

# Software QA Checklists

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This document includes a variety of checklists that we use to guide and document structured software QA.

[Integration Testing](#)

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## Integration Testing

### *VxAdmin*

- ☐ Configure with an election package
- ☐ Program smart cards
  - ☐ Sys admin card
  - ☐ Election manager card
  - ☐ Poll worker card
- ☐ Lock machine
- ☐ Can't unlock with poll worker card
- ☐ Unlock with sys admin card, only with the correct PIN
- ☐ Unlock with election manager card, only with the correct PIN
- ☐ Save signed election package

### *VxMark*

- ☐ Unlock with sys admin card to sys admin screen
- ☐ Configure with election manager card and signed election package
- ☐ Stay in test mode
- ☐ Open polls with poll worker card
- ☐ Mark and cast a ballot (more cases will be covered in official mode)
- ☐ Close polls with poll worker card
- ☐ Unlock with election manager card and switch to official mode
  - ☐ Scanned ballot count is reset

- ☐ Opening printer-scanner cover does not trigger alarm
- ☐ Open polls with poll worker card
- ☐ Mark ballots
  - ☐ Ballot without write-in
  - ☐ Ballot with write-in
  - ☐ Blank ballot
  - ☐ Ballot with undervote
  - ☐ Attempt to overvote
  - ☐ Edit selections on review screen
- ☐ Choose to cast ballot at review step
- ☐ Choose to reject ballot at review step
- ☐ Rescan flow
  - ☐ Remove ballot during review step
  - ☐ Re-insert ballot and choose to cast
  - ☐ Re-insert ballot and choose to reject
- ☐ Opening printer-scanner cover triggers alarm
  - ☐ Alarm plays through speaker, whether headphones are connected or not
- ☐ Peripherals
  - ☐ Audio plays through headphones when headphones are connected
  - ☐ Audio does not play through speaker when headphones are not connected
  - ☐ Accessible controller works
  - ☐ PAT input works
- ☐ Close polls with poll worker card
- ☐ Opening printer-scanner cover does not trigger alarm

#### *VxScan*

- ☐ Unlock with sys admin card to sys admin screen
- ☐ Configure with election manager card and signed election package
- ☐ Remove election manager card without selecting a precinct and verify that you see “no precinct selected” screen
- ☐ Unlock with election manager card and select precinct
- ☐ Stay in test mode
- ☐ Open polls with poll worker card
- ☐ Print an additional polls open report
- ☐ Verify polls open report
  - ☐ Contains all contests
  - ☐ Contains 0 tallies for all contests
- ☐ Scan a few HMP ballots (more cases will be covered in official mode)
  - ☐ Test ballot is accepted

- ☐ Official ballot is rejected
- ☐ Scan a few BMD ballots (more cases will be covered in official mode)
  - ☐ Test ballot is accepted
  - ☐ Official ballot is rejected
- ☐ Close polls with poll worker card
- ☐ Print an additional polls close report
- ☐ Verify polls close report
  - ☐ Contains all contests
  - ☐ Contains correct tallies for all contests
- ☐ Unlock with election manager card and switch to official mode
  - ☐ Tallies are reset
- ☐ Scan HMP ballots
  - ☐ All orientations
  - ☐ Official ballot is accepted
  - ☐ Test ballot is rejected
  - ☐ Ballot without write-ins
  - ☐ Ballot with write-ins
    - ☐ All orientations
  - ☐ Ballots that should be marked for adjudication by the current election definition surface a warning
    - ☐ Blank ballots
    - ☐ Overvotes
    - ☐ Undervotes
    - ☐ Choosing to cast as is counts the ballot, i.e., test that an overvote is in the in the final VxAdmin tally
    - ☐ Choosing not to cast the ballot does not count the ballot, i.e., test that an overvote is not in the final VxAdmin tally
- ☐ Scan BMD ballots
  - ☐ All orientations
  - ☐ Official ballot is accepted
  - ☐ Test ballot is rejected
  - ☐ Ballot without write-ins
  - ☐ Ballot with write-ins
    - ☐ All orientations
  - ☐ Ballots that should be marked for adjudication by the current election definition surface a warning
    - ☐ Blank ballots
    - ☐ Undervotes
    - ☐ Choosing to cast as is counts the ballot
    - ☐ Choosing not to cast the ballot does not count the ballot

