy.

## E

**EAC Election Day**

Election Assistance Commission ([www.eac.gov](http://www.eac.gov))

**early voting**

Voting conducted before Election Day where the voter completes the ballot in person at a county office or other designated polling place or ballot drop site prior to Election Day.

**election**

A formal process of selecting a person for public office or of accepting or rejecting a political proposition by voting.

**election databases**

Data file or set of files that contain geographic information about political subdivisions and boundaries, all contests and questions to be included in an election, and the candidates for each contest.

**election definition**

Definition of the contests and questions that will appear on the ballot for a specific election; reviewed, tested, and locked to further changes in Build.

**election district**

Contiguous geographic area represented by a public official who is elected by voters residing within the district boundaries. The district may cover an entire state or political subdivision, may be a portion of the state or political subdivision, or may include portions of more than one political subdivision.

**election management system (EMS)**

Set of processing functions and databases within a certified voting system that defines, develops, and maintains election databases, performs election definition and setup functions, formats ballots, counts votes, consolidates and reports results, and maintains audit trails.

**election officials**

The people associated with administering and conducting elections, including government personnel and poll workers.

### **Election Preferences Profile**

A profile that retains jurisdiction-specific preferences concerning election rules and settings. The purpose of the profile is to minimize a user's need to keep re-entering data that is applicable to most of the user's elections. Information stored in an election preferences profile typically does not change frequently, and the profile is user-editable.

### **election programming**

Process by which election officials or their designees use voting system software to logically define the ballot for a specific election.

### **electronic cast vote record**

An electronic version of the cast vote record.

### **electronic voter interface**

Subsystem within a voting system which communicates ballot information to a voter in video, audio or other alternative format which allows the voter to select candidates and issues by means of vocalization or physical actions

### **electronic voting machine**

Any system that utilizes an electronic component. Term is generally used to refer to Direct-Record Electronics (DREs). See also [voting equipment](#), [voting system](#).

### **electronic voting system**

An electronic voting system is one or more integrated devices that utilize an electronic component for one or more of the following functions: ballot presentation, vote capture, vote recording, and tabulation. A DRE is a functionally and physically integrated electronic voting system which provides all four functions electronically in a single device. An optical scan (also known as mark-sense) system where the voter marks a paper ballot with a marking instrument and then deposits the ballot in a tabulation device is partially electronic in that the paper ballot provides the presentation, vote capture and vote recording functions. An optical scan system employing a ballot marking device adds a second electronic component for ballot presentation and vote capture functions.



**encryption**

Process of obscuring information by changing plain text into ciphertext for the purpose of security or privacy. See also [cryptography](#) and [decryption](#).

**error correcting code**

Coding system that allows data being read or transmitted to be checked for errors and, when detected, corrects those errors.

**EAC**

Election Assistance Commission (EAC). Federal agency created by HAVA chartered with, among other things, overseeing the testing and certification of voting systems.

**EDM**

Election Data Management (EDM). Verity Election Office module used to manage data such as election types, contest information, voting logic, audio recordings, and multi-language data.

**Election Preferences Profile**

A profile that retains jurisdiction-specific preferences concerning election rules and settings. The purpose of the profile is to minimize a user's need to keep re-entering data that is applicable to most of the user's elections. Information stored in an election preferences profile typically does not change frequently, and the profile is user-editable.

**EMS**

See election management system (EMS).

**F****Federal Information Processing Standards**

Standards for federal computer systems developed by NIST. These standards are developed when there are no existing industry standards to address federal requirements for system interoperability, portability of data and software, and computer security.

**firmware**

Computer programming stored in programmable read-only memory thus becoming a permanent part of the computing device. It is created and tested like software.

**Functional Configuration Audit (FCA)**

Exhaustive verification of every system function and combination of functions cited in the vendor's documentation. The FCA verifies the accuracy and completeness of the system's Voter Manual, Operations Procedures, Maintenance Procedures, and Diagnostic Testing Procedures.