- ☐ Close polls with poll worker card
- ☐ Print an additional polls close report
- ☐ Verify polls close report
  - ☐ Contains all contests
  - ☐ Contains correct tallies for all contests

#### *VxCentralScan*

- ☐ Can't unlock with poll worker card
- ☐ Unlock with sys admin card to sys admin screen
- ☐ Unlock with election manager card to election manager screen
- ☐ Configure with signed election package
- ☐ Stay in test mode
- ☐ Scan a few HMP ballots (more cases will be covered in official mode)
  - ☐ Test ballot is accepted
  - ☐ Official ballot is rejected
- ☐ Scan a few BMD ballots (more cases will be covered in official mode)
  - ☐ Test ballot is accepted
  - ☐ Official ballot is rejected
- ☐ Export CVRs
- ☐ Switch from test to official mode
  - ☐ Ballots are cleared
  - ☐ Can't export CVRs because there are none to export
- ☐ Scan HMP ballots
  - ☐ Official ballot is accepted
  - ☐ Test ballot is rejected
  - ☐ Ballot without write-ins
  - ☐ Ballot with write-ins
    - ☐ All orientations
  - ☐ Ballots that should be marked for adjudication by the current election definition are paused on
    - ☐ Blank ballots
    - ☐ Overvotes
    - ☐ Undervotes
    - ☐ Choosing to tabulate as is counts the ballot, i.e., test that an overvote is in the in the final VxAdmin tally
    - ☐ Choosing to remove the ballot does not count the ballot, i.e., test that an overvote is not in the final VxAdmin tally
- ☐ Scan BMD ballots
  - ☐ Official ballot is accepted

- ☐ Test ballot is rejected
- ☐ Ballot without write-ins
- ☐ Ballot with write-ins
  - ☐ All orientations
- ☐ No adjudication of BMD ballots on VxCetralScan
  - ☐ Blank ballots → No pause
  - ☐ Undervotes → No pause
- ☐ Delete a batch
- ☐ Export CVRs
- ☐ Export backup

#### *VxAdmin*

- ☐ Import CVRs
  - ☐ Once test mode CVRs are imported, official mode CVRs are not presented for import
  - ☐ Once official mode CVRs are imported, test mode CVRs are not presented for import
  - ☐ Import CVRs from VxScan
  - ☐ Import CVRs from VxCentralScan
- ☐ View unofficial full election tally report and verify that tally is correct
- ☐ Write-in adjudication
  - ☐ Write-ins are populated in the Write-Ins tab
  - ☐ Images are cropped appropriately
  - ☐ After adjudicating a write-in as an official candidate, the tally report reflects the change
  - ☐ After adjudicating a write-in as a non-official candidate, the write-in adjudication report reflects the change, and the tally report buckets under a generic write-in category
  - ☐ HMP ballot write-ins
  - ☐ BMD ballot write-ins
- ☐ View unofficial full election tally report and verify that tally is correct after write-in adjudication
- ☐ Add manual tallies
- ☐ View unofficial full election tally report and verify that tally is correct after manual tally entry
- ☐ View other tally report breakdowns
- ☐ Mark tally as official

#### *All machines*

- ☐ Unlock with vendor card, only with the correct PIN
- ☐ Boot to vendor menu
- ☐ Boot to app

- ☐ Signed Hash Validation
- ☐ Diagnostics

## System Settings Testing

### *Auth settings*

- ☐ arePollWorkerCardPinsEnabled = true (non-default value)
- ☐ inactiveSessionTimeLimitMinutes = non-default value
- ☐ numIncorrectPinAttemptsAllowedBeforeCardLockout = non-default value
- ☐ overallSessionTimeLimitHours = non-default value
- ☐ startingCardLockoutDurationSeconds = non-default value

### *Adjudication settings*

		VxCentralScan	VxScan
Blank ballot	On	<input type="checkbox"/>	<input type="checkbox"/>
	Off	<input type="checkbox"/>	<input type="checkbox"/>
Overvote	On	<input type="checkbox"/>	<input type="checkbox"/>
	Off	<input type="checkbox"/>	<input type="checkbox"/>
Disallow casting overvotes	On	<input type="checkbox"/>	<input type="checkbox"/>
	Off	<input type="checkbox"/>	<input type="checkbox"/>
Undervote	On	<input type="checkbox"/>	<input type="checkbox"/>
	Off	<input type="checkbox"/>	<input type="checkbox"/>
Unmarked write-in	On	<input type="checkbox"/>	<input type="checkbox"/>
	Off	<input type="checkbox"/>	<input type="checkbox"/>