**functional test**

Test performed to verify or validate the accomplishment of a function or a series of functions.

**G****general election**

Election in which voters, regardless of party affiliation, are permitted to select candidates to fill public office and vote on ballot issues.

**guidelines**

See [product standard](#).

**GUI**

Graphic User Interface (GUI). The human-computer interface in software applications.

**H****hash**

Algorithm that maps a bit string of arbitrary length to a fixed-length bit string.

**hash function**

A function that maps a bit string of arbitrary length to a fixed length bit string. Approved hash functions satisfy the following properties:

1. (One-way) It is computationally infeasible to find any input that maps to any prespecified output.
2. (Collision resistant) It is computationally infeasible to find any two distinct inputs that map to the same.

**I**

**indirectly verifiable**

Voting system feature that allows a voter to verify his or her selections via a hardware or software intermediary. An example is a touch screen DRE where the voter verifies the ballot selections through the assistance of audio stimuli.

**implementation statement**

Also known as implementation conformance statement, this is the statement by a vendor indicating the capabilities, features, and optional functions as well as extensions that have been implemented.

**Independent Testing Authority (ITA)**

Replaced by “accredited testing laboratories” and “test labs.” Prior usage referred to independent testing organizations accredited by the National Association of State Election Directors (NASSED) to perform voting system qualification testing.

**information security**

Protecting information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction in order to provide integrity, confidentiality, and availability.

**inspection**

Examination of a product design, product, process or installation and determination of its conformity with specific requirements or, on the basis of professional judgment, with general requirements. Inspection of a process may include inspection of staffing, facilities, technology and methodology.

**integrity**

Guarding against improper information modification or destruction, and ensuring information non-repudiation and authenticity.

**J**

## **JDM**

Jurisdiction Data Management. Verity Election Office module used to associate politically significant geographic units with specific variable data. For Verity 1.0, JDM requirements are not defined, as any jurisdiction information relevant to a specific election will be managed through EDM.

## **K**

### **key management**

Activities involving the handling of cryptographic keys and other related security parameters (e.g., passwords) during the entire life cycle of the keys, including their generation, storage, establishment, entry and output, and zeroization.

## **L**

### **logic and accuracy testing**

Testing of the tabulator setups of a new election definition to ensure that the content correctly reflects the election being held (that is, contests, candidates, number to be elected, ballot styles) and that all voting positions can be voted for the maximum number of eligible candidates and that results are accurately tabulated and reported.

### **logical correctness**

Condition signifying that, for a given input, a computer program will satisfy the program specification and produce the required output.

## **M**

### **mark-sense**

System by which votes are recorded by means of marks made in voting response fields designated on one or both faces of a ballot card or series of cards. Mark-sense systems may use an optical scanner or similar sensor to read the ballots. Also known as optical scan.

**measure register**

Record that reflects the total votes cast for and against a specific ballot issue. This record is augmented as each ballot is cast on a DRE or as digital signals from the conversion of voted paper ballots are logically interpreted and recorded.

**mechanical lever voting machine**

Machine that directly records a voter's choices via mechanical lever-actuated controls into a counting mechanism that tabulates the votes without using a physical ballot.

**module**

A module is a bounded, self-contained, complete set of user defined functionality and is likely to be involved multiple layers of the architecture.

**multi-seat contest**

Contest in which multiple candidates can run, up to a specified number of seats. Voters may vote for no more than the specified number of candidates.

**MRD**

Market Requirements Document (MRD) articulating the market opportunity, requirements, business justification for pursuing it and the required solution to exploit it.

## N

**NASED**

National Association of State Election Directors, ([www.nased.org](http://www.nased.org))

**national certification testing**

Examination and testing of a voting system to determine if the system complies with the performance and other requirements of the national certification standards and with its own specifications.

**national certification test report**

Report of results of independent testing of a voting system by an accredited test lab delivered to the EAC with a recommendation regarding granting a certification number.

**NIST**

National Institute of Standards and Technology (NIST)

**non-partisan office**

Elected office for which candidates run without political party affiliation.