### *Miscellaneous settings*

- ☐ precinctScanEnableShoeshineMode = true
- ☐ castVoteRecordsIncludeOriginalSnapshots = true
- ☐ castVoteRecordsIncludeRedundantMetadata = true
- ☐ disableVerticalStreakDetection = true

# Election/Ballot Variety Testing

- ☐ General
- ☐ Primary
  - ☐ With some non-partisan candidate contests
  - ☐ With some ballot measures
- ☐ All-bubble
- ☐ NH test with timing-mark metadata instead of QR-code metadata
  - ☐ Doubly-endorsed candidates
- ☐ Maximal election, with high contest/candidate counts and long strings
- ☐ Different precinct arrangements
  - ☐ Single precinct
  - ☐ Multiple precincts, with some contests shared across precincts and others unique to certain precincts
  - ☐ Precinct split
- ☐ HMP ballot lengths
  - ☐ 11"
  - ☐ 14"
  - ☐ 17"
  - ☐ 18"
  - ☐ 21"
  - ☐ 22"
- ☐ Language
  - ☐ Multi-language
  - ☐ Single-language
- ☐ Other contest situations
  - ☐ Vote for N candidate contest
  - ☐ Markdown in ballot measures

# Paper Path Stress Testing

- ☐ VxCentralScan
  - ☐ Jam handling
  - ☐ Folded ballots
  - ☐ All paper lengths per [Election/Ballot Variety Testing](#)
- ☐ VxMark
  - ☐ Jam handling
- ☐ VxScan
  - ☐ Jam handling

- ☐ Folded ballots
- ☐ All paper lengths per [Election/Ballot Variety Testing](#)
- ☐ Ballots inserted with skew
- ☐ Multi-sheet detection
  - ☐ Enabled
  - ☐ Disabled
  - ☐ Calibration
  - ☐ Various paper weights

## VxAdmin Detail Testing

### *Sys admin UI*

- ☐ Can't unlock with election manager card if machine is unconfigured
- ☐ Unlock with sys admin card
- ☐ Settings tab
  - ☐ "Save Log File" works
  - ☐ "Set Date and Time" works
  - ☐ "Format USB" works
  - ☐ "Reboot to BIOS" works
  - ☐ "Signed Hash Validation" works
- ☐ Diagnostics tab
  - ☐ "Print Test Page" is disabled if printer is not connected
  - ☐ "Print Test Page" is enabled if printer is connected
  - ☐ "Print Test Page" works and records if the print was a pass
  - ☐ "Print Test Page" works and records if the print was a fail
  - ☐ All displayed statuses are correct
    - ☐ Configuration status is correct
    - ☐ Power status is correct when connected to charger
    - ☐ Power status is correct when not connected to charger
    - ☐ Storage status is correct
    - ☐ Printer status is correct
  - ☐ "Save Readiness Report" saves data that matches what's shown on screen
- ☐ Configure with an election package using automatically displayed options
- ☐ Unconfigure machine
- ☐ Configure with an election package using "Select Other File..."
- ☐ USB drive status in the top bar is correct
  - ☐ No USB drive
  - ☐ USB drive



- ☐ "Eject USB" works
- ☐ Smart card programming
  - ☐ Can program sys admin card
  - ☐ Can program election manager card
  - ☐ Can program poll worker card
  - ☐ New sys admin card can unlock machine if correct PIN is entered
    - ☐ Card can't unlock machine if incorrect PIN is entered
    - ☐ After fifth incorrect unlock attempt, card is locked, and you have to wait 15 seconds before another entry
    - ☐ After sixth incorrect unlock attempt, card is locked, and you have to wait 30 seconds before another entry
    - ☐ Card can unlock machine if correct PIN is entered after wait time
  - ☐ New election manager card can unlock machine if correct PIN is entered
    - ☐ Card can't unlock machine if incorrect PIN is entered
    - ☐ After fifth incorrect unlock attempt, card is locked, and you have to wait 15 seconds before another entry
    - ☐ After sixth incorrect unlock attempt, card is locked, and you have to wait 30 seconds before another entry
    - ☐ Card can unlock machine if correct PIN is entered after wait time
  - ☐ New poll worker card can't unlock machine
  - ☐ Can reset sys admin card PIN and then unlock machine using that new PIN
  - ☐ Can reset election manager card PIN and then unlock machine using that new PIN
  - ☐ Poll worker card shows no option to reset card PIN
  - ☐ Can't unprogram sys admin card
  - ☐ Can unprogram election manager card programmed for current election
  - ☐ Can unprogram poll worker card programmed for current election
  - ☐ Can unprogram election manager card programmed for another election
  - ☐ Can unprogram poll worker card programmed for another election
- ☐ Lock machine