**nonvolatile memory**

Memory in which information can be stored indefinitely with no power applied. ROMs and PROMs are examples of nonvolatile memory.

**NVLAP**

The National Voluntary Laboratory Accreditation Program (NVLAP) operated by NIST.

**O**

**open primary**

Primary election in which any voters can participate, regardless of their political affiliation. Some states require voters to publicly declare their choice of party ballot at the polling place, after which the poll worker provides or activates the appropriate ballot. Other states allow the voters to make their choice of party ballot within the privacy of the voting booth.

**operational environment**

All software, hardware (including facilities, furnishings and fixtures), materials, documentation, and the interface used by the election personnel, maintenance operator, poll worker, and voter, required for voting equipment operations.

**optical scan, optical scan system**

System by which votes are recorded by means of marks made in voting response fields designated on one or both faces of a ballot card or series of cards. An optical scan system reads and tabulates ballots, usually paper ballots, by scanning the ballot and interpreting the contents. Also known as mark-sense.

## P

**overvote**

An overvote is an abundance of vote options over the allowed limit for the race, such as voting for two candidates in the same race. This amount is used with undervotes to determine the accuracy of voting.

**paper-based voting system**

Voting system that records votes, counts votes, and tabulates the vote count, using one or more ballot cards or paper ballots.

**paper record**

Paper cast vote record that can be directly verified by a voter. See also ballot image, cast vote record.

**partisan office**

An elected office for which candidates run as representatives of a political party.

**personal assistive device**

A device that is carried or worn by an individual with some physical impairment whose primary purpose is to help compensate for that impairment.

**Physical Configuration Audit (PCA)**

Inspection by an accredited test laboratory that compares the voting system applications submitted for certification testing to the vendor's technical documentation and confirms that the documentation submitted meets the national certification requirements. Includes witnessing of the build of the executable system to ensure that the certified release is built from the tested applications.

**political subdivision**

Any unit of government, such as counties and cities, school districts, and water and conservation districts having authority to hold elections for public offices or on ballot issues.

**polling location**

Physical address of a polling place.

**polling place**

Facility to which voters are assigned to cast in-person ballots.

**precinct**

Election administration division corresponding to a contiguous geographic area that is the basis for determining which contests and issues the voters legally residing in that area are eligible to vote on.

**precinct count**

Counting of ballots in the same precinct in which those ballots have been cast.

**precinct count voting system**

A voting system that tabulates ballots at the polling place. These systems typically tabulate ballots as they are cast and print the results after the close of polling. For DREs, and for some paper-based systems, these systems provide electronic storage of the vote count and may transmit results to a central location over public telecommunication networks.

**precision**

(1) Extent to which a given set of measurements of the same sample agree with their mean. Thus, precision is commonly taken to be the standard deviation estimated from sets of duplicate measurements made under conditions of repeatability, that is, independent test results obtained with the same method on identical test material, in the same laboratory or test facility, by the same operator using the same equipment within short intervals of time.

(2) Degree of refinement in measurement or specification, especially as represented by the number of digits given.

**primary election**

Election held to determine which candidate will represent a political party for a given office in the general election. Some states have an open primary, while others have a closed primary. Sometimes elections for nonpartisan offices and ballot issues are held during primary elections.

**primary presidential delegation nomination**

Primary election in which voters choose the delegates to the presidential nominating conventions allotted to their states by the national party committees.



**privacy**

The ability to prevent others from determining how an individual voted.

**private key**

The secret part of an asymmetric key pair that is typically used to digitally sign or decrypt data.

**product standard**

Standard that specifies requirements to be fulfilled by a product or a group of products, to establish its fitness for purpose.

**provisional ballot**

Ballot provided to individuals who claim they are registered and eligible to vote but whose eligibility or registration status cannot be confirmed when they present themselves to vote. Once voted, such ballots must be kept separate from other ballots and are not included in the tabulation until after the voter's eligibility is confirmed. In some jurisdictions called an affidavit ballot. See also [challenged ballot](#).

**public key**

Public part of an asymmetric key pair that is typically used to verify digital signatures or encrypt data.

**public network direct-recording electronic (DRE) voting system**

A DRE that transmits vote counts to a central location over a public telecommunication network.

**PPM**

Polling Place Data Management. Verity Election Office module used to manage data such as polling place names polling place facility information. For Verity 1.0, PPM requirements are not defined, as any polling-place information relevant to a specific election will be managed through EDM. In future versions of Verity, PPM may manage data that is not election specific, such as facility information, poll workers associated with polling places, and so forth.

**PRD**

Product Requirements Document (this document) follows an MRD and specifies use cases, functional and non-functional requirements for a system component.

## Q

### **qualification number**

A number issued by NASED (National Association of State Election Directors) to a system that has been tested by an accredited Independent Testing Authority for compliance with the voting system standards. Issuance of a qualification number indicates that the system conforms to the national standards.

### **qualification test report**

Report of results of independent testing of a voting system by an Independent Test Authority documenting the specific system configuration tested, the scope of tests conducted and when testing was completed.

### **qualification testing**

Examination and testing of a voting system by a NASED-accredited Independent Test Authority to determine if the system conforms to the performance and other requirements of the national certification standards and the vendor's own specifications.

## R

### **ranked order voting**

Practice that allows voters to rank candidates in a contest in order of choice 1, 2, 3 and so on. A candidate receiving a majority of the first choice votes wins that election. If no candidate receives a majority, the last place candidate is deleted, and all ballots are counted again, with each ballot cast for the deleted candidate applied to the next choice candidate listed on the ballot. The process of eliminating the last place candidate and recounting the ballots continues until one candidate receives a majority of the vote. The practice is also known as instant runoff voting, preferences or preferential voting, or choice voting.

**recall issue with options**

Process that allows voters to remove elected representatives from office prior to the expiration of their terms of office. The recall may involve not only the question of whether a particular officer should be removed, but also the question of naming a successor in the event that there is an affirmative vote for the recall.

**recertification**

Re-examination, and possibly retesting of a voting system that was modified subsequent to receiving national and/or state certification. The object of is to determine if the system as modified still conforms to the requirements.

**recount**

Retabulation of the votes cast in an election.

**referendum**

Process whereby a state law or constitutional amendment may be referred to the voters before it goes into effect.

**reproducibility**

Ability to obtain the same test results by using the same test method on identical test items in different testing laboratories with different operators using different equipment.

**requirement**

Provision that conveys criteria to be fulfilled.

**residual vote**

Total number of votes that cannot be counted for a specific contest. There may be multiple reasons for residual votes (such as declining to vote for the contest, overvoting in a contest).

**risk assessment**

The process of identifying the risks to system security and determining the probability of occurrence, the resulting impact, and safeguards that would mitigate this impact.

**runoff election**

Election to select a winner following a primary or a general election, in which no candidate in the contest received the required minimum percentage of the votes cast. The two candidates receiving the most votes for the contest in question proceed to the runoff election.

## S

### **secure receptacle**

The container for storing VVPAT paper audit records.

### **security analysis**

An inquiry into the potential existence of security flaws in a voting system. Includes an analysis of the system's software, firmware, and hardware, as well as the procedures associated with system development, deployment, operation and management.

### **security controls**

Management, operational, and technical controls (such as safeguards or countermeasures) prescribed for an information system to protect the confidentiality, integrity, and availability of the system and its information.

### **semi-static voting system software**

Software that may change in response to the voting equipment on which it is installed or to election-specific programming.

### **Smart clients**

Smart clients are easily deployed and managed client applications that provide an adaptive, responsive and rich interactive experience by leveraging local resources and intelligently connecting to distributed data sources.

### **split precinct**

A precinct that contains an election district subdivision, e.g., a water district or school board district, requiring an additional ballot configuration spoiled ballot.