#### *Election manager UI*

- ☐ Unlock with election manager card
- ☐ Saving signed election package works
- ☐ Settings tab
  - ☐ "Save Log File" works
  - ☐ "Set Date and Time" works
  - ☐ "Signed Hash Validation" works
- ☐ Reports tab shows proper zero reports before CVR import
- ☐ Import CVRs

- ☐ Import modal shows the expected information
- ☐ Import a CVR export using the pre-populated suggestions
- ☐ Import a CVR export using the option to "Select Export Manually..."
- ☐ Once test mode CVRs are imported, official mode CVRs are not presented for import
- ☐ Once official mode CVRs are imported, test mode CVRs are not presented for import
- ☐ Can't import a CVR export from the wrong election
- ☐ Can't import a file/directory that isn't a CVR export
- ☐ Can't import a duplicate CVR export
- ☐ Duplicate ballot IDs are recognized and not imported twice (test by scanning X ballots, exporting CVRs, scanning Y more ballots, exporting CVRs again, importing both CVR exports, and seeing that only X+Y total ballots are imported, not 2X+Y)
- ☐ Write-in adjudication
  - ☐ Write-ins are populated in the Write-Ins tab
  - ☐ Images are cropped appropriately
  - ☐ Zoom in and out
  - ☐ After adjudicating a write-in as an official candidate, the tally report reflects the change
  - ☐ After adjudicating a write-in as a non-official candidate, the write-in adjudication report reflects the change, and the tally report buckets under a generic write-in category
  - ☐ After adjudicating a write-in as invalid, i.e., as an undervote, the write-in adjudication report and tally report update as expected
- ☐ Manual tallies
  - ☐ Manual tallies for official candidates are included in the tally report
  - ☐ Manual tallies for existing write-ins are included in the write-in adjudication report
  - ☐ Manual tallies for new write-ins are included in the write-in adjudication report
  - ☐ Can't repeat a write-in option when adding write-in candidates
- ☐ Reports tab
  - ☐ "Full Election Tally Report" is correct
    - ☐ "Print Report" works
    - ☐ "Export Report PDF" works
    - ☐ "Export Report CSV" works
    - ☐ "Export CDF Report" works
  - ☐ "All Precincts Tally Report" is correct
    - ☐ "Print Report" works
    - ☐ "Export Report PDF" works
    - ☐ "Export Report CSV" works
  - ☐ "Single Precinct Tally Report" is correct for every precinct
    - ☐ "Print Report" works
    - ☐ "Export Report PDF" works

- ☐ "Export Report CSV" works
- ☐ "Precinct Ballot Count Report" is correct
  - ☐ "Print Report" works
  - ☐ "Export Report PDF" works
  - ☐ "Export Report CSV" works
- ☐ "Voting Method Ballot Count Report" is correct
  - ☐ "Print Report" works
  - ☐ "Export Report PDF" works
  - ☐ "Export Report CSV" works
- ☐ "Write-In Adjudication Report" is correct
  - ☐ "Print Report" works
  - ☐ "Export Report PDF" works
- ☐ "Save Tally Report" "Save As..." option works for a PDF report
- ☐ "Save Tally Report" "Save As..." option works for a CSV report
- ☐ "Tally Report Builder" works
  - ☐ "Filters" work
  - ☐ "Report By" works
  - ☐ "Print Report" works
  - ☐ "Export Report PDF" works
  - ☐ "Export Report CSV" works
- ☐ "Ballot Count Report Builder" works
  - ☐ "Filters" work
  - ☐ "Report By" works
  - ☐ "Print Report" works
  - ☐ "Export Report PDF" works
  - ☐ "Export Report CSV" works
- ☐ Mark election results as official
  - ☐ References to "Unofficial" on the page and in PDF and CSV reports switch to "Official"
  - ☐ Can't import new CVR exports
  - ☐ Can't make changes to write-in adjudication
  - ☐ Can't enter manual tallies