### **Software Independent System**

A voting system in which independent verification is facilitated by producing multiple records of ballot selections that can be audited to a high level of precision. At least two records of voter selections are produced with one stored such that it cannot be modified by the voting system and where the verification process for each is independent of the other and at least one of the records is verified directly by the voter.

**state certification**

State examination and possibly testing of a voting system to determine its compliance with state requirements for voting systems.

**static voting system software**

Software that does not change based on the election being conducted or the voting equipment upon which it is installed such as executable code for straight party voting.

**symmetric (secret) encryption algorithm**

Encryption algorithms using the same secret key for encryption and decryption.

**system audit log**

Captures system-specific information, such as operating system login or logout and operating system alerts, faults, and failures (that is, running on battery).

**Software Independent System**

A voting system in which independent verification is facilitated by producing multiple records of ballot selections that can be audited to a high level of precision. At least two records of voter selections are produced with one stored such that it cannot be modified by the voting system and where the verification process for each is independent of the other and at least one of the records is verified directly by the voter.

**T****tabulation**

Process of totaling votes. See also [count](#).

**t-coil**

Inductive coil used in some hearing aids to allow reception of an audio band magnetic field signal, instead of an acoustic signal. The magnetic or inductive mode of reception is commonly used in conjunction with telephones, auditorium loop systems and other systems that provide the required magnetic field output.

**tabulator**

Device that counts votes.

**technical data package**

Vendor documentation relating to the voting system required to be submitted with the system as a precondition of certification testing.

**telecommunications**

Transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.

**test**

Technical operation that consists of the determination of one or more characteristics of a given product, process or service according to a specified procedure.

**test campaign**

Sum of the work by a voting system test lab on a single product or system from contract through test plan, conduct of testing for each requirement (including hardware, software, and systems), reporting, archiving, and responding to issues afterwards.

**testing standard**

Standard that is concerned with test methods, sometimes supplemented with other provisions related to testing, such as sampling, use of statistical methods or sequence of tests.

**test method**

Specified technical procedure for performing a test.

**test plan**

Document created prior to testing that outlines the scope and nature of testing, items to be tested, test approach, resources needed to perform testing, test tasks, risks and schedule.

**touch screen voting machine**

A voting machine that utilizes a computer screen to display the ballot and allows the voter to indicate his or her selections by touching designated locations on the screen.

## U

**undervote**

Occurs when the number of choices selected by a voter in a contest is less than the maximum number allowed for that contest or when no selection is made for a single choice contest. This amount is used with overvotes to determine the accuracy of voting.

**usability**

Effectiveness, efficiency and satisfaction with which a specified set of users can achieve a specified set of tasks in a particular environment. Usability in the context of voting refers to voters being able to cast valid votes as they intended quickly, without errors, and with confidence that their ballot choices were recorded correctly. It also refers to the usability of the setup and operation in the polling place of voting equipment.

**usability testing**

Encompasses a range of methods that examine how users in the target audience actually interact with a system, in contrast to analytic techniques such as usability inspection.

## V

**valid vote**

Vote from a ballot or ballot image that is legally acceptable according to state law

**validation**

Process of evaluating a system or component during or at the end of the development process to determine whether it satisfies specified requirements verification

**Verity Access**

Verity's Audio-Tactile Interface device.

**Verity Build**

Verity ballot production software. Build allows you to review and proof elections, create ballots and generate media for running the elections.

**Verity Central**

Verity vote resolution software. Central processes high volumes of paper ballot scanning to compile and send to Verity Count for tabulation and results. These results can be

**Verity Controller**

Verity's polling place controlling device that provide election officials to control a daisy-chained configuration.

**Verity Count**

Verity vote tabulation software. Count receives, reads, aggregates and reports on election results. The system analyzes results, providing deeper details based on specified options such as the types of votes and elections.

**Verity Key**

Verity election crypto module.

**Verity Print**

Verity polling place ballot on demand device. Ballot provides an interface for preparing ballots for use, including configurations, internationalization, recording audio for disabilities and exporting ballots.

**Verity Relay**

Verity election data transmission software. Relay provides remote transmission of election results through a series of sending stations connected to a receiving station. All collected results are delivered to Verity Count for faster submission and tabulation.

**Verity Scan**

Verity polling place scanning device. These devices scan physical printed and marked ballots for collecting and tabulating votes.

**Verity Touch**

Verity polling place direct recording electronics (DRE) device.

**Verity Touch Writer**

Verity polling place ballot marking device, with print capabilities for paper ballots.

**Verity vDrive**

Electronic media for transferring election definitions, election data, and s; provides an method to transfer information over an air gap between systems.



**video ballot**

Electronic voter interface which presents ballot information and voting instructions as video images. See also [ballot](#).

**vote for N of M**

A ballot choice in which voters are allowed to vote for a specified number ("N") of candidates in a multi-seat ("M") contest.

**voted ballot**

Ballot that contains all of a voter's selections and has been cast.

**voter verifiable**

A voting system feature that provides the voter an opportunity to verify that his or her ballot selections are being recorded correctly, before the ballot is cast.

**voter verifiable audit record**

Human-readable printed record of all of a voter's selections presented to the voter to view and check for accuracy.

**voting equipment**

All devices, including the voting machine, used to display the ballot, accept voter selections, record voter selections, and tabulate the votes.

**voting machine**

The mechanical, electromechanical and electric applications of a voting system that the voter uses to view the ballot, indicate their selections, verify their selections. In some instances, the voting machine also casts and tabulates the votes. See [voting equipment](#).

**voting officials**

Term used to designate the group of people associated with elections, including election personnel, poll workers, ballot designers and those responsible for the installation, operation and maintenance of the voting systems.

**voting position**

Specific response field on a ballot where the voter indicates the selection of a candidate or ballot proposition response.

**voting station**

The location within a polling place where voters may record their votes. A voting station includes the area, location, booth or enclosure where voting takes place as well as the voting machine. See [voting machine](#).

**voting system**

The total combination of mechanical, electromechanical or electronic equipment (including the software, firmware, and documentation required to program, control, and support the equipment) that is used to define ballots, cast and count votes, report or display election results; and to maintain and produce any audit trail information; and the practices and associated documentation used to identify system applications and versions of such applications; to test the system during its development and maintenance; to maintain records of system errors and defects; to determine specific system changes to be made to a system after the initial qualification of the system; and to make available any materials to the voter (such as notices, instructions, forms or paper ballots).

**voting system software**

All the executable code and associated configuration files needed for the proper operation of the voting system. This includes third party software such as operating systems, drivers, and database management tools. See also [dynamic voting system software](#), [semi-static voting system software](#), and [static voting system software](#).

**voting system testing**

Examination and testing of a computerized voting system by using test methods to determine if the system complies with the requirements in the Voluntary Voting System Guidelines and with its own specifications.

**voting system test laboratory**

Test laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) to be competent to test voting systems. When NVLAP has completed its evaluation of a test lab, the Director of NIST will forward a recommendation to the EAC for the completion of the accreditation process.

**VSTL**

Voting System Test Laboratory. Independent non-federal test laboratory accredited by the Election Assistance Commission and qualified to test voting systems to approved voting system standards.

**VVPAT**

Voter-Verifiable Paper Audit Trail. Human-readable printed record of all voter selections presented to the voter to review and check for accuracy.

**VVSG**

Voluntary Voting System Guidelines. Standards created by the National Institute of Science and Technology and used by the EAC to test and certify voting systems.

**W****write-in voting**

To make a selection of an individual not listed on the ballot. In some jurisdictions, voters may do this by using a marking device to physically write their choice on the ballot or they may use a keypad, touch screen or other electronic means to enter the name.

**WYSIWYG**

What You See Is What You Get. Term used to describe a visual method of rendering ballot styles, to see an accurate representation of how ballots are laid out. As used in Verity PRDs, WYSIWYG refers to rendering only, and not to edit functions.



